(HCVSP) Hepatitis C Antibody with reflex to HCV RT-PCR

ORDERING

Performing Lab:
Immunology

Performed:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Additional Information:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Reflex Testing:
Positive HCV Antibody will automatically reflex to HCVRT test. Additional charge applies.

Synonyms:
- HCV
- Hepatitis C Antibody
- Hepatitis
- anti-HCV antibody
- HCVAB
- Hep C Ab

COLLECTION

Sample Type:
Serum and EDTA Plasma

Collect:
Gold and Pearl White top

Amount to Collect:
1 mL blood for Gold top
8.5 mL blood for Pearl White top

Preferred Volume:
0.5 mL serum and 3 mL plasma

Minimum Volume:
See individual test for details

Rejection Criteria:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

PROCESSING

Test Code:
HCVSP

Performing Lab:
Immunology

Specimen Preparation:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Preferred Volume:
0.5 mL serum and 3 mL plasma

Minimum Volume:
See individual test for details

Rejection Criteria:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

RESULT INTERPRETATION

Additional Information:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

ADMINISTRATIVE

CPT Codes:
HCV - 86803, HCVRT - 87522

LOINC Codes:
HCV - 13955-0, HCVRT - 38180-6

COMPLETE VIEW

Test Code:
HCVSP

Performing Lab:
Immunology

Performed:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Collect:
Gold and Pearl White top

Amount to Collect:
1 mL blood for Gold top
8.5 mL blood for Pearl White top

Sample Type:
Serum and EDTA Plasma

Preferred Volume:
0.5 mL serum and 3 mL plasma

Minimum Volume:
See individual test for details

Rejection Criteria:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Specimen Preparation:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

Synonyms:
- HCV
- Hepatitis C Antibody
- Hepatitis
- anti-HCV antibody
- HCVAB
- Hep C Ab

Reflex Testing:
Positive HCV Antibody will automatically reflex to HCVRT test. Additional charge applies.

Additional Information:
See individual tests - Hepatitis C Antibody (HCV) and Hepatitis C RNA, Quantitative (HCVRT) for additional information

CPT Codes:
HCV - 86803, HCVRT - 87522

LOINC Codes:
HCV - 13955-0, HCVRT - 38180-6
CEBPA Mutation Detection
CEBPAX

ORDERING

Ordering Recommendations:
Initial test for prognostication of CN-AML.

Performed:
DNA isolation: Sun-Sat
Assay: Mon, Wed, Fri

Methodology:
Polymerase Chain Reaction/Sequencing

Reported:
12-14 days

Synonyms:
- CCAAT Enhancer Binding Protein Alpha
- CEBP Alpha
- CEBPA Mutation Analysis

COLLECTION

Collect:
Lavender (EDTA) OR bone marrow (EDTA).

Stability (from collection to initiation):
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

PROCESSING

Test Code:
CEBPAX

ARUP Test Code:
2004247

Specimen Preparation:
Transport 5 mL whole blood (Min: 1 mL) OR 3 mL bone marrow (Min: 1 mL).

Unacceptable Conditions:
Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

Stability (from collection to initiation):
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Interpretive Data:
Refer to report.

Printed 06/07/19
Test information subject to change
CPT Codes:
81218

Ordering Recommendations:
Initial test for prognostication of CN-AML.

Test Code:
CEBPAX

ARUP Test Code:
2004247

Performed:
DNA isolation: Sun-Sat
Assay: Mon, Wed, Fri

Methodology:
Polymerase Chain Reaction/Sequencing

Collect:
Lavender (EDTA) OR bone marrow (EDTA).

Unacceptable Conditions:
Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

Specimen Preparation:
Transport 5 mL whole blood (Min: 1 mL) OR 3 mL bone marrow (Min: 1 mL).

Interpretive Data:
Refer to report.

Synonyms:
- CCAAT Enhancer Binding Protein Alpha
- CEBP Alpha
- CEBPA Mutation Analysis

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Reported:
12-14 days

CPT Codes:
81218
Coccidioides Antigen Quantitative by EIA
COCCA

ORDERING

Performing Lab:
ARUP

Performed:
Varies

Methodology:
Quantitative Enzyme Immunoassay

Reported:
3-8 days

Synonyms:
- Cocci Antigen
- Cocci Ag

COLLECTION

Sample Type:
Urine, serum/plasma, CSF, BAL

Collect:
Urine, Plain Red, Serum Separator Tube (SST), Lavender (EDTA), Pink (K₂EDTA), Green (Sodium or Lithium Heparin), Light Blue (CTAD), CSF or BAL.

Preferred Volume:
Urine and BAL: 1 mL
Serum/plasma: 2 mL
CSF: 1 mL

Minimum Volume:
Urine and BAL: 0.5 mL
Serum/plasma: 1.2 mL
CSF: 0.8 mL

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: Indefinitely

Storage/Transport Temperature:
Refrigerated. Also acceptable: Frozen.

PROCESSING

Test Code:
COCCA

ARUP Test Code:
2011075

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Urine or BAL: Transfer 1 mL urine or BAL to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Serum or Plasma: Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 1.2 mL)
CSF: Transfer 1 mL CSF to an ARUP Standard Transport Tube. (Min: 0.8 mL)

Preferred Volume:
Urine and BAL: 1 mL
Serum/plasma: 2 mL
CSF: 1 mL
Minimum Volume:
- Urine and BAL: 0.5 mL
- Serum/plasma: 1.2 mL
- CSF: 0.8 mL

Stability (from collection to initiation):
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: Indefinitely

Storage/Transport Temperature:
- Refrigerated. Also acceptable: Frozen.

RESULT INTERPRETATION

Reference Interval:
- By Report

ADMINISTRATIVE

CPT Codes:
- 87449
LOINC:
- 31208-2

COMPLETE VIEW

Test Code:
- COCCA
ARUP Test Code:
- 2011075
Performing Lab:
- ARUP
Sendout:
- Yes
Performed:
- Varies
Methodology:
- Quantitative Enzyme Immunoassay
Collect:
- Urine, Plain Red, Serum Separator Tube (SST), Lavender (EDTA), Pink (K₂EDTA), Green (Sodium or Lithium Heparin), Light Blue (CTAD), CSF or BAL.
Sample Type:
- Urine, serum/plasma, CSF, BAL
Preferred Volume:
- Urine and BAL: 1 mL
- Serum/plasma: 2 mL
- CSF: 1 mL
Minimum Volume:
- Urine and BAL: 0.5 mL
- Serum/plasma: 1.2 mL
- CSF: 0.8 mL
Specimen Preparation:
- Urine or BAL: Transfer 1 mL urine or BAL to an ARUP Standard Transport Tube. (Min: 0.5 mL)
- Serum or Plasma: Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 1.2 mL)
- CSF: Transfer 1 mL CSF to an ARUP Standard Transport Tube. (Min: 0.8 mL)
Reference Interval:
- By Report
Synonyms:
- Cocci Antigen
- Cocci Ag

**Storage/Transport Temperature:**
- Refrigerated. Also acceptable: Frozen.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: Indefinitely

**Reported:**
- 3-8 days

**CPT Codes:**
- 87449

**LOINC:**
- 31208-2
**JAK2 Gene, V617F Mutation, Quantitative**

**MOLT**

### ORDERING

**Ordering Recommendations:**
Quantitates JAK2 V617F allele frequency in enriched granulocytes from peripheral whole blood. Aids in risk stratification and therapeutic monitoring of JAK2 V617F mutation positive myeloproliferative neoplasms.

**Performed:**
- DNA isolation: Sun-Sat
- Assay: Mon, Wed, Fri

**Methodology:**
Polymerase Chain Reaction

**Reported:**
7-10 days

**Synonyms:**
- BCR-ABL1-negative testing
- Classic BCR-ABL1-negative MPN testing
- MPN JAK 2
- mutant JAK 2 V617F allelic burden

### COLLECTION

**Collect:**
- Lavender (EDTA).

**Stability (from collection to initiation):**
- Ambient: 24 hours; Refrigerated: 48 hours; Frozen: Unacceptable

**Storage/Transport Temperature:**
Refrigerated.

**Unacceptable Conditions:**
- Bone marrow, serum, or plasma. Frozen or clotted whole blood. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

### PROCESSING

**Test Code:**
- MOLT

**ARUP Test Code:**
- 0040168

**Specimen Preparation:**
- Transport 5 mL whole blood. (Min: 1 mL).

**Unacceptable Conditions:**
- Bone marrow, serum, or plasma. Frozen or clotted whole blood. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

**Stability (from collection to initiation):**
- Ambient: 24 hours; Refrigerated: 48 hours; Frozen: Unacceptable

**Storage/Transport Temperature:**
Refrigerated.

### RESULT INTERPRETATION

**Reference Interval:**
By report

Test information subject to change.
Interpretive Data: Refer to report.

ADMINISTRATIVE

CPT Codes:
81270

COMPLETE VIEW

Ordering Recommendations:
Quantitates JAK2 V617F allele frequency in enriched granulocytes from peripheral whole blood. Aids in risk stratification and therapeutic monitoring of JAK2 V617F mutation positive myeloproliferative neoplasms.

Test Code:
MOLT

ARUP Test Code:
0040168

Performed:
DNA isolation: Sun-Sat
Assay: Mon, Wed, Fri

Methodology:
Polymerase Chain Reaction

Collect:
Lavender (EDTA).

Unacceptable Conditions:
Bone marrow, serum, or plasma. Frozen or clotted whole blood. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

Specimen Preparation:
Transport 5 mL whole blood. (Min: 1 mL).

Reference Interval:
By report

Interpretive Data: Refer to report.

Synonyms:
• BCR-ABL1-negative testing
• Classic BCR-ABL1-negative MPN testing
• MPN JAK 2
• mutant JAK 2 V617F allelic burden

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 24 hours; Refrigerated: 48 hours; Frozen: Unacceptable

Reported:
7-10 days

CPT Codes:
81270
**KIT (D816V) Mutation by PCR**

**ORDERING**

**Ordering Recommendations:**
Aid in the diagnosis of mastocytosis. Provide prognostic and predictive information for tyrosine kinase inhibitor (TKI) therapy planning.

**Performing Lab:**
ARUP

**Performed:**
DNA isolation: Sun-Sat
Assay: Mon, Wed, Fri

**Methodology:**
Polymerase Chain Reaction

**Reported:**
2-7 days

**Synonyms:**
- Asp816Val
- C-KIT
- CKIT
- D816V
- KIT exon 17

**COLLECTION**

**Sample Type:**
Whole blood or bone marrow

**Collect:**
Lavender (EDTA) or bone marrow (EDTA).

**Amount to Collect:**
Whole Blood: 5 mL
Bone Marrow: 3 mL

**Minimum Volume:**
Whole Blood: 1 mL
Bone Marrow: 1 mL

**Stability (from collection to initiation):**
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Storage/Transport Temperature:**
Refrigerated.

**Unacceptable Conditions:**
FFPE tumor tissue. Fresh Tissue. Clotted or grossly hemolyzed specimens.

**PROCESSING**

**Test Code:**
KITD

**ARUP Test Code:**
3000440

**Sendout:**
Yes

**Performing Lab:**
ARUP

**Specimen Preparation:**
Printed 06/07/19
Test information subject to change
Whole Blood: Transport 5 mL whole blood. (Min: 1 mL)
Bone Marrow: Transport 3 mL bone marrow. (Min: 1 mL)

**Minimum Volume:**
- Whole Blood: 1 mL
- Bone Marrow: 1 mL

**Unacceptable Conditions:**
- FFPE tumor tissue. Fresh Tissue. Clotted or grossly hemolyzed specimens.

**Stability (from collection to initiation):**
- Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Storage/Transport Temperature:**
- Refrigerated.

### RESULT INTERPRETATION

**Interpretive Data:**
- Refer to report.

### ADMINISTRATIVE

**CPT Codes:**
- 81273

### COMPLETE VIEW

**Ordering Recommendations:**
- Aid in the diagnosis of mastocytosis. Provide prognostic and predictive information for tyrosine kinase inhibitor (TKI) therapy planning.

**Test Code:**
- KITD

**ARUP Test Code:**
- 3000440

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- DNA isolation: Sun-Sat
- Assay: Mon, Wed, Fri

**Methodology:**
- Polymerase Chain Reaction

**Collect:**
- Lavender (EDTA) or bone marrow (EDTA).

**Amount to Collect:**
- Whole Blood: 5 mL
- Bone Marrow: 3 mL

**Sample Type:**
- Whole blood or bone marrow

**Minimum Volume:**
- Whole Blood: 1 mL
- Bone Marrow: 1 mL

**Unacceptable Conditions:**
- FFPE tumor tissue. Fresh Tissue. Clotted or grossly hemolyzed specimens.

**Specimen Preparation:**
- Whole Blood: Transport 5 mL whole blood. (Min: 1 mL)
- Bone Marrow: Transport 3 mL bone marrow. (Min: 1 mL)

**Interpretive Data:**
- Refer to report.
Refer to report.

**Synonyms:**
- Asp816Val
- C-KIT
- CKIT
- D816V
- KIT exon 17

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Reported:**
2-7 days

**CPT Codes:**
81273
**KIT Mutations in AML by Fragment Analysis and Sequencing**

**KITML**

**ORDERING**

**Ordering Recommendations:**
- Prognostication in core-binding factor-related (CBF) AML.

**Performing Lab:**
- ARUP

**Performed:**
- DNA isolation: Sun-Sat
- Assay: Sun, Tue, Thu

**Methodology:**
- Polymerase Chain Reaction/Fragment Analysis/Sequencing

**Reported:**
- 12-14 days

**Synonyms:**
- CBF AML testing
- CKIT
- Exon 8 and 17
- GST8
- KIT ex 8
- KIT exon 8

**COLLECTION**

**Collect:**
- Lavender (EDTA) or pink (K<sub>2</sub>EDTA). OR bone marrow (EDTA).

**Stability (from collection to initiation):**
- Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Storage/Transport Temperature:**
- Refrigerated.

**Unacceptable Conditions:**
- Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

**PROCESSING**

**Test Code:**
- KITML

**ARUP Test Code:**
- 2002437

**Sendout:**
- Yes

**Performing Lab:**
- ARUP

**Specimen Preparation:**
- Transport 5 mL whole blood (Min: 1 mL) OR 3 mL bone marrow (Min: 1 mL).

**Unacceptable Conditions:**
- Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemolyzed specimens.

**Stability (from collection to initiation):**
- Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable
Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Interpretive Data:
Refer to report.

ADMINISTRATIVE

CPT Codes:
81272

COMPLETE VIEW

Ordering Recommendations:
Prognostication in core-binding factor-related (CBF) AML.

Test Code:
KITML

ARUP Test Code:
2002437

Performing Lab:
ARUP

Sendout:
Yes

Performed:
DNA isolation: Sun-Sat
Assay: Sun, Tue, Thu

Methodology:
Polymerase Chain Reaction/Fragment Analysis/Sequencing

Collect:
Lavender (EDTA) or pink (K$_2$EDTA). OR bone marrow (EDTA).

Unacceptable Conditions:
Serum or plasma. Frozen or clotted specimens. Specimens collected in anticoagulants other than EDTA. Severely hemoloyzed specimens.

Specimen Preparation:
Transport 5 mL whole blood (Min: 1 mL) OR 3 mL bone marrow (Min: 1 mL).

Interpretive Data:
Refer to report.

Synonyms:
• CBF AML testing
• CKIT
• Exon 8 and 17
• GST8
• KIT ex 8
• KIT exon 8

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Reported:
12-14 days
CPT Codes:
81272
Legionella pneumophila Antibody (Types 1-6), IgG by IFA

ORDERING

Ordering Recommendations:
Provide retrospective evidence of suspected Legionella pneumophila infection.

Performing Lab:
ARUP

Performed:
Mon-Fri

Methodology:
Semi-Quantitative Indirect Fluorescent Antibody

Reported:
1-4 days

Synonyms:
- L pneumophila IgG
- L pneumophila Types 1-6 Ab
- Legionella pneumophila IgG antibody
- Legionnaires Disease Testing

COLLECTION

Sample Type:
Serum

Collect:
Serum separator tube.

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Contaminated, hemolyzed, or severely lipemic specimens.

PROCESSING

Test Code:
LEGNG

ARUP Test Code:
0050365

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.1 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens.
Mark specimens plainly as acute or convalescent.

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Unacceptable Conditions:**
- Contaminated, hemolyzed, or severely lipemic specimens.

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
- Refrigerated.

### RESULT INTERPRETATION

**Reference Interval:**
- <1:128 Negative - No significant level of Legionella pneumophila Type 1-6 IgG antibody detected.
- 1:128 Equivocal - Questionable presence of Legionella pneumophila Type 1-6 IgG antibody detected. Repeat testing in 10-14 days may be helpful.
- 1:256 or greater Positive - Presence of Legionella pneumophila Type 1-6 IgG antibody detected, suggestive of current or past infection.

**Interpretive Data:**
- Seroconversion between acute and convalescent sera is considered strong evidence of recent infection. The best evidence for infection is a significant change on two appropriately timed specimens where both tests are done in the same laboratory at the same time. This assay may detect infection by any of the serotypes 1-6. The CDC and many state health laboratories recommend testing only for antibody to Legionella pneumophila Type 1. For equivocal or positive IFA results, the CDC protocol suggests follow-up testing for Legionella pneumophila antibody Type 1.

### ADMINISTRATIVE

**CPT Codes:**
- 86713

**LOINC:**
- 21362-9

### COMPLETE VIEW

**Ordering Recommendations:**
- Provide retrospective evidence of suspected Legionella pneumophila infection.

**Test Code:**
- LEGNG

**ARUP Test Code:**
- 0050365

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon-Fri

**Methodology:**
- Semi-Quantitative Indirect Fluorescent Antibody

**Collect:**
- Serum separator tube.

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum
Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Unacceptable Conditions:
Contaminated, hemolyzed, or severely lipemic specimens.

Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.1 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Mark specimens plainly as acute or convalescent.

Reference Interval:
<1:128 Negative - No significant level of Legionella pneumophila Type 1-6 IgG antibody detected.
1:128 Equivocal - Questionable presence of Legionella pneumophila Type 1-6 IgG antibody detected. Repeat testing in 10-14 days may be helpful.
1:256 or greater Positive - Presence of Legionella pneumophila Type 1-6 IgG antibody detected, suggestive of current or past infection.

Interpretive Data:
Seroconversion between acute and convalescent sera is considered strong evidence of recent infection. The best evidence for infection is a significant change on two appropriately timed specimens where both tests are done in the same laboratory at the same time. This assay may detect infection by any of the serotypes 1-6. The CDC and many state health laboratories recommend testing only for antibody to Legionella pneumophila Type 1. For equivocal or positive IFA results, the CDC protocol suggests follow-up testing for Legionella pneumophila antibody Type 1.

Synonyms:
- L pneumophila IgG
- L pneumophila Types 1-6 Ab
- Legionella pneumophila IgG antibody
- Legionnaires Disease Testing

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
1-4 days

CPT Codes:
86713

LOINC:
- 21362-9

Notes:
For follow-up testing on equivocal or positive results, refer to Legionella pneumophila Antibody (Type 1), IgG by IFA (0050376).
Legionella pneumophila Antibody (Types 1-6), IgM by IFA
LEGNM

ORDERING

Ordering Recommendations:
May be useful when acute legionellosis is suspected; however, Legionella pneumophila Antigen, Urine (0070322) is preferred.

Performing Lab:
ARUP

Performed:
Mon-Fri

Methodology:
Semi-Quantitative Indirect Fluorescent Antibody

Reported:
1-4 days

Synonyms:
• L pneumophila IgM
• L pneumophila Types 1-6 Ab
• Legionella pneumophila IgM antibody
• Legionnaires Disease Testing

COLLECTION

Sample Type:
Serum

Collect:
Serum separator tube.

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Contaminated, heat-inactivated, hemolyzed, or severely lipemic specimens.

PROCESSING

Test Code:
LEGNM

ARUP Test Code:
0050274

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum from cell ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.1 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens.
Mark specimens plainly as acute or convalescent.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.1 mL serum

**Unacceptable Conditions:**
Contaminated, heat-inactivated, hemolyzed, or severely lipemic specimens.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
Refrigerated.

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**RESULT INTERPRETATION**

**Reference Interval:**
<1:16

**Interpretive Data:**
IgM antibody to Legionella pneumophila serotypes 1-6 is measured using an IgM-specific conjugate. It is recommended that the IgM test always be performed in conjunction with IgG antibody test.

The IgM response to Legionella tends to develop concurrently with the IgG response and may remain elevated as long as the IgG response remains elevated. Cross-reactions have been described with several species of bacteria and Mycoplasma.

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**ADMINISTRATIVE**

**CPT Codes:**
86713

**LOINC:**
- 16133-1

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**COMPLETE VIEW**

**Ordering Recommendations:**
May be useful when acute legionellosis is suspected; however, Legionella pneumophila Antigen, Urine (0070322) is preferred.

**Test Code:**
LEGNM

**ARUP Test Code:**
0050274

**Performing Lab:**
ARUP

**Sendout:**
Yes

**Performed:**
Mon-Fri

**Methodology:**
Semi-Quantitative Indirect Fluorescent Antibody

**Collect:**
Serum separator tube.

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum
Minimum Volume:
0.1 mL serum

Unacceptable Conditions:
Contaminated, heat-inactivated, hemolyzed, or severely lipemic specimens.

Specimen Preparation:
Separate serum from cell ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.1 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Mark specimens plainly as acute or convalescent.

Reference Interval:
<1:16

Interpretive Data:
IgM antibody to Legionella pneumophila serotypes 1-6 is measured using an IgM-specific conjugate. It is recommended that the IgM test always be performed in conjunction with IgG antibody test.

The IgM response to Legionella tends to develop concurrently with the IgG response and may remain elevated as long as the IgG response remains elevated. Cross-reactions have been described with several species of bacteria and Mycoplasma.

Synonyms:
- L pneumophila IgM
- L pneumophila Types 1-6 Ab
- Legionella pneumophila IgM antibody
- Legionnaires Disease Testing

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
1-4 days

CPT Codes:
86713

LOINC:
- 16133-1

Test information subject to change
**Leptospira Antibody, IgM by Dot Blot**

**LEPTM**

### ORDERING

**Ordering Recommendations:**
- Aids in the detection of acute leptospirosis.

**Performing Lab:**
- ARUP

**Performed:**
- Mon, Thu

**Methodology:**
- Qualitative Immunoblot

**Reported:**
- 1-5 days

**Synonyms:**
- Leptospira IgM antibody
- Leptospira IgM Dot Blot

### COLLECTION

**Collect:**
- Serum separator tube or green (sodium or lithium heparin).

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
- Refrigerated.

**Unacceptable Conditions:**
- Contaminated, heat-inactivated, hemolyzed, severely lipemic specimens. Any other body fluid.

### PROCESSING

**Test Code:**
- LEPTM

**ARUP Test Code:**
- 0055233

**Sendout:**
- Yes

**Performing Lab:**
- ARUP

**Specimen Preparation:**
- Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.05 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Please mark specimen plainly as acute or convalescent.

**Unacceptable Conditions:**
- Contaminated, heat-inactivated, hemolyzed, severely lipemic specimens. Any other body fluid.

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
- Refrigerated.

### RESULT INTERPRETATION
Reference Interval:

Negative: No significant level of Leptospira IgM antibody detected.
Equivocal: Questionable presence of Leptospira IgM antibody detected. Repeat testing in 10-14 days may be helpful.
Positive: Presence of IgM antibody to Leptospira detected, suggestive of a current or recent infection.

Interpretive Data:

Samples interpreted as negative indicate that antibody is not present in the sample, or is below the detection level of the method. Since antibodies may not be present during early disease, confirmation two to three weeks later is recommended. An initially-negative result followed by a positive result indicates IgM seroconversion.

Equivocal specimens should be cautiously interpreted. Further testing with an additional specimen is recommended. If the specimen remains equivocal, a second serological method should be considered if leptospirosis infection is still suspected.

Samples interpreted as positive may indicate the specific antibody. Antibody presence alone cannot be used for diagnosis of acute infection, however, because antibodies from prior exposure may circulate for a prolonged period of time.

ADMINISTRATIVE

CPT Codes:

86720

COMPLETE VIEW

Ordering Recommendations:

Aids in the detection of acute leptospirosis.

Test Code:

LEPTM

ARUP Test Code:

0055233

Performing Lab:

ARUP

Sendout:

Yes

Performed:

Mon, Thu

Methodology:

Qualitative Immunoblot

Collect:

Serum separator tube or green (sodium or lithium heparin).

Unacceptable Conditions:

Contaminated, heat-inactivated, hemolyzed, severely lipemic specimens. Any other body fluid.

Specimen Preparation:

Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.05 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Please mark specimen plainly as acute or convalescent.

Reference Interval:

Negative: No significant level of Leptospira IgM antibody detected.
Equivocal: Questionable presence of Leptospira IgM antibody detected. Repeat testing in 10-14 days may be helpful.
Positive: Presence of IgM antibody to Leptospira detected, suggestive of a current or recent infection.

Interpretive Data:

Samples interpreted as negative indicate that antibody is not present in the sample, or is below the detection level of the method. Since antibodies may not be present during early disease, confirmation two to three weeks later is recommended. An initially-negative result followed by a positive result indicates IgM seroconversion.

Equivocal specimens should be cautiously interpreted. Further testing with an additional specimen is recommended. If the specimen remains equivocal, a second serological method should be considered if leptospirosis infection is still suspected.

Samples interpreted as positive may indicate the specific antibody. Antibody presence alone cannot be used for diagnosis of acute...
infection, however, because antibodies from prior exposure may circulate for a prolonged period of time.

**Synonyms:**
- Leptospira IgM antibody
- Leptospira IgM Dot Blot

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Reported:**
1-5 days

**CPT Codes:**
86720

**Notes:**
A negative result does not rule out the possibility of leptospirosis.
SLCO1B1, 1 Variant

ORDERING

Ordering Recommendations:
Identify individuals at increased risk for statin-related muscle toxicity.
Performing Lab:
ARUP
Performed:
Mon, Thu
Methodology:
Polymerase Chain Reaction/Fluorescence Monitoring
Reported:
5-10 days
Synonyms:
- Simvastatin myotoxicity assay
- Statin-induced myopathy assay

COLLECTION

Collect:
Lavender (EDTA) or pink (K2EDTA), or yellow (ACD Solution A or B).
Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month
Storage/Transport Temperature:
Refrigerated.
Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

PROCESSING

Test Code:
SCO1B1
ARUP Test Code:
2008426
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)
Unacceptable Conditions:
Plasma or serum. Heparinized specimens.
Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month
Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
By report
Interpretive Data:

Background Information for SLCO1B1, 1 Variant:
Characteristics: Simvastatin is a commonly prescribed hypolipidemic drug used for cholesterol reduction and control. Approximately 1-5 percent of exposed individuals may experience a dose-dependent myopathy (skeletal muscle toxicity). Symptoms may include pain, muscle weakness, and cramps. The organic anion transporter polypeptide 1B1, encoded by SLCO1B1, transports active simvastatin acid from the blood stream into the liver. This test detects a common variant that reduces the function of the transporter, resulting in an increased plasma concentration of the drug.

Inheritance: Autosomal co-dominant.
Cause: Simvastatin hypersensitivity reaction is strongly associated with the SLCO1B1*5 allele. The mechanism is related to changes in the activity of organic anion-transporter polypeptide 1B1 (OATP1B1). The *1 allele (normal transporter function) is presumed when the *5 allele is not detected. One copy of the *5 allele predicts decreased transporter function; two copies of the *5 allele predicts poor transporter function.

Allele Tested: SLCO1B1*5 (rs4149056, c.521T>C).

Allele Frequency: Middle Eastern 5 percent, Caucasian 1-3 percent, African 0-2 percent, Asian 0-2 percent, Less than 1 percent in other populations.

Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase Chain Reaction (PCR) and Fluorescence Monitoring.

Analytical Sensitivity and Specificity: Greater than 99 percent.

Limitations: Only the targeted SLCO1B1 variant will be detected. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with statins may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic or clinical monitoring.

ADMINISTRATIVE

CPT Codes:
81328

COMPLETE VIEW

Ordering Recommendations:
Identify individuals at increased risk for statin-related muscle toxicity.

Test Code:
SCO1B1

ARUP Test Code:
2008426

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon, Thu

Methodology:
Polymerase Chain Reaction/Fluorescence Monitoring

Collect:
Lavender (EDTA) or pink (K$_2$EDTA), or yellow (ACD Solution A or B).

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Reference Interval:
By report

Interpretive Data:
Background Information for SLCO1B1, 1 Variant:
Characteristics: Simvastatin is a commonly prescribed hypolipidemic drug used for cholesterol reduction and control. Approximately 1-5 percent of exposed individuals may experience a dose-dependent myopathy (skeletal muscle toxicity). Symptoms may include pain, muscle weakness, and cramps. The organic anion transporter polypeptide 1B1, encoded by SLCO1B1, transports active simvastatin acid from the blood stream into the liver. This test detects a common variant that reduces the function of the transporter, resulting in an increased plasma concentration of the drug.
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Inheritance: Autosomal co-dominant.
Cause: Simvastatin hypersensitivity reaction is strongly associated with the SLCO1B1*5 allele. The mechanism is related to changes in the activity of organic anion-transporter polypeptide 1B1 (OATP1B1). The *1 allele (normal transporter function) is presumed when the *5 allele is not detected. One copy of the *5 allele predicts decreased transporter function; two copies of the *5 allele predicts poor transporter function.
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Allele Frequency: Middle Eastern 5 percent, Caucasian 1-3 percent, African 0-2 percent, Asian 0-2 percent, Less than 1 percent in other populations.
Clinical Sensitivity: Drug-dependent.
Methodology: Polymerase Chain Reaction (PCR) and Fluorescence Monitoring.
Analytical Sensitivity and Specificity: Greater than 99 percent.
Limitations: Only the targeted SLCO1B1 variant will be detected. Diagnostic errors can occur due to rare sequence variations. Risk of therapeutic failure or adverse reactions with statins may be affected by genetic and non-genetic factors that are not detected by this test. This result does not replace the need for therapeutic or clinical monitoring.

Synonyms:
- Simvastatin myotoxicity assay
- Statin-induced myopathy assay

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Reported:
5-10 days

CPT Codes:
81328
1- hour 50 gram Glucose Loading Screen

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Parnassus ACC 0730-1530 weekdays.
Mission Bay 0700-1400 weekdays.
Mount Zion 2230 Post St. 0800-1400 weekdays.
Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)
Additional Information:
This 1 hour glucose loading screen is part of a two step screening approach used to screen pregnant patients for gestational diabetes (GDM). When this step is abnormal, it is followed by the second step "3 hour 100 gram Glucose Tolerance Test, Pregnancy."

Synonyms:
- Diabetes mellitus
- GCT
- Glucose challenge test

COLLECTION

Sample Type:
Serum
Collect:
Gray top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Remarks:
This screening test may be given at any time of day, without regard to prior meals.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

PROCESSING

Test Code:
GLT1
Test Group:
Glucose
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days
RESULT INTERPRETATION

Units:
- mg/dL

Reference Interval:
- 1 hour post-50 g po glucose, without regard to whether patient had been fasting: 70 - 129 mg/dL

Additional Information:
- This 1 hour glucose loading screen is part of a two step screening approach used to screen pregnant patients for gestational diabetes (GDM). When this step is abnormal, it is followed by the second step "3 hour 100 gram Glucose Tolerance Test, Pregnancy."

ADMINISTRATIVE

CPT Codes:
- 82950

LOINC Codes:
- 1504-0

COMPLETE VIEW

Available Stat:
- No

Test Code:
- GLT1

Test Group:
- Glucose

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
- Parnassus ACC 0730-1530 weekdays.
- Mission Bay 0700-1400 weekdays.
- Mount Zion 2230 Post St. 0800-1400 weekdays.

Methodology:
- Oxygen consumption (O2 electrode with glucose oxidase)

Remarks:
- This screening test may be given at any time of day, without regard to prior meals.

Collect:
- Gray top

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum

Preferred Volume:
- 0.5 mL serum

Minimum Volume:
- 0.2 mL serum

Units:
- mg/dL

Reference Interval:
- 1 hour post-50 g po glucose, without regard to whether patient had been fasting: 70 - 129 mg/dL

Synonyms:
- Diabetes mellitus
- GCT
- Glucose challenge test
Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 2 days

Additional Information:
   This 1 hour glucose loading screen is part of a two step screening approach used to screen pregnant patients for gestational diabetes (GDM). When this step is abnormal, it is followed by the second step "3 hour 100 gram Glucose Tolerance Test, Pregnancy."

CPT Codes:
   82950

LOINC Codes:
   1504-0
1,25-Dihydroxy Vitamin D
VD125

ORDERING

Performing Lab:
Chemistry China Basin

Performed:
Test performed once a week (Tuesday)

Methodology:
Chemiluminescent Immunoassay - Diasorin Liaison XL

Synonyms:
- DHD
- calcitriol

COLLECTION

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
3 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
400 uL serum

Stability (from collection to initiation):
- Room Temperature: 7 days
- Refrigerated (2-8°C): 14 days
- Frozen (-20°C or colder): 6 months

PROCESSING

Test Code:
VD125

Performing Lab:
Chemistry China Basin

Specimen Preparation:
Refrigerate serum aliquot.

Preferred Volume:
1 mL serum

Minimum Volume:
400 uL serum

Stability (from collection to initiation):
- Room Temperature: 7 days
- Refrigerated (2-8°C): 14 days
- Frozen (-20°C or colder): 6 months

RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:
Pediatrics:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval (pg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to &lt; 1 year</td>
<td>30 - 181</td>
</tr>
<tr>
<td>1 to &lt; 3 years</td>
<td>43 - 140</td>
</tr>
<tr>
<td>3 to &lt; 19 years</td>
<td>42 - 95</td>
</tr>
</tbody>
</table>

Adults: 20 - 79 pg/mL

Adult reference range adopted from vendor and verified in-house.


ADMINISTRATIVE

CPT Codes:
82652

LOINC Codes:
1649-3

COMPLETE VIEW

Test Code:
VD125

Performing Lab:
Chemistry China Basin

Performed:
Test performed once a week (Tuesday)

Methodology:
Chemiluminescent Immunoassay - Diasorin Liaison XL

Collect:
Gold top or Red top

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
400 uL serum

Specimen Preparation:
Refrigerate serum aliquot.

Units:
pg/mL

Reference Interval:

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Adults: 20 - 79 pg/mL

Adult reference range adopted from vendor and verified in-house.

Synonyms:
- DHD
- calcitriol

Stability (from collection to initiation):
- Room Temperature: 7 days
- Refrigerated (2-8°C): 14 days
- Frozen (-20°C or colder): 6 months

CPT Codes:
- 82652

LOINC Codes:
- 1649-3
11-Deoxycorticosterone Quantitative by HPLC-MS/MS, Serum or Plasma

ORDERING

Performing Lab: ARUP
Performed: Mon, Wed, Fri
Methodology: Quantitative High Performance Liquid Chromatography-Tandem Mass Spectrometry
Reported: 2-5 days
Synonyms:
  • DOC

COLLECTION

Sample Type: Serum or plasma
Collect: Serum separator tube. Also acceptable: Plain red, pink (K$_2$EDTA), plasma separator tube, green (sodium heparin), or green (lithium heparin).
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum/plasma
Minimum Volume: 0.3 mL serum/plasma
Stability (from collection to initiation):
  After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months
Storage/Transport Temperature:
  Refrigerated. Also acceptable: Frozen.
Unacceptable Conditions:
  Grossly hemolyzed specimens.

PROCESSING

Test Code: DOC
ARUP Test Code: 2008458
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation:
  Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)
Preferred Volume: 1 mL serum/plasma
Minimum Volume: 0.3 mL serum/plasma
Unacceptable Conditions:
  Grossly hemolyzed specimens.
Stability (from collection to initiation):
   After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months

Storage/Transport Temperature:
   Refrigerated. Also acceptable: Frozen.

RESULT INTERPRETATION

Units:
   ng/dL

Reference Interval:
   Effective August 18, 2014

<table>
<thead>
<tr>
<th>Gestation Time, Age</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature (26-28 weeks)</td>
<td>20 - 105 ng/dL</td>
</tr>
<tr>
<td>Premature (29-33 weeks)</td>
<td>Not Established</td>
</tr>
<tr>
<td>Premature (34-36 weeks)</td>
<td>28 - 78 ng/dL</td>
</tr>
<tr>
<td>Full Term Newborn</td>
<td>Elevated at birth; decreases to 7-49 ng/dL during first week</td>
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<tr>
<td>1-11 months</td>
<td>7-49 ng/dL</td>
</tr>
<tr>
<td>Prepubertal child</td>
<td>Less than or equal to 34 ng/dL</td>
</tr>
<tr>
<td>Adults</td>
<td>Less than or equal to 19 ng/dL</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
   82633

LOINC:
   1656-8

LOINC Codes:
   1656-8

COMPLETE VIEW

Test Code:
   DOC

ARUP Test Code:
   2008458

Performing Lab:
   ARUP

Sendout:
   Yes

Performed:
   Mon, Wed, Fri

Methodology:
   Quantitative High Performance Liquid Chromatography-Tandem Mass Spectrometry

Collect:
   Serum separator tube. Also acceptable: Plain red, pink (K₂EDTA), plasma separator tube, green (sodium heparin), or green (lithium heparin).

Amount to Collect:
   2 mL blood

Sample Type:
   Serum or plasma

Preferred Volume:
1 mL serum/plasma

**Minimum Volume:**

0.3 mL serum/plasma

**Unacceptable Conditions:**

Grossly hemolyzed specimens.

**Specimen Preparation:**

Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)

**Units:**

ng/dL

**Reference Interval:**

Effective August 18, 2014

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<td>Adults</td>
<td>Less than or equal to 19 ng/dL</td>
</tr>
</tbody>
</table>

**Synonyms:**

- DOC

**Storage/Transport Temperature:**

Refrigerated. Also acceptable: Frozen.

**Stability (from collection to initiation):**

After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months

**Reported:**

2-5 days

**CPT Codes:**

82633

**LOINC:**

- 1656-8

**LOINC Codes:**

1656-8

Test information subject to change
14Q32 IGH Rearrangement FISH
IGHQ32, BIGH

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization (break apart FISH)
Reported:
7-14 days
Synonyms:
- IGH Rearrangement
- IGHQ32
- BIGH

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Dark Green top
Amount to Collect:
See preferred volume.
Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm
Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm
Remarks:
Mix sample well by gentle inversion.
Stability (from collection to initiation):
48 hours
Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
- BIGH: Blood
- IGHQ32: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours
Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm
Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
- 48 hours

RESULT INTERPRETATION

Reference Interval:
- Not detected

ADMINISTRATIVE

CPT Codes:
- 88271 x2, 88275 x1

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BIGH: Blood
- IGHQ32: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Methodology:
- Fluorescent in-situ hybridization (break apart FISH)

Remarks:
- Mix sample well by gentle inversion.

Collect:
- Dark Green top

Amount to Collect:
- See preferred volume.

Sample Type:
- Heparinized whole blood, bone marrow, bone core

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:
- Not detected

Synonyms:
- IGH Rearrangement
- IGHQ32
- BIGH

**Stability (from collection to initiation):**

48 hours

**Reported:**

7-14 days

**CPT Codes:**

88271 x2, 88275 x1

**LDT or Modified FDA:**

Yes
2 Hour, 75 gram Glucose Tolerance Test, Non-pregnancy
OGT, NP120

ORDERING

Ordering Recommendations:
THIS TEST IS NO LONGER RECOMMENDED FOR ROUTINE USE.

See Additional Information.

Available Stat:
No

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Additional Information:
Based on 75 g dose ingested over 5 minutes.

THIS TEST IS NO LONGER RECOMMENDED FOR ROUTINE USE.

When performed it is abbreviated to a single 2 hour post-glucose specimen.

All patients should be screened with a fasting glucose: Do not perform this test if the fasting glucose exceeds 125!

90% of patients whose 2 hour level is > 199 mg/dL have fasting hyperglycemia, obviating the need for tolerance testing.

Reference values from position statement of the American Diabetes Association on Diagnosis and Classification of Diabetes (Diabetes Care, Volume 34, Supplement 1, January 2011).

Synonyms:
- Diabetes mellitus

COLLECTION

Patient Preparation:
The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate and carry out normal physical activity for at least 3 days prior to the morning of the test. An overnight fast of between 8 to 14 hours is required before initial baseline sample collection.

Sample Type:
Serum

Collect:
Gray top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Remarks:
Outpatient testing at ACC available 0730-1400 weekdays, Mission Bay from 0700-1400 and at 2330 Post St. 0800-1400 weekdays.

The patient should be seated for the test and should not smoke.

A gray top tube should be used.

For patients < 18 years of age, obtain the patient's weight and give the patient 1.75 g of glucose per kg of body weight. If the weight is in
pounds, divide by 2.2 to get kg. Do not provide more than 75 g dose regardless of body weight.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days

**PROCESSING**

- **Test Code:** OGT, NP120
- **Test Group:** Glucose
- **Performing Lab:** Parnassus, Mission Bay & Mt. Zion Chemistry
- **Preferred Volume:** 0.5 mL serum
- **Minimum Volume:** 0.2 mL serum
- **Stability (from collection to initiation):** Room temperature 8 hours, refrigerated 2 days

**RESULT INTERPRETATION**

- **Units:** mg/dL
- **Reference Interval:**
  - Fasting: 70-99 mg/dL
  - Normal (post glucose): <140 mg/dL
  - Impaired glucose tolerance (post glucose): 140-199 mg/dL
  - Diabetes mellitus (post glucose): >199 mg/dL*

* If confirmed on another day by repeat OGT, or a diagnostic elevation of the fasting or non-fasting glucose.

**Additional Information:**
- Based on 75 g dose ingested over 5 minutes.
- **THIS TEST IS NO LONGER RECOMMENDED FOR ROUTINE USE.**
- When performed it is abbreviated to a single 2 hour post-glucose specimen.
- All patients should be screened with a fasting glucose: Do not perform this test if the fasting glucose exceeds 125!
- 90% of patients whose 2 hour level is > 199 mg/dL have fasting hyperglycemia, obviating the need for tolerance testing.
- Reference values from position statement of the American Diabetes Association on Diagnosis and Classification of Diabetes (Diabetes Care, Volume 34, Supplement 1, January 2011).

**ADMINISTRATIVE**

- **CPT Codes:** 82947

**COMPLETE VIEW**

- **Available Stat:** No
- **Ordering Recommendations:** THIS TEST IS NO LONGER RECOMMENDED FOR ROUTINE USE.
See Additional Information.

**Test Code:**
OGT, NP120

**Test Group:**
Glucose

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Oxygen consumption (O2 electrode with glucose oxidase)

**Patient Preparation:**
The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate and carry out normal physical activity for at least 3 days prior to the morning of the test. An overnight fast of between 8 to 14 hours is required before initial baseline sample collection.

**Remarks:**
Outpatient testing at ACC available 0730-1400 weekdays, Mission Bay from 0700-1400 and at 2330 Post St. 0800-1400 weekdays.

The patient should be seated for the test and should not smoke.

A gray top tube should be used.

For patients < 18 years of age, obtain the patient's weight and give the patient 1.75 g of glucose per kg of body weight. If the weight is in pounds, divide by 2.2 to get kg. Do not provide more than 75 g dose regardless of body weight.

**Collect:**
Gray top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Units:**
mg/dL

**Reference Interval:**
- Fasting: 70-99 mg/dL
- Normal (post glucose): <140 mg/dL
- Impaired glucose tolerance (post glucose): 140-199 mg/dL
- Diabetes mellitus (post glucose): >199 mg/dL*

* If confirmed on another day by repeat OGT, or a diagnostic elevation of the fasting or non-fasting glucose.

**Synonyms:**
- Diabetes mellitus

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days

**Additional Information:**
Based on 75 g dose ingested over 5 minutes.

**THIS TEST IS NO LONGER RECOMMENDED FOR ROUTINE USE.**

When performed it is abbreviated to a single 2 hour post-glucose specimen.

All patients should be screened with a fasting glucose: Do not perform this test if the fasting glucose exceeds 125!
90% of patients whose 2 hour level is > 199 mg/dL have fasting hyperglycemia, obviating the need for tolerance testing.

Reference values from position statement of the American Diabetes Association on Diagnosis and Classification of Diabetes (Diabetes Care, Volume 34, Supplement 1, January 2011).

CPT Codes:
82947
2 Hour, 75 gram Glucose Tolerance Test, Pregnancy
OGTP2, GT60 & GT120

ORDERING

Available Stat: No
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
  - Parnassus ACC 0730-1400 weekdays.
  - Mission Bay 0700-1400 weekdays
  - Mount Zion 2230 Post St. 0800-1400 weekdays.
Methodology:
  - Oxygen consumption (O2 electrode with glucose oxidase)
Additional Information:
  - For further information on the "2 Hour, 75 gram Glucose Tolerance Test, Pregnancy," refer to the UpToDate section on screening and diagnosis of diabetes mellitus during pregnancy and also the International Association of Diabetes and Pregnancy Study Groups Recommendations on the Diagnosis and Classification of Hyperglycemia in Pregnancy, Diabetes Care, 33:676-682, 2010
Synonyms:
  - Diabetes mellitus

COLLECTION

Patient Preparation:
  - The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate per day and carry out normal physical activity for at least 3 days prior to the morning of the test. An 8-10 hour fast is required before initial baseline sample collection.
Sample Type:
  - Serum
Collect:
  - Gray top
Amount to Collect:
  - 1 mL blood
Preferred Volume:
  - 0.5 mL serum
Minimum Volume:
  - 0.2 mL serum
Remarks:
  - The patient should be seated for the test and should not smoke.
  - Collect all samples in Gray top tubes
  - Obtain a fasting sample and send to lab for stat glucose testing. If the fasting glucose result is >=92 mg/dL, the glucose dose is not given to the patient. The outpatient personnel must contact the Diabetes Clinic (3-2868) to inform them of the fasting glucose result and ask for instructions to provide to the patient.
Stability (from collection to initiation):
  - Room temperature 8 hours, refrigerated 2 days

PROCESSING

Test Code:
  - OGTP2, GT60 & GT120
Test Group:
  - Glucose
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:
  0.5 mL serum

Minimum Volume:
  0.2 mL serum

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days

RESULT INTERPRETATION

Units:
  mg/dL

Reference Interval:
  Fasting: 70-91 mg/dL 1
  hour (post glucose): < 180 mg/dL
  2 hour (post glucose): < 153 mg/dL

Additional Information:
  For further information on the "2 Hour, 75 gram Glucose Tolerance Test, Pregnancy," refer to the UpToDate section on screening and diagnosis of diabetes mellitus during pregnancy and also the International Association of Diabetes and Pregnancy Study Groups Recommendations on the Diagnosis and Classification of Hyperglycemia in Pregnancy, Diabetes Care, 33:676-682, 2010

ADMINISTRATIVE

CPT Codes:
  82947

COMPLETE VIEW

Available Stat:
  No

Test Code:
  OGTP2. GT60 & GT120

Test Group:
  Glucose

Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
  Parnassus ACC 0730-1400 weekdays.
  Mission Bay 0700-1400 weekdays
  Mount Zion 2230 Post St. 0800-1400 weekdays.

Methodology:
  Oxygen consumption (O2 electrode with glucose oxidase)

Patient Preparation:
  The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate per day and carry out normal physical activity for at least 3 days prior to the morning of the test. An 8-10 hour fast is required before initial baseline sample collection.

Remarks:
  The patient should be seated for the test and should not smoke.

  Collect all samples in Gray top tubes

Obtain a fasting sample and send to lab for stat glucose testing. If the fasting glucose result is >=92 mg/dL, the glucose dose is not given to the patient. The outpatient personnel must contact the Diabetes Clinic (3-2868) to inform them of the fasting glucose result and ask for instructions to provide to the patient.

Collect:
  Gray top
Amount to Collect: 1 mL blood

Sample Type: Serum

Preferred Volume: 0.5 mL serum

Minimum Volume: 0.2 mL serum

Units: mg/dL

Reference Interval:
- Fasting: 70-91 mg/dL
- 1 hour (post glucose): < 180 mg/dL
- 2 hour (post glucose): < 153 mg/dL

Synonyms:
- Diabetes mellitus

Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days

Additional Information:
For further information on the "2 Hour, 75 gram Glucose Tolerance Test, Pregnancy," refer to the UpToDate section on screening and diagnosis of diabetes mellitus during pregnancy and also the International Association of Diabetes and Pregnancy Study Groups Recommendations on the Diagnosis and Classification of Hyperglycemia in Pregnancy, Diabetes Care, 33:676-682, 2010

CPT Codes:
82947
2,3-dinor 11B-Prostaglandin F2a

ORDERING

Performing Lab: Mayo
Methodology: LC-MS/MS
Additional Information:
2,3-Dinor-11beta-prostaglandin F2 alpha is the most abundant metabolic product of prostaglandins released by activated mast cells. Systemic mastocytosis (SM) is a disease in which clonally derived mast cells accumulate in peripheral tissues. Degranulation of these mast cells releases large amounts of histamines, prostaglandins, leukotrienes, and tryptase.

COLLECTION

Sample Type: Random/24 hour urine
Collect: Urine container
Amount to Collect: 4 mL
Preferred Volume: 4 mL
Minimum Volume: 4 mL
Remarks: Random or 24 hour urine acceptable. No preservative preferred.
Stability (from collection to initiation):
Refrigerated (preferred): 14 days
Frozen: 30 days
Ambient: 8 hours

PROCESSING

Test Code: 23BPG
Sendout: Yes
Performing Lab: Mayo
Specimen Preparation:
Aliquot and freeze specimen. Transport to CB frozen. Order Mayo test code 23BPG.
Preferred Volume: 4 mL
Minimum Volume: 4 mL
Stability (from collection to initiation):
Refrigerated (preferred): 14 days
Frozen: 30 days
Ambient: 8 hours

RESULT INTERPRETATION
Units:
pg/mg Cr

Reference Interval:
<5205 pg/mg Cr

Additional Information:
2,3-Dinor-11beta-prostaglandin F2 alpha is the most abundant metabolic product of prostaglandins released by activated mast cells. Systemic mastocytosis (SM) is a disease in which clonally derived mast cells accumulate in peripheral tissues. Degranulation of these mast cells releases large amounts of histamines, prostaglandins, leukotrienes, and tryptase.

ADMINISTRATIVE

CPT Codes:
84150-90

COMPLETE VIEW

Test Code:
23BPG

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
LC-MS/MS

Remarks:
Random or 24 hour urine acceptable. No preservative preferred.

Collect:
Urine container

Amount to Collect:
4 mL

Sample Type:
Random/24 hour urine

Preferred Volume:
4 mL

Minimum Volume:
4 mL

Specimen Preparation:
Aliquot and freeze specimen. Transport to CB frozen. Order Mayo test code 23BPG.

Units:
pg/mg Cr

Reference Interval:
<5205 pg/mg Cr

Stability (from collection to initiation):
Refrigerated (preferred): 14 days
Frozen: 30 days
Ambient: 8 hours

Additional Information:
2,3-Dinor-11beta-prostaglandin F2 alpha is the most abundant metabolic product of prostaglandins released by activated mast cells. Systemic mastocytosis (SM) is a disease in which clonally derived mast cells accumulate in peripheral tissues. Degranulation of these mast cells releases large amounts of histamines, prostaglandins, leukotrienes, and tryptase.

CPT Codes:
84150-90
21-Hydroxylase Antibody
21HA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Radiobinding
Reported:
5-7 days
Additional Information:
Used in the diagnosis of Autoimmune Polyglandular Syndrome (APS), Type 1 or 2. and/or Addison's disease.

COLLECTION

Sample Type:
Serum
Collect:
Gold or Red top vacutainer
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 6 months

PROCESSING

Test Code:
21HA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze serum. Transport to CB frozen. Order Quest test code 177816P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 6 months

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Used in the diagnosis of Autoimmune Polyglandular Syndrome (APS), Type 1 or 2, and/or Addison's disease.

**ADMINISTRATIVE**

CPT Codes:
- 83519-90

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- 21HA

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Radiobinding

Collect:
- Gold or Red top vacutainer

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Specimen Preparation:
- Aliquot and freeze serum. Transport to CB frozen. Order Quest test code 177816P

Reference Interval:
- Negative

Stability (from collection to initiation):
- Room temperature 1 day, refrigerated 1 week, frozen 6 months

Reported:
- 5-7 days

Additional Information:
- Used in the diagnosis of Autoimmune Polyglandular Syndrome (APS), Type 1 or 2, and/or Addison's disease.

CPT Codes:
- 83519-90
3 hour 100 gram Glucose Tolerance Test, Pregnancy
OGTP, 3GT60, 3GT120, 3GT180

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Parnassus ACC 0730-1330 weekdays.
Mission Bay 0700-1330 weekdays.
Mount Zion 2230 Post St. 0800-1330 weekdays.
Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Additional Information:
Glucose tolerance screening for gestational diabetes mellitus (GDM) may be performed as a one step approach or as a two step approach. This “3 hour 100 gram glucose tolerance test, pregnancy” is the second test in the two step screening approach for GDM. For the first test in the two step screening approach, see the “1 hour 50 gram glucose loading screen.” A positive diagnosis in this second step test requires that two or more reference range thresholds be met or exceeded. For a discussion on the reference range for this test, see UpToDate section on “Screening for and diagnosis of diabetes mellitus during pregnancy.”

For the one step approach to screening for GDM, see "2 Hour, 75 gram Glucose Tolerance Test, Pregnant."

"Glucose tolerance beverages are available in 100 g bottles (10 g/fl. oz. at 10 oz.) at ACC, and 100 g and 50 g bottles (10 g/fl. oz., 5 g/fl. oz. both 10 oz.) at Post St.

Source of reference range: UpToDate and the 4th International Workshop on Gestational Diabetes

Synonyms:
- Diabetes mellitus

COLLECTION

Patient Preparation:
The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate and carry out normal physical activity for at least 3 days prior to the morning of the test, which is administered after an 8-14 hour fast.

Sample Type:
Plasma
Collect:
Gray top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma
Minimum Volume:
0.2 mL plasma
Remarks:
The patient should be seated for the test and should not smoke.

Collect all samples in Gray top tubes

An 8-14 hour fast is required to perform this test. If the patient did not fast for this period, cancel the test and inform the patient to return after fasting for the required time.

Obtain a fasting sample and send to lab for stat testing and follow the 3 hour glucose tolerance testing procedure for the remaining samples.
Note: The fasting glucose result must be <110 mg/dL to proceed with the glucose tolerance test. If the fasting glucose result is 110 mg/dL or higher, cancel the glucose tolerance test.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days

**PROCESSING**

**Test Code:**
- OGTP, 3GT60, 3GT120, 3GT180

**Test Group:**
- Glucose

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Preferred Volume:**
- 0.5 mL plasma

**Minimum Volume:**
- 0.2 mL plasma

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days

**RESULT INTERPRETATION**

**Units:**
- mg/dL

**Reference Interval:**
- Fasting: 70-94 mg/dL
- 1 hour (post glucose): <180 mg/dL
- 2 hour (post glucose): <155 mg/dL
- 3 hour (post glucose): <140 mg/dL

**Additional Information:**
Glucose tolerance screening for gestational diabetes mellitus (GDM) may be performed as a one step approach or as a two step approach. This “3 hour 100 gram glucose tolerance test, pregnancy” is the second test in the two step screening approach for GDM. For the first test in the two step screening approach, see the “1 hour 50 gram glucose loading screen.” A positive diagnosis in this second step test requires that two or more reference range thresholds be met or exceeded. For a discussion on the reference range for this test, see UpToDate section on “Screening for and diagnosis of diabetes mellitus during pregnancy.”

For the one step approach to screening for GDM, see “2 Hour, 75 gram Glucose Tolerance Test, Pregnant.”

“Glucose tolerance beverages are available in 100 g bottles (10 g/fl. oz. at 10 oz.) at ACC, and 100 g and 50 g bottles (10 g/fl. oz., 5 g/fl. oz. both 10 oz.) at Post St.

Source of reference range: UpToDate and the 4th International Workshop on Gestational Diabetes

**ADMINISTRATIVE**

**CPT Codes:**
- 82947

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- OGTP, 3GT60, 3GT120, 3GT180

**Test Group:**
Glucose

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
- Parnassus ACC 0730-1330 weekdays.
- Mission Bay 0700-1330 weekdays.
- Mount Zion 2230 Post St. 0800-1330 weekdays.

**Methodology:**
- Oxygen consumption (O2 electrode with glucose oxidase)

**Patient Preparation:**
- The patient should be instructed by the care-giver to eat a normal diet containing at least 150 g of carbohydrate and carry out normal physical activity for at least 3 days prior to the morning of the test, which is administered after an 8-14 hour fast.

**Remarks:**
- The patient should be seated for the test and should not smoke.
- Collect all samples in Gray top tubes
- An 8-14 hour fast is required to perform this test. If the patient did not fast for this period, cancel the test and inform the patient to return after fasting for the required time.
- Obtain a fasting sample and send to lab for stat testing and follow the 3 hour glucose tolerance testing procedure for the remaining samples.
- Note: The fasting glucose result must be <110 mg/dL to proceed with the glucose tolerance test. If the fasting glucose result is 110 mg/dL or higher, cancel the glucose tolerance test.

**Collect:**
- Gray top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Plasma

**Preferred Volume:**
- 0.5 mL plasma

**Minimum Volume:**
- 0.2 mL plasma

**Units:**
- mg/dL

**Reference Interval:**
- Fasting 70-94 mg/dL
- 1 hour (post glucose) <180 mg/dL
- 2 hour (post glucose) <155 mg/dL
- 3 hour (post glucose) <140 mg/dL

**Synonyms:**
- Diabetes mellitus

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days

**Additional Information:**
- Glucose tolerance screening for gestational diabetes mellitus (GDM) may be performed as a one step approach or as a two step approach. This “3 hour 100 gram glucose tolerance test, pregnancy” is the second test in the two step screening approach for GDM. For the first test in the two step screening approach, see the “1 hour 50 gram glucose loading screen.” A positive diagnosis in this second step test requires that two or more reference range thresholds be met or exceeded. For a discussion on the reference range for this test, see UpToDate section on “Screening for and diagnosis of diabetes mellitus during pregnancy.”

For the one step approach to screening for GDM, see “2 Hour, 75 gram Glucose Tolerance Test, Pregnant.”

"Glucose tolerance beverages are available in 100 g bottles (10 g/fl. oz. at 10 oz.) at ACC, and 100 g and 50 g bottles (10 g/fl. oz., 5 g/fl. oz. both 10 oz.) at Post St."
Source of reference range: UpToDate and the 4th International Workshop on Gestational Diabetes

CPT Codes:
82947
3-Hydroxy-3-Methylglutaryl Coenzyme A Reductase (HMGCR) Antibody, IgG

**ORDERING**

Ordering Recommendations:
- Differential diagnosis of myositis in patients with or without statin exposure.

Performing Lab:
- ARUP

Performed:
- Fri

Methodology:
- Semi-Quantitative Enzyme-Linked Immunosorbent Assay

Reported:
- 1-15 days

**COLLECTION**

Sample Type:
- Serum (Gold top tube)

Collect:
- Serum Separator Tube (SST).

Amount to Collect:
- 1 mL blood

Preferred Volume:
- 0.5 mL serum

Minimum Volume:
- 0.15 mL serum

Stability (from collection to initiation):
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
- Refrigerated. Also acceptable: Frozen.

Unacceptable Conditions:
- Other body fluids. Contaminated, hemolyzed, grossly icteric, or severely lipemic specimens.

**PROCESSING**

Test Code:
- HMGCR

ARUP Test Code:
- 2013101

Sendout:
- Yes

Performing Lab:
- ARUP

Specimen Preparation:
- Transfer 0.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.15 mL)

Additional Processing Instructions:
- Aliquot and freeze specimen. Transport to CB frozen. Order ARUP test code 2013101.

Preferred Volume:
- 0.5 mL serum

Minimum Volume:
- 0.15 mL serum
Unacceptable Conditions:
Other body fluids. Contaminated, hemolyzed, grossly icteric, or severely lipemic specimens.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated. Also acceptable: Frozen.

RESULT INTERPRETATION

Reference Interval:
0-19 Units: Negative

Interpretive Data:
IgG antibodies to 3-hydroxy-3-methylglutaryl-coenzyme A reductase (HMGCR) are mainly associated with necrotizing autoimmune myopathy (NAM) in a subset of statin-treated patients. Although infrequent, these antibodies may also be observed in statin-naive patients with NAM. Strong clinical correlation is recommended in the absence of muscle fiber necrosis, elevated serum creatine kinase, perimysial pathology, and/or statin exposure.

ADMINISTRATIVE

CPT Codes:
83516

COMPLETE VIEW

Ordering Recommendations:
Differential diagnosis of myositis in patients with or without statin exposure.

Test Code:
HMGCR

ARUP Test Code:
2013101

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Fri

Methodology:
Semi-Quantitative Enzyme-Linked Immunosorbent Assay

Collect:
Serum Separator Tube (SST).

Amount to Collect:
1 mL blood

Sample Type:
Serum (Gold top tube)

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.15 mL serum

Unacceptable Conditions:
Other body fluids. Contaminated, hemolyzed, grossly icteric, or severely lipemic specimens.

Specimen Preparation:
Transfer 0.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.15 mL)

Additional Processing Instructions:
Aliquot and freeze specimen. Transport to CB frozen. Order ARUP test code 2013101.
**Reference Interval:**

0-19 Units: Negative

**Interpretive Data:**

IgG antibodies to 3-hydroxy-3-methylglutaryl-coenzyme A reductase (HMGCR) are mainly associated with necrotizing autoimmune myopathy (NAM) in a subset of statin-treated patients. Although infrequent, these antibodies may also be observed in statin-naive patients with NAM. Strong clinical correlation is recommended in the absence of muscle fiber necrosis, elevated serum creatine kinase, perimysial pathology, and/or statin exposure.

**Storage/Transport Temperature:**

Refrigerated. Also acceptable: Frozen.

**Stability (from collection to initiation):**

After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Reported:**

1-15 days

**CPT Codes:**

83516
# 5-Hydroxyindoleacetic acid, 24 hour urine

**5HQT**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td>HPLC</td>
</tr>
<tr>
<td>Reported:</td>
<td>Test run Monday-Friday. Turnaround: 2-5 days.</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>To convert mg to µmol (SI units) multiply by 5.2.</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>HIAA</td>
</tr>
</tbody>
</table>

## COLLECTION

| Patient Preparation: | Patient should avoid food high in indoles: avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes. Patient should also avoid alcohol, tobacco, tea and coffee three days prior to and during specimen collection. |
| Sample Type: | 24 hour urine collection |
| Collect: | 24 hour urine collection container |
| Amount to Collect: | Entire 24 urine output |
| Preferred Volume: | 10 mL urine |
| Minimum Volume: | 5 mL urine |
| Remarks: | 72 hours prior to and throughout the entire period of specimen collection avoid avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes, as well as alcohol, coffee, tea and tobacco. Obtain container with preservative at Specimen Receiving. Refrigerate sample while collecting. |

## PROCESSING

| Test Code: | 5HQT |
| Test Group: | HIAA |
| Sendout: | Yes |
| Performing Lab: | Quest |
| Specimen Preparation: | Refrigerate aliquot. Order Quest # 9936N |
| Preferred Volume: | 10 mL urine |
| Minimum Volume: | 5 mL urine |
### RESULT INTERPRETATION

**Units:** mg/24 h or mg/g creat.

**Reference Interval:**
- 2-10 years: < 8.0 mg/d
- > 10 years: < 6.0 mg/d

**Additional Information:**
To convert mg to µmol (SI units) multiply by 5.2.

### ADMINISTRATIVE

**CPT Codes:**
- 82570-90, 83497-90

**LOINC Codes:**
- 31203-3

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- 5HQT

**Test Group:**
- HIAA

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- HPLC

**Patient Preparation:**
Patient should avoid food high in indoles: avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes. Patient should also avoid alcohol, tobacco, tea and coffee three days prior to and during specimen collection.

**Remarks:**
72 hours prior to and throughout the entire period of specimen collection avoid avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes, as well as alcohol, coffee, tea and tobacco. Obtain container with preservative at Specimen Receiving. Refrigerate sample while collecting.

**Collect:**
- [24 hour urine collection container](#)

**Amount to Collect:**
- Entire 24 urine output

**Sample Type:**
- 24 hour urine collection

**Preferred Volume:**
- 10 mL urine

**Minimum Volume:**
- 5 mL urine

**Specimen Preparation:**
- Refrigerate aliquot. Order Quest # 9936N

**Units:**
- mg/24 h or mg/g creat.

**Reference Interval:**
- 2-10 years: < 8.0 mg/d
> 10 years: < 6.0 mg/d

**Synonyms:**
- HIAA

**Reported:**
Test run Monday-Friday. Turnaround: 2-5 days.

**Additional Information:**
To convert mg to µmol (SI units) multiply by 5.2.

**CPT Codes:**
82570-90, 83497-90

**LOINC Codes:**
31203-3
5-Hydroxyindoleacetic acid, random urine
5HQTR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC with electrochemical detection
Reported:
Set up 5x per week, turnaround 3-5 days
Additional Information:
5-HIAA is the end product of serotonin (5-hydroxytryptophan) and tryptophan metabolism. Patients with carcinoid tumors of the midgut, e.g., ileum, produce high concentrations of 5-HIAA. Patients with carcinoid tumors of the foregut and hindgut may produce little or no 5-HIAA or do so intermittently.
Synonyms:
- HIAA

COLLECTION

Patient Preparation:
Patient should avoid food high in indoles: avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes. Patient should also avoid alcohol, tobacco, tea and coffee three days prior to and during specimen collection.
Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 month, frozen at -20C 1 month

PROCESSING

Test Code:
5HQTR
Test Group:
HIAA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot sample and adjust urine pH to < 3.0 using 6N HCl. Refrigerate. Order Quest test # 84871N
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 month, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
mg/g creatinine

Reference Interval:
2-10 years: <= 12.0 mg/g creatinine
> 10 years: <= 10.0 mg/g creatinine

Additional Information:
5-HIAA is the end product of serotonin (5-hydroxytryptophan) and tryptophan metabolism. Patients with carcinoid tumors of the midgut, e.g., ileum, produce high concentrations of 5-HIAA. Patients with carcinoid tumors of the foregut and hindgut may produce little or no 5-HIAA or do so intermittently.

ADMINISTRATIVE

CPT Codes:
82570-90, 83497-90

LOINC Codes:
11145-0

COMPLETE VIEW

Available Stat:
No

Test Code:
5HQTR

Test Group:
HIAA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC with electrochemical detection

Patient Preparation:
Patient should avoid food high in indoles: avocados, bananas, berries, eggplant, nuts, passion fruit, pineapple and its juice, plantains, plums, and tomatoes. Patient should also avoid alcohol, tobacco, tea and coffee three days prior to and during specimen collection.

Collect:
Urine cup

Amount to Collect:
20 mL urine

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Aliquot sample and adjust urine pH to < 3.0 using 6N HCl. Refrigerate. Order Quest test # 84871N

Units:
mg/g creatinine

Reference Interval:
2-10 years: <= 12.0 mg/g creatinine
> 10 years: <= 10.0 mg/g creatinine

**Synonyms:**
- HIAA

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 1 month, frozen at -20°C 1 month

**Reported:**
- Set up 5x per week, turnaround 3-5 days

**Additional Information:**
5-HIAA is the end product of serotonin (5-hydroxytryptophan) and tryptophan metabolism. Patients with carcinoid tumors of the midgut, e.g., ileum, produce high concentrations of 5-HIAA. Patients with carcinoid tumors of the foregut and hindgut may produce little or no 5-HIAA or do so intermittently.

**CPT Codes:**
- 82570-90, 83497-90

**LOINC Codes:**
- 11145-0
7-Dehydrocholesterol
DHC7

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
GCMS
Reported:
Batched 1-2 times per week. Turnaround 7-14 days
Additional Information:
Deficiency of 7-dehydrocholesterol reductase leads to accumulation of this compound in Smith-Lemli-Opitz Syndrome.

This laboratory is not eligible for MediCal reimbursement. Specimens on MediCal patients must be charged either to a budget account or paid for in advance in cash.
Synonyms:
- Smith-Lemli-Opitz syndrome
- Dehydrocholesterol,7-

COLLECTION

Sample Type:
EDTA Plasma
Collect:
Lavender top (Green top acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.1 mL plasma
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 48 hours, frozen at -20°C indefinite.

PROCESSING

Test Code:
DHC7
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze at -20°C. Ship frozen to China Basin. Order Quest # 17664X
Preferred Volume:
1 mL plasma
Minimum Volume:
0.1 mL plasma
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 48 hours, frozen at -20°C indefinite.
RESULT INTERPRETATION

Reference Interval:
See Additional Information

Additional Information:
Deficiency of 7-dehydrocholesterol reductase leads to accumulation of this compound in Smith-Lemli-Opitz Syndrome.

This laboratory is not eligible for MediCal reimbursement. Specimens on MediCal patients must be charged either to a budget account or paid for in advance in cash.

ADMINISTRATIVE

CPT Codes:
82542-90

LOINC Codes:
33275-9

COMPLETE VIEW

Available Stat:
No

Test Code:
DHC7

Performing Lab:
Quest

Sendout:
Yes

Methodology:
GCMS

Collect:
Lavender top (Green top acceptable)

Amount to Collect:
2 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.1 mL plasma

Specimen Preparation:
Freeze at -20C. Ship frozen to China Basin. Order Quest # 17664X

Reference Interval:
See Additional Information

Synonyms:
- Smith-Lemli-Opitz syndrome
- Dehydrocholesterol,7-

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 48 hours, frozen at -20C indefinite.

Reported:
Batched 1-2 times per week. Turnaround 7-14 days

Additional Information:
Deficiency of 7-dehydrocholesterol reductase leads to accumulation of this compound in Smith-Lemli-Opitz Syndrome.

This laboratory is not eligible for MediCal reimbursement. Specimens on MediCal patients must be charged either to a budget account or paid for in advance in cash.
CPT Codes:
82542-90
LOINC Codes:
33275-9
ABL Kinase domain mutations
KDSQ

ORDERING

Approval Required:
Yes, if not ordered by Adult or Pediatric Hematology-Oncology

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed, Monday or Wednesday, day shift only

Methodology:
RT-PCR and DNA sequencing

Reported:
7-10 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Treatment of CML and ALL patients positive for BCR-ABL chromosomal translocation is aimed at the eradication of tumor cells carrying the BCR-ABL oncoprotein, which has increased tyrosine kinase activity. Treatment with Gleevec (imatinib mesylate) or other tyrosine kinase inhibitors (TKI's) may result in drug resistance caused by the development of mutations within the ABL kinase domain (KD) of the BCR-ABL oncoprotein. Early identification of these mutations, for example as a patient is monitored for minimal residual disease by PCR, may prevent clinical relapse and allow physicians to use alternative TKI's that could potentially eradicate leukemic clones carrying a specific ABL KD mutation. Specific ABL KD mutations have been determined to be either sensitive or resistant to imatinib, dasatinib, or iotinin and therefore treatment modalities can be tailored based on a patient's specific mutation.

This test will detect leukemic clones carrying a BCR-ABL translocation at a level of 1 in 100,000 cells and will identify ABL KD mutations in that population when 20% or more of the cells contain the mutation.

The result is reported as negative or positive with the type of ABL KD mutation detected and whether it is present as a clonal expansion or on a background on non-mutated cells. Results are best interpreted during follow-up monitoring of the BCR-ABL to ABL ratio using the Quantitative BCR-ABL assay.

This test was developed and it's performance characteristics determined by the Clinical Laboratories at the UCSF Medical Center. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- BCR-ABL mutations
- BCR/ABL mutations
- CML
- Chronic myelogenous leukemia
- Gleevec resistance
- Iminitab mesylate resistance
- Philadelphia chromosome
- PH1 chromosome
- breakpoint cluster region

COLLECTION

Sample Type:
EDTA Whole blood or bone marrow

Collect:
Lavender top
Amount to Collect:
- Blood: 5 mL
- Marrow: 2 mL

Preferred Volume:
- Blood: 5 mL
- Marrow: 2 mL

Minimum Volume:
- Blood: 2 mL
- Marrow: 1 mL

Remarks:
Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):
Refrigerated 3 days.

Unacceptable Conditions:
Samples collected in heparin

PROCESSING

Test Code:
KDSQ

Test Group:
BCRABL

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge. Refrigerate sample, DO NOT freeze.

Preferred Volume:
- Blood: 5 mL
- Marrow: 2 mL

Minimum Volume:
- Blood: 2 mL
- Marrow: 1 mL

Unacceptable Conditions:
Samples collected in heparin

Stability (from collection to initiation):
Refrigerated 3 days.

RESULT INTERPRETATION

Reference Interval:
None detected

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Treatment of CML and ALL patients positive for BCR-ABL chromosomal translocation is aimed at the eradication of tumor cells carrying the BCR-ABL oncoprotein, which has increased tyrosine kinase activity. Treatment with Gleevec (imatinib mesylate) or other tyrosine kinase inhibitors (TKI's) may result in drug resistance caused by the development of mutations within the ABL kinase domain (KD) of the BCR-ABL oncoprotein. Early identification of these mutations, for example as a patient is monitored for minimal residual disease by PCR, may prevent clinical relapse and allow physicians to use alternative TKI's that could potentially eradicate leukemic clones carrying a specific ABL KD mutation. Specific ABL KD mutations have been determined to be either sensitive or resistant to imatinib, dasatinib, or ilotinib and therefore treatment modalities can be tailored based on a patient's specific mutation.

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or on a background on non-mutated cells. Results are best interpreted during follow-up monitoring of the BCR-ABL to ABL ratio using the Quantitative BCR-ABL assay.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the UCSF Medical Center. It has not been cleared or approved by the U.S. Food and Drug Administration.

**ADMINISTRATIVE**

CPT Codes:
- 81170

LDT or Modified FDA:
- Yes

**COMPLETE VIEW**

Approval Required:
- Yes, if not ordered by Adult or Pediatric Hematology-Oncology

Available Stat:
- No

Test Code:
- KDSQ

Test Group:
- BCRABL

Performing Lab:
- Medical Genomics - Molecular Diagnostics

Performed:
- Run 1x per week as needed, Monday or Wednesday, day shift only

Methodology:
- RT-PCR and DNA sequencing

Remarks:
- Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
- Lavender top

Amount to Collect:
- Blood: 5 mL
- Marrow: 2 mL

Sample Type:
- EDTA Whole blood or bone marrow

Preferred Volume:
- Blood: 5 mL
- Marrow: 2 mL

Minimum Volume:
- Blood: 2 mL
- Marrow: 1 mL

Unacceptable Conditions:
- Samples collected in heparin

Specimen Preparation:
- Do not centrifuge. Refrigerate sample, DO NOT freeze.

Reference Interval:
- None detected

Synonyms:
- BCR-ABL mutations
- BCR/ABL mutations
- CML
- Chronic myelogenous leukemia
- Gleevec resistance
- Imatinib mesylate resistance
- Philadelphia chromosome
- PH1 chromosome
- breakpoint cluster region

**Stability (from collection to initiation):**
Refrigerated 3 days.

**Reported:**
7-10 days

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Treatment of CML and ALL patients positive for BCR-ABL chromosomal translocation is aimed at the eradication of tumor cells carrying the BCR-ABL oncoprotein, which has increased tyrosine kinase activity. Treatment with Gleevec (imatinib mesylate) or other tyrosine kinase inhibitors (TKI's) may result in drug resistance caused by the development of mutations within the ABL kinase domain (KD) of the BCR-ABL oncoprotein. Early identification of these mutations, for example as a patient is monitored for minimal residual disease by PCR, may prevent clinical relapse and allow physicians to use alternative TKI's that could potentially eradicate leukemic clones carrying a specific ABL KD mutation. Specific ABL KD mutations have been determined to be either sensitive or resistant to imatinib, dasatinib, or ilotinib and therefore treatment modalities can be tailored based on a patient's specific mutation.

This test will detect leukemic clones carrying a BCR-ABL translocation at a level of 1 in 100,000 cells and will identify ABL KD mutations in that population when 20% or more of the cells contain the mutation.

The result is reported as negative or positive with the type of ABL KD mutation detected and whether it is present as a clonal expansion or on a background on non-mutated cells. Results are best interpreted during follow-up monitoring of the BCR-ABL to ABL ratio using the Quantitative BCR-ABL assay.

This test was developed and it's performance characteristics determined by the Clinical Laboratories at the UCSF Medical Center. it has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
81170

**LDT or Modified FDA:**
Yes
ABL1 Break Apart Rearrangement FISH
BABL1R, ABL1R

ORDERING

Performing Lab:
Cytogenetics

Performed:
Mon - Fri 9 am to 5 pm

Methodology:
FISH

Reported:
7~14 days

Synonyms:
- ABL1 FISH
- 9q34 BA FISH
- BABL1R
- ABL1R

COLLECTION

Sample Type:
Blood, bone marrow aspirate, bone marrow core

Collect:
Blood: Dark Green top Sodium Heparin tube
Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Stability (from collection to initiation):
2 days

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
- Blood: BABL1R
- Bone marrow: ABL1R

Performing Lab:
Cytogenetics

Preferred Volume:
- Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen.

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

---

**CPT Codes:**
- 88271x2, 88275x1

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**Test Code:**
- Blood: BABL1R
- Bone marrow: ABL1R

**Performing Lab:**
- Cytogenetics

**Performed:**
- Mon - Fri 9 am to 5 pm

**Methodology:**
- FISH

**Collect:**
- Blood: Dark Green top Sodium Heparin tube
- Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Sample Type:**
- Blood, bone marrow aspirate, bone marrow core

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen.

**Synonyms:**
- ABL1 FISH
- 9q34 BA FISH
- BABL1R
- ABL1R

---

**Storage/Transport Temperature:**
- Room temperature

**Stability (from collection to initiation):**
2 days
**Reported:**
7~14 days
**CPT Codes:**
88271x2, 88275x1

Test information subject to change
ABL2 Break Apart Rearrangement FISH
BABL2R, ABL2R

ORDERING

Performing Lab:
Cytogenetics

Performed:
Mon-Fri 9 am to 5 pm

Methodology:
FISH

Reported:
7-14 days

Synonyms:
- BABL2R
- ABL2R
- ABL2 1q25 BA FISH

COLLECTION

Sample Type:
Blood, bone marrow aspirate, bone marrow core

Collect:
Blood: Dark Green Top Sodium Heparin tube for Blood
Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

Amount to Collect:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Stability (from collection to initiation):
2 days

Storage/Transport Temperature:
Room Temperature

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen

PROCESSING

Test Code:
Blood: BABL2R
Bone marrow ABL2R

Performing Lab:
Cytogenetics

Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen

Stability (from collection to initiation):
- 2 days

Storage/Transport Temperature:
- Room Temperature

ADMINISTRATIVE

CPT Codes:
- 88271x2, 88275x1

COMPLETE VIEW

Test Code:
- Blood: BABL2R
- Bone marrow ABL2R

Performing Lab:
- Cytogenetics

Performed:
- Mon-Fri 9 am to 5 pm

Methodology:
- FISH

Collect:
- Blood: Dark Green Top Sodium Heparin tube for Blood
- Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:
- Blood, bone marrow aspirate, bone marrow core

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen

Synonyms:
- BABL2R
- ABL2R
- ABL2 1q25 BA FISH

Storage/Transport Temperature:
- Room Temperature

Stability (from collection to initiation):
- 2 days

Reported:
- 7-14 days
CPT Codes:
88271x2, 88275x1

Test information subject to change
ABO and Rh Typing Panel
ABRH

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay and MtZ Blood Banks

Performed:
Test available 24 hours per day 7 days per week

Reported:
STAT 1 hour, ASAP 2 hours Routine 4 hours

Additional Information:
When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported.

Reflex Testing:
Cord blood: If baby and mother are both Rh Negative on initial testing, weak D testing will be automatically performed on the cord sample and charged for.

Synonyms:
- Blood grouping
- Blood typing
- Rh typing
- cord blood tests

COLLECTION

Sample Type:
EDTA whole blood

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code:
ABRH

Test Group:
ABO / Rh

Performing Lab:
Parnassus, Mission Bay and MtZ Blood Banks

Specimen Preparation:
Maintain samples at room temperature and provide to Blood Bank asap.

Preferred Volume:
Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

Specimen Preparation:
Maintain samples at room temperature and provide to Blood Bank asap.

Synonyms:
- Blood grouping
- Blood typing
- Rh typing
- cord blood tests

Reported:
STAT 1 hour, ASAP 2 hours Routine 4 hours
Reflex Testing:
  Cord blood: If baby and mother are both Rh Negative on initial testing, weak D testing will be automatically performed on the cord sample and charged for.

Additional Information:
  When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported.

CPT Codes:
  86900, 86901

LOINC Codes:
  34530-6
**ABO only**

**ABO**

### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus, Mission Bay and MtZ Blood Banks

**Performed:**
- Test available 24 hours per day 7 days per week

**Reported:**
- STAT 1 hour, ASAP 2 hours Routine 4 hours

**Additional Information:**
When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported. Samples must be signed and dated by the person who obtained the sample.

**Synonyms:**
- Blood grouping
- Blood typing
- cord blood tests

### COLLECTION

**Sample Type:**
- EDTA whole blood

**Collect:**
- Lavender top (6 mL size preferred)

**Amount to Collect:**
- 6 mL blood

**Preferred Volume:**
- 6 mL blood

**Minimum Volume:**
- 3 mL blood

**Remarks:**
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Unacceptable Conditions:**
- Unsigned, mislabeled, unlabeled or hemolyzed sample.

### PROCESSING

**Test Code:**
- ABO

**Test Group:**
- ABO / Rh

**Performing Lab:**
- Parnassus, Mission Bay and MtZ Blood Banks

**Specimen Preparation:**
- Maintain samples at room temperature and provide to Blood Bank asap.

**Preferred Volume:**
- 6 mL blood

**Minimum Volume:**
- 3 mL blood
Unacceptable Conditions:

- Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:

When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported. Samples must be signed and dated by the person who obtained the sample.

ADMINISTRATIVE

CPT Codes:

- 86900

COMPLETE VIEW

Available Stat:

- Yes

Test Code:

- ABO

Test Group:

- ABO / Rh

Performing Lab:

- Parnassus, Mission Bay and MtZ Blood Banks

Performed:

- Test available 24 hours per day 7 days per week

Remarks:

- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:

- Lavender top (6 mL size preferred)

Amount to Collect:

- 6 mL blood

Sample Type:

- EDTA whole blood

Preferred Volume:

- 6 mL blood

Minimum Volume:

- 3 mL blood

Unacceptable Conditions:

- Unsigned, mislabeled, unlabeled or hemolyzed sample.

Specimen Preparation:

- Maintain samples at room temperature and provide to Blood Bank asap.

Synonyms:

- Blood grouping
- Blood typing
- cord blood tests

Reported:

- STAT 1 hour, ASAP 2 hours Routine 4 hours

Additional Information:

When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported. Samples must be signed and dated by the person who obtained the sample.

CPT Codes:

- 86900
ABB/Rh Confirmation
CHEK

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Blood Banks
Performed:
test available 24 hours a day 7 days a week
Reported:
Stat 1 hour, Routine 4 hours
Additional Information:
See the Lab Manual's Transfusion Medicine Guide for additional information.
Reflex Testing:
An in-date Type and Screen specimen is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate ABO/Rh confirmation test, the Blood Bank will reflexively convert that order to a Type and Screen test (test code TYSC).

Synonyms:
- Check specimen
- check sample

COLLECTION

Sample Type:
EDTA Whole blood
Collect:
Lavender top (6 mL)
Amount to Collect:
See Preferred Volume.
Preferred Volume:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Volume Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
<td>Full Microtainer (0.8 mL)</td>
</tr>
<tr>
<td>4 mo - 1 year</td>
<td>1 mL</td>
</tr>
<tr>
<td>1-18 years</td>
<td>2 mL (1 mL OK for small children)</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>2 mL</td>
</tr>
</tbody>
</table>
Minimum Volume:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Volume Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
<td>Full Microtainer (0.8 mL)</td>
</tr>
<tr>
<td>&gt; 4 mo</td>
<td>1 mL</td>
</tr>
</tbody>
</table>
Remarks:
Must be drawn during a separate phlebotomy from the initial Type and Screen specimen.
Release of order within APeX is performed by Blood Bank staff.
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code:
CHEK
Performing Lab:
Parnassus & Mission Bay Blood Banks
Preferred Volume:
- <4 mo: Full Microtainer (0.8 mL)
- 4 mo - 1 year: 1 mL
- 1 - 18 years: 2 mL (1 mL OK for small children)
- >18 years: 2 mL

Minimum Volume:
- <4 mo: Full Microtainer (0.8 mL)
- >4 mo: 1 mL

Unacceptable Conditions:
- Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:
See the Lab Manual's Transfusion Medicine Guide for additional information.

ADMINISTRATIVE

CPT Codes:
- 86900, 86901

COMPLETE VIEW

Available Stat:
- Yes

Test Code:
- CHEK

Performing Lab:
- Parnassus & Mission Bay Blood Banks

Performed:
- Test available 24 hours a day, 7 days a week

Remarks:
- Must be drawn during a separate phlebotomy from the initial Type and Screen specimen.
- Release of order within APeX is performed by Blood Bank staff.
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
- Lavender top (6 mL)

Amount to Collect:
- See Preferred Volume.

Sample Type:
- EDTA Whole blood

Preferred Volume:
- <4 mo: Full Microtainer (0.8 mL)
- 4 mo - 1 year: 1 mL
- 1 - 18 years: 2 mL (1 mL OK for small children)
- >18 years: 2 mL

Minimum Volume:
- <4 mo: Full Microtainer (0.8 mL)
- >4 mo: 1 mL

Unacceptable Conditions:
- Unsigned, mislabeled, unlabeled or hemolyzed sample.

Synonyms:
- Check specimen
• check sample

**Reported:**
- Stat 1 hour, Routine 4 hours

**Reflex Testing:**
An in-date Type and Screen specimen is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate ABO/Rh confirmation test, the Blood Bank will reflexively convert that order to a Type and Screen test (test code TYSC).

**Additional Information:**
See the Lab Manual's Transfusion Medicine Guide for additional information.

**CPT Codes:**
- 86900, 86901
Acanthamoeba Culture and smear
P417

ORDERING

Performing Lab:
Microbiology

Performed:
Monday-Friday day shift

Methodology:
Culture, and exam of smear by microscopy

Reported:
Culture: 7-10 days, Smear: 1-3 days

Additional Information:
A culture for Acanthamoeba will be performed on all specimen types.

An additional charge is billed for the smear.

For ophthalmology specimens, a smear is stained and examined when a slide is received, and when contact lens solution or contact lens case with fluid or lens is received.

Synonyms:
- Acanthamoeba, Naegleria, Balamuthia, Amoeba

COLLECTION

Sample Type:
Corneal scraping/biopsy
Contact lens solution
Contact lens case with fluid or lens
CSF
Brain tissue
Skin abscess

Collect:
Corneal scraping/biopsy: Non-nutrient agar plate
Contact lens solution: Sterile container
Contact lens case with solution or lens
CSF/Tissue: CSF tube or sterile collection tube

Amount to Collect:
Contact lens solution: 0.5 mL
CSF: 5 mL
Tissue: approximately 6 mm

Preferred Volume:
Contact lens solution: 0.5 mL
CSF: 5 mL
Tissue: approximately 6 mm

Minimum Volume:
Contact lens solution: 0.5 mL
CSF: 2 mL
Tissue: 3 mL

Remarks:
Transport specimens to Microbiology as soon as possible.

Corneal scrapings or biopsy: Place specimen directly onto the center of a non-nutrient agar plate. Label the plates at the edge so as not to interfere with microscopic analysis. Tape the plate closed and transport in a sealed specimen bag. If a stain is requested, submit a slide with a centered dime-sized smear, frosted side face up, labeled, and in a slide transport container.

Contact lens solution: Submit in original container or sterile container.
Contact lens case: Submit with fluid or with lenses.

Unacceptable Conditions:
Dry contact lens case without contact lens

PROCESSING

Test Code:
P417
Test Group:
Parasitology
Performing Lab:
Microbiology
Specimen Preparation:
Store sample at room temperature. Notify a parasitologist or CLS when specimen arrives.

Preferred Volume:
- Contact lens solution: 0.5 mL
- CSF: 5 mL
- Tissue: approximately 6 mm

Minimum Volume:
- Contact lens solution: 0.5 mL
- CSF: 2 mL
- Tissue: 3 mL

Unacceptable Conditions:
Dry contact lens case without contact lens

RESULT INTERPRETATION

Reference Interval:
No Acanthamoeba spp. present/isolated
No Parasites Seen

Additional Information:
A culture for Acanthamoeba will be performed on all specimen types.

An additional charge is billed for the smear.

For ophthalmology specimens, a smear is stained and examined when a slide is received, and when contact lens solution or contact lens case with fluid or lens is received.

ADMINISTRATIVE

CPT Codes:
Culture: 87081, Smear: 87207

COMPLETE VIEW

Test Code:
P417
Test Group:
Parasitology
Performing Lab:
Microbiology
Performed:
Monday-Friday day shift
Methodology:
Culture, and exam of smear by microscopy
Remarks:
Transport specimens to Microbiology as soon as possible.

Corneal scrapings or biopsy: Place specimen directly onto the center of a non-nutrient agar plate. Label the plates at the edge so as not to interfere with microscopic analysis. Tape the plate closed and transport in a sealed specimen bag. If a stain is requested, submit a slide with a centered dime-sized smear, frosted side face up, labeled, and in a slide transport container.

Contact lens solution: Submit in original container or sterile container.

Contact lens case: Submit with fluid or with lenses.

Collect:
- Corneal scraping/biopsy: Non-nutrient agar plate
- Contact lens solution: Sterile container
- Contact lens case with solution or lens
- CSF/Tissue: CSF tube or sterile collection tube

Amount to Collect:
- Contact lens solution: 0.5 mL
- CSF: 5 mL
- Tissue: approximately 6 mm

Sample Type:
- Corneal scraping/biopsy
- Contact lens solution
- Contact lens case with fluid or lens
- CSF
- Brain tissue
- Skin abscess

Preferred Volume:
- Contact lens solution: 0.5 mL
- CSF: 5 mL
- Tissue: approximately 6 mm

Minimum Volume:
- Contact lens solution: 0.5 mL
- CSF: 2 mL
- Tissue: 3 mL

Unacceptable Conditions:
- Dry contact lens case without contact lens

Specimen Preparation:
- Store sample at room temperature. Notify a parasitologist or CLS when specimen arrives.

Reference Interval:
- No Acanthamoeba spp. present/isolated
- No Parasites Seen

Synonyms:
- Acanthamoeba, Naegleria, Balamuthia, Amoeba

Reported:
- Culture: 7-10 days, Smear: 1-3 days

Additional Information:
- A culture for Acanthamoeba will be performed on all specimen types.
- An additional charge is billed for the smear.

For ophthalmology specimens, a smear is stained and examined when a slide is received, and when contact lens solution or contact lens case with fluid or lens is received.

CPT Codes:
- Culture: 87081, Smear: 87207
Accuratio Parathyroid Hormone
MOLT

ORDERING

Ordering Recommendations:
Conventional "intact" PTH assays detect both 1-84 PTH and 7-84 PTH fragment. Both 1-84 PTH and 7-84 PTH are secreted by the parathyroid gland. According to the manufacturer of the Accuratio PTH assay (Scantibodies Clinical Laboratories), the Accuratio PTH assay can distinguish between 1-84 PTH and 7-84 PTH. Functionally, 7-84 PTH may cause the body to do the opposite of 1-84 PTH with respect to serum calcium, osteoclast formation, bone resorption, bone turnover, and bone formation. Thus, 7-84 PTH may have an inverse biological activity compared to that of 1-84 PTH. 1-84 PTH activates adenylate cyclase and is termed by the manufacturer of the Accuratio PTH assay as Cyclase Activating PTH (CAP®) whereas 7-84 PTH does not activate adenylate cyclase and is termed Cyclase Inactive PTH (CIP®). The fact that 7-84 PTH does not activate adenylate cyclase is suggested by evidence that 7-84 PTH may operate through a PTH C-terminal receptor (that may not activate adenylate cyclase); whereas, 1-84 PTH operates through the classical PTH/PTHrp receptor that does signal through adenylate cyclase. The Accuratio PTH assay involves two assays: One of the assays detects both 1-84 PTH and 7-84 PTH and is similar to conventional "intact" PTH assays. A separate assay (CAP®) detects only 1-84 PTH. The result of the 1-84 PTH assay is subtracted from the result of the "intact" PTH assay that detects both 1-84 PTH and 7-84 PTH to calculate the 7-84 PTH (CIP®) value. The CAP® value (1-84 PTH) is divided by the CIP® value (7-84 PTH) to calculate the CAP®/CIP® ratio.

Available Stat:
No
Performing Lab:
Performed by Scantibodies Clinical Labs via Mayo
Synonyms:
- Accuratio PTH

COLLECTION

Sample Type:
EDTA plasma
Collect:
Lavender top (EDTA)
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL EDTA plasma
Minimum Volume:
2 mL EDTA Plasma
Unacceptable Conditions:
- Non-EDTA sample received

PROCESSING

Test Code:
MOLT
Sendout:
Yes
Performing Lab:
Performed by Scantibodies Clinical Labs via Mayo
Specimen Preparation:
Spin down and aliquot 3 mL of plasma and freeze at -20ºC

NOTE: Send frozen sample to China Basin Chemistry supervisor DO NOT give sample to Sendouts
Preferred Volume:
3 mL EDTA plasma
Minimum Volume:
RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:
- Total PTH Reference Range: 14.0-66.0 pg/mL
- Cyclase active PTH (CAP; 1-84 PTH): 5.0-39.0 pg/mL
- Cyclase inactive PTH (CIP; 7-84 PTH): 2.5-29.0 pg/mL
- CAP/CIP ratio: 1.1-6.9

ADMINISTRATIVE

CPT Codes:
83970-90 x2

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Conventional "intact" PTH assays detect both 1-84 PTH and 7-84 PTH fragment. Both 1-84 PTH and 7-84 PTH are secreted by the parathyroid gland. According to the manufacturer of the Accuratio PTH assay (Scantibodies Clinical Laboratories), the Accuratio PTH assay can distinguish between 1-84 PTH and 7-84 PTH. Functionally, 7-84 PTH may cause the body to do the opposite of 1-84 PTH with respect to serum calcium, osteoclast formation, bone resorption, bone turnover, and bone formation. Thus, 7-84 PTH may have an inverse biological activity compared to that of 1-84 PTH. 1-84 PTH activates adenylate cyclase and is termed by the manufacturer of the Accuratio PTH assay as Cyclase Activating PTH (CAP®) whereas 7-84 PTH does not activate adenylate cyclase and is termed Cyclase Inactive PTH (CIP®). The fact that 7-84 PTH does not activate adenylate cyclase is suggested by evidence that 7-84 PTH may operate through a PTH C-terminal receptor (that may not activate adenylate cyclase); whereas, 1-84 PTH operates through the classical PTH/PTHrp receptor that does signal through adenylate cyclase. The Accuratio PTH assay involves two assays: One of the assays detects both 1-84 PTH and 7-84 PTH and is similar to conventional "intact" PTH assays. A separate assay (CAP®) detects only 1-84 PTH, The result of the 1-84 PTH assay is subtracted from the result of the "intact" PTH assay that detects both 1-84 PTH and 7-84 PTH to calculate the 7-84 PTH (CIP®) value. The CAP® value (1-84 PTH) is divided by the CIP® value (7-84 PTH) to calculate the CAP®/CIP® ratio.

Test Code:
MOLT

Performing Lab:
Performed by Scantibodies Clinical Labs via Mayo

Sendout:
Yes

Collect:
Lavender top (EDTA)

Amount to Collect:
6 mL blood

Sample Type:
EDTA plasma

Preferred Volume:
3 mL EDTA plasma

Minimum Volume:
2 mL EDTA Plasma

Unacceptable Conditions:
Non-EDTA sample received

Specimen Preparation:
Spin down and aliquot 3 mL of plasma and freeze at -20°C

**NOTE:** Send frozen sample to China Basin Chemistry supervisor DO NOT give sample to Sendouts

**Units:**
- pg/mL

**Reference Interval:**
- Total PTH Reference Range: 14.0-66.0 pg/mL
- Cyclase active PTH (CAP; 1-84 PTH): 5.0-39.0 pg/mL
- Cyclase inactive PTH (CIP; 7-84 PTH): 2.5-29.0 pg/mL
- CAP/CIP ratio: 1.1-6.9

**Synonyms:**
- Accuratio PTH

**CPT Codes:**
- 83970-90 x2
Acetaminophen
AAPH

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: 24-hours per day, 7-days per week
Methodology: Turbidimetric inhibition immunoassay (Beckman DxC800)
Reported: STAT 1 hour, Routine 1-3 days
Additional Information:
  In suspected intoxication, at least 4 hours must have elapsed post-ingestion before a serum level can assist in determining the need to initiate N-acetylcysteine therapy; earlier levels are uninterpretable for this purpose. For additional emergency information, you may call the San Francisco regional poison center, 1-800-876-4766 (from UCSF dial 47-28600)

  Note: some monoclonal proteins may cause falsely low acetaminophen results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the acetaminophen assay in some cases. Testing for acetaminophen levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected.

Synonyms:
  • Tylenol
  • Datril

COLLECTION

Sample Type: Serum
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen 1 week

PROCESSING

Test Code: AAPH
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen 1 week

RESULT INTERPRETATION

Units:
  mg/L
Reference Interval:
  Therapeutic: 10-20 mg/L
  Toxic: > 150 mg/L (4 hours post ingestion)
Critical Values:
  >50 mg/L
Additional Information:
  In suspected intoxication, at least 4 hours must have elapsed post-ingestion before a serum level can assist in determining the need to initiate N-acetylcysteine therapy; earlier levels are uninterpretable for this purpose. For additional emergency information, you may call the San Francisco regional poison center, 1-800-876-4766 (from UCSF dial 47-28600)

Note: some monoclonal proteins may cause falsely low acetaminophen results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the acetaminophen assay in some cases. Testing for acetaminophen levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected.

ADMINISTRATIVE

CPT Codes:
  80329
LOINC Codes:
  3298-7

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  AAPH
Performing Lab:
  Parnassus & Mission Bay Chemistry
Performed:
  24-hours per day, 7-days per week
Methodology:
  Turbidimetric inhibition immunoassay (Beckman DxC800)
Collect:
  Gold top or Light Green top
Amount to Collect:
  1 mL blood
Sample Type:
  Serum
Preferred Volume:
  0.5 mL serum
Minimum Volume:
  0.2 mL serum
Units:
  mg/L
Reference Interval:
  Therapeutic: 10-20 mg/L
  Toxic: > 150 mg/L (4 hours post ingestion)
Critical Values:
>50 mg/L

**Synonyms:**
- Tylenol
- Datril

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen 1 week

**Reported:**
STAT 1 hour, Routine 1-3 days

**Additional Information:**
In suspected intoxication, at least 4 hours must have elapsed post-ingestion before a serum level can assist in determining the need to initiate N-acetylcysteine therapy; earlier levels are uninterpretable for this purpose. For additional emergency information, you may call the San Francisco regional poison center, 1-800-876-4766 (from UCSF dial 47-28600)

Note: some monoclonal proteins may cause falsely low acetaminophen results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the acetaminophen assay in some cases. Testing for acetaminophen levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected.

**CPT Codes:**
80329

**LOINC Codes:**
3298-7
Acetylcholine Receptor Binding Antibody (ACRA)

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Quest
- **Methodology:** Radiobinding assay
- **Reported:** Test performed Monday-Friday. Turnaround time: 2-5 days.
- **Synonyms:**
  - Myasthenia gravis

**COLLECTION**

- **Sample Type:** Serum
- **Collect:** Red top
- **Amount to Collect:** 2 mL blood
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.2 mL serum
- **Stability (from collection to initiation):** Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20°C 1 year.
- **Unacceptable Conditions:** Hemolysis, lipemia
- **Rejection Criteria:** Hemolysis, lipemia

**PROCESSING**

- **Test Code:** ACRA
- **Sendout:** Yes
- **Performing Lab:** Quest
- **Specimen Preparation:** Refrigerate Serum. Order Quest #110346P
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.2 mL serum
- **Unacceptable Conditions:** Hemolysis, lipemia
- **Rejection Criteria:** Hemolysis, lipemia
Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20C 1 year.

RESULT INTERPRETATION

Units:
nmol/L
Reference Interval:
  Negative: <= 0.30 nmol/L
  Equivocal: 0.31-0.49 nmol/L
  Positive: >= 0.50 nmol/L

ADMINISTRATIVE

CPT Codes:
  83519-90
LOINC Codes:
  11034-6

COMPLETE VIEW

Available Stat:
  No
Test Code:
  ACRA
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Radiobinding assay
Collect:
  Red top
Amount to Collect:
  2 mL blood
Sample Type:
  Serum
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.2 mL serum
Rejection Criteria:
  Hemolysis, lipemia
Unacceptable Conditions:
  Hemolysis, lipemia
Specimen Preparation:
  Refrigerate Serum. Order Quest #110346P
Units:
  nmol/L
Reference Interval:
  Negative: <= 0.30 nmol/L
  Equivocal: 0.31-0.49 nmol/L
  Positive: >= 0.50 nmol/L
Synonyms:
  • Myasthenia gravis
Stability (from collection to initiation):
   Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20C 1 year.

 Reported:
   Test performed Monday-Friday. Turnaround time: 2-5 days.

CPT Codes:
   83519-90

LOINC Codes:
   11034-6
Acetylcholine Receptor Blocking Antibody
ACRB

ORDERING

Performing Lab:
Quest
Methodology:
Radioimmunoassay
Reported:
4-7 days
Additional Information:
Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR blocking autoantibodies prevent interaction of binding antibodies with the AChR. Fewer than 1% of patients have blocking antibodies without binding antibodies. Blocking antibodies are present in about 50% of patients with MG, but rare in other conditions. Therefore, blocking antibodies have utility in ruling out a possible false positive binding assay and detecting the rare patient without AChR binding antibodies.

Synonyms:
- Myasthenia Gravis

COLLECTION

Sample Type:
Serum
Collect:
Gold or red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature: 14 days
Refrigerated: 14 days
Frozen: 30 days
Rejection Criteria:
Gross Hemolysis, Grossly lipemic, Microbially contaminated

PROCESSING

Test Code:
ACRB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 34459.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Rejection Criteria:
Gross Hemolysis, Grossly lipemic, Microbially contaminated

**Stability (from collection to initiation):**
- Room temperature: 14 days
- Refrigerated: 14 days
- Frozen: 30 days

### RESULT INTERPRETATION

**Units:**
- % of inhibition

**Reference Interval:**
- <15%

**Additional Information:**
Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR blocking autoantibodies prevent interaction of binding antibodies with the AChR. Fewer than 1% of patients have blocking antibodies without binding antibodies. Blocking antibodies are present in about 50% of patients with MG, but rare in other conditions. Therefore, blocking antibodies have utility in ruling out a possible false positive binding assay and detecting the rare patient without AChR binding antibodies.

### ADMINISTRATIVE

**CPT Codes:**
- 83519

**LOINC Codes:**
- 11561-8

### COMPLETE VIEW

**Test Code:**
- ACRB

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Radioimmunoassay

**Collect:**
- Gold or red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Rejection Criteria:**
- Gross Hemolysis, Grossly lipemic, Microbially contaminated

**Specimen Preparation:**
- Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 34459.

**Units:**
- % of inhibition

**Reference Interval:**
- <15%

**Synonyms:**

Test information subject to change.
Myasthenia Gravis

Stability (from collection to initiation):

- Room temperature: 14 days
- Refrigerated: 14 days
- Frozen: 30 days

Reported:

- 4-7 days

Additional Information:

Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR blocking autoantibodies prevent interaction of binding antibodies with the AChR. Fewer than 1% of patients have blocking antibodies without binding antibodies. Blocking antibodies are present in about 50% of patients with MG, but rare in other conditions. Therefore, blocking antibodies have utility in ruling out a possible false positive binding assay and detecting the rare patient without AChR binding antibodies.

CPT Codes:

- 83519

LOINC Codes:

- 11561-8
Acetylcholine Receptor Modulating Antibody
ACRM

ORDERING

Performing Lab: Quest
Methodology: Radiobinding Assay
Reported: 4-7 days

Additional Information:
Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR modulating antibodies cross-link AChR molecules on cell surface, promoting internalization, and decreasing AChR surface density. The AChR binding and modulating antibody assays have similar sensitivities, but performing them together increases sensitivity of antibody detection by approximately 5%.

COLLECTION

Sample Type: Serum
Collect: Gold or red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

Stability (from collection to initiation):
Room temperature: 14 days
Refrigerated: 14 days
Frozen: 30 days

Rejection Criteria:
Gross hemolysis, Grossly lipemic, Microbially contaminated

PROCESSING

Test Code: ACRM
Sendout: Yes
Performing Lab: Quest

Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 26474.

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Gross hemolysis, Grossly lipemic, Microbially contaminated

Stability (from collection to initiation):
Room temperature: 14 days
Refrigerated: 14 days
Frozen: 30 days

RESULT INTERPRETATION

Units:
% binding inhibition

Reference Interval:
<32%

Additional Information:
Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR modulating antibodies cross-link AChR molecules on cell surface, promoting internalization, and decreasing AChR surface density. The AChR binding and modulating antibody assays have similar sensitivities, but performing them together increases sensitivity of antibody detection by approximately 5%.

ADMINISTRATIVE

CPT Codes:
83519
LOINC Codes:
11562-6

COMPLETE VIEW

Test Code:
ACRM
Performing Lab:
Quest
Sendout:
Yes

Methodology:
Radiobinding Assay

Collect:
Gold or red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Gross hemolysis, Grossly lipemic, Microbially contaminated

Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 26474.

Units:
% binding inhibition

Reference Interval:
<32%

Stability (from collection to initiation):
Room temperature: 14 days
Refrigerated: 14 days
Frozen: 30 days

Reported:
4-7 days

**Additional Information:**

Myasthenia Gravis (MG) is an autoimmune neuromuscular disorder characterized by muscle weakness, most commonly due to autoantibody-mediated loss of functional acetylcholine receptors (AChR) in the neuromuscular junction. AChR binding autoantibodies are diagnostic of MG, and are found in 85-90% of MG patients. AChR modulating antibodies cross-link AChR molecules on cell surface, promoting internalization, and decreasing AChR surface density. The AChR binding and modulating antibody assays have similar sensitivities, but performing them together increases sensitivity of antibody detection by approximately 5%.

**CPT Codes:**

83519

**LOINC Codes:**

11562-6
Acid Phosphatase, Total, Serum
ACPT

ORDERING

Ordering Recommendations:
Total acid phosphatase (AP) activity may be useful when evaluating for prostate cancer, Paget's disease, hyperparathyroidism with skeletal involvement, and Gaucher's disease since elevations in AP activity occur in these conditions.

Performing Lab:
ARUP
Performed:
Sun-Sat
Methodology:
Quantitative Enzymatic
Reported:
1-2 days

COLLECTION

Collect:
Plain red.
Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 1 month

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:

PROCESSING

Test Code:
ACPT
ARUP Test Code:
0020544
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Allow specimen to clot completely at room temperature. Transfer 1.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 1 month

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
0.0-4.3 U/L

ADMINISTRATIVE
Ordering Recommendations:
Total acid phosphatase (AP) activity may be useful when evaluating for prostate cancer, Paget's disease, hyperparathyroidism with skeletal involvement, and Gaucher's disease since elevations in AP activity occur in these conditions.

Test Code:
ACPT
ARUP Test Code:
0020544
Performing Lab:
ARUP
Sendout:
Yes
Performed:
Sun-Sat
Methodology:
Quantitative Enzymatic
Collect:
Plain red.
Unacceptable Conditions:
Specimen Preparation:
Allow specimen to clot completely at room temperature. Transfer 1.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Reference Interval:
0.0-4.3 U/L
Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.
Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 1 month
Reported:
1-2 days
CPT Codes:
84060
Activated Partial Thromboplastin Time
PTT

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
24-hours per day, 7-days per week

Methodology:
Mechanical clot detection

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Additional information Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

Per in-house study done 5/2019, the sensitivity of the PTT for detecting factor deficiencies is as follows:

Factor VIII level may prolong the PTT when < 35%
Factor IX level may prolong the PTT when < 29%
Factor XI level may prolong the PTT when < 42%

Therapeutic anticoagulation with unfractionated heparin is generally monitored with the PTT. Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

Patients with lupus anticoagulants being treated with unfractionated heparin are usually monitored with heparin levels, rather than with the PTT. Therapeutic anticoagulation with intravenous direct thrombin inhibitors (i.e. argatroban, bivalirudin) is generally monitored with the PTT. Recommendations for therapy and monitoring are available through the Hematology Consultation services.

For patients not being treated with heparin for whom a sample may be contaminated with heparin, a heparin-neutralizing enzyme can be employed to overcome the effect of up to 2U/mL of unfractionated heparin/mL. Heparin neutralization is not available at Parnassus or Mt. Zion. At Mission Bay, performance of an aPTT after heparin neutralization may rarely be necessary for care of pediatric patients, and is subject to approval by laboratory medicine resident or faculty. In these rare circumstances, heparin neutralization may detect a substantial unexpected coagulopathy when a sample is drawn through a heparinized line. Of note, heparin neutralization reduces coagulation factor levels (typically by approximately 10%, but up to a 30% decrease can occur; internal UCSF study, Jan & Apr 2013). Therefore, heparin neutralization should not be used to detect slight abnormalities of coagulation, small changes in clotting times, or when monitoring anticoagulation.

Synonyms:
- PTT
- aPTT
- Monitoring Anticoagulation
- Monitoring heparin

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

Amount to Collect:
Blue top: 2.7 mL blood
Lt. Blue top: 1.8 mL blood

Note: If hepabsorption is required draw a full Blue top (2.7 mL)

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct’s >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Stability (from collection to initiation):**
If the patient is not on heparin, unopened, uncentrifuged specimens are stable for up to 4 hours at room or refrigerator temperature. If the patient is on un-fractionated heparin, the plasma should be separated within one hour and tested within four hours of collection. Plasma may be frozen at -20C if PTT testing must be delayed, but results may be slightly affected.

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

---

**PROCESSING**

**Test Code:**
- PTT

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Hematology

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Stability (from collection to initiation):**
If the patient is not on heparin, unopened, uncentrifuged specimens are stable for up to 4 hours at room or refrigerator temperature. If the patient is on un-fractionated heparin, the plasma should be separated within one hour and tested within four hours of collection. Plasma may be frozen at -20C if PTT testing must be delayed, but results may be slightly affected.

---

**RESULT INTERPRETATION**

**Units:**
- seconds

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full term infant, 0-5 day old</td>
<td>25.0-60.0 seconds</td>
</tr>
<tr>
<td>Full term infant, 6 days-3 months</td>
<td>24.0-50.0 seconds</td>
</tr>
<tr>
<td>&gt;3 months</td>
<td>21.9 - 32.3 seconds</td>
</tr>
</tbody>
</table>

An infant reference range has not been experimentally determined using our current PTT reagent. The PTTs of normal infants are longer than those of adults due to lower factor levels in the first months of life; the infant reference ranges provided (5 days, 3 months) are based on published literature (Ref: Andrew M et al. Blood 1987; 70-165). This publication further indicates that although trending longer, PTT values at 3 months may not differ statistically from adult values. If there is concern for clotting factor deficiency or inhibitor in an Infant, factor activity assays should be requested if clinically indicated.

**Critical Values:**
- >= 60 seconds if new finding within previous 24 hours. >= 80 seconds are always phoned
Additional Information:

Additional information Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

Per in-house study done 5/2019, the sensitivity of the PTT for detecting factor deficiencies is as follows:

- Factor VIII level may prolong the PTT when < 35%
- Factor IX level may prolong the PTT when < 29%
- Factor XI level may prolong the PTT when < 42%

Therapeutic anticoagulation with unfractionated heparin is generally monitored with the PTT. Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

Patients with lupus anticoagulants being treated with unfractionated heparin are usually monitored with heparin levels, rather than with the PTT. Therapeutic anticoagulation with intravenous direct thrombin inhibitors (i.e. argatroban, bivalirudin) is generally monitored with the PTT. Recommendations for therapy and monitoring are available through the Hematology Consultation services.

For patients not being treated with heparin for whom a sample may be contaminated with heparin, a heparin-neutralizing enzyme can be employed to overcome the effect of up to 2U/mL of unfractionated heparin/mL. Heparin neutralization is not available at Parnassus or Mt. Zion. At Mission Bay, performance of an aPTT after heparin neutralization may rarely be necessary for care of pediatric patients, and is subject to approval by laboratory medicine resident or faculty. In these rare circumstances, heparin neutralization may detect a substantial unexpected coagulopathy when a sample is drawn through a heparinized line. Of note, heparin neutralization reduces coagulation factor levels (typically by approximately 10%, but up to a 30% decrease can occur; internal UCSF study, Jan & Apr 2013). Therefore, heparin neutralization should not be used to detect slight abnormalities of coagulation, small changes in clotting times, or when monitoring anticoagulation.

CPT Codes:

85730

LDT or Modified FDA:

Yes

LOINC Codes:

3173-2

Available Stat:

Yes

Test Code:

PTT

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Hematology

Performed:

24-hours per day, 7-days per week

Methodology:

Mechanical clot detection

Remarks:

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.
Collect:

Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

**Amount to Collect:**

- Blue top: 2.7 mL blood
- Lt. Blue top: 1.8 mL blood

Note: If heparabsorption is required draw a full Blue top (2.7 mL)

**Sample Type:**

Citrated plasma

**Preferred Volume:**

1.5 mL plasma

**Minimum Volume:**

1 mL plasma

**Unacceptable Conditions:**

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Units:**

seconds

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
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**Critical Values:**

>= 60 seconds if new finding within previous 24 hours. >= 80 seconds are always phoned

**Synonyms:**

- PTT
- aPTT
- Monitoring Anticoagulation
- Monitoring heparin

**Stability (from collection to initiation):**

If the patient is not on heparin, unopened, uncentrifuged specimens are stable for up to 4 hours at room or refrigerator temperature. If the patient is on un-fractionated heparin, the plasma should be separated within one hour and tested within four hours of collection. Plasma may be frozen at -20C if PTT testing must be delayed, but results may be slightly affected.

**Reported:**

- STAT 1 hour, Routine 4 hours

**Additional Information:**

Additional information Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

Per in-house study done 5/2019, the sensitivity of the PTT for detecting factor deficiencies is as follows:

- Factor VIII level may prolong the PTT when < 35%
- Factor IX level may prolong the PTT when < 29%
- Factor XI level may prolong the PTT when < 42%

Therapeutic anticoagulation with unfractionated heparin is generally monitored with the PTT. Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

Patients with lupus anticoagulants being treated with unfractionated heparin are usually monitored with heparin levels, rather than with
the PTT. Therapeutic anticoagulation with intravenous direct thrombin inhibitors (i.e. argatroban, bivalirudin) is generally monitored with the PTT. Recommendations for therapy and monitoring are available through the Hematology Consultation services.

For patients not being treated with heparin for whom a sample may be contaminated with heparin, a heparin-neutralizing enzyme can be employed to overcome the effect of up to 2U/mL of unfractionated heparin/mL. Heparin neutralization is not available at Parnassus or Mt. Zion. At Mission Bay, performance of an aPTT after heparin neutralization may rarely be necessary for care of pediatric patients, and is subject to approval by laboratory medicine resident or faculty. In these rare circumstances, heparin neutralization may detect a substantial unexpected coagulopathy when a sample is drawn through a heparinized line. Of note, heparin neutralization reduces coagulation factor levels (typically by approximately 10%, but up to a 30% decrease can occur; internal UCSF study, Jan & Apr 2013). Therefore, heparin neutralization should not be used to detect slight abnormalities of coagulation, small changes in clotting times, or when monitoring anticoagulation.

**CPT Codes:**

85730

**LDT or Modified FDA:**

Yes

**LOINC Codes:**

3173-2
# Acute Lymphoblastic leukemia FISH panel #1

**CYALL1**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Molecular Genetics - Cytogenetics</td>
</tr>
<tr>
<td>Performed:</td>
<td>Monday - Friday 0900-1700</td>
</tr>
<tr>
<td>Methodology:</td>
<td>FISH</td>
</tr>
<tr>
<td>Reported:</td>
<td>1-2 weeks</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>B ALL FISH Panel 1</td>
</tr>
</tbody>
</table>

## COLLECTION

| Sample Type:     | Heparinized whole blood or bone marrow aspirate, Bone marrow core biopsy |
| Collect:         | Blood or Bone marrow aspirate: Dark green top  
|                  | Bone marrow core: Screw top polypropylene tube with transport media |
| Amount to Collect: | Blood: 2 mL  
|                  | Bone marrow: 2 mL  
|                  | Bone marrow biopsy: 2 cm core |
| Preferred Volume: | Blood: 2 mL  
|                  | Bone marrow: 2 mL  
|                  | Bone marrow biopsy: 2 cm core |
| Minimum Volume:  | Blood: 1 mL  
|                  | Bone marrow: 1 mL  
|                  | Bone marrow biopsy: 1 cm core |
| Remarks:         | Mix blood and marrow aspirate well with anticoagulant. Keep all samples at room temperature. |
| Stability (from collection to initiation): | Room temperature 2 days |
| Unacceptable Conditions: | Clotted samples. Samples received unlabeled, refrigerated or frozen. |

## PROCESSING

| Test Code:       | CYALL1 |
| Performing Lab:  | Molecular Genetics - Cytogenetics |
| Specimen Preparation: | Do not centrifuge, refrigerate or freeze samples. |
| Transport to China Basin Cytogenetics asap. |
| Preferred Volume: | |

Test information subject to change.
Blood: 2 mL  
Bone marrow: 2 mL  
Bone marrow biopsy: 2 cm core  

**Minimum Volume:**  
Blood: 1 mL  
Bone marrow: 1 mL  
Bone marrow biopsy: 1 cm core  

**Unacceptable Conditions:**  
Clotted samples. Samples received unlabeled, refrigerated or frozen.  

**Stability (from collection to initiation):**  
Room temperature 2 days  

---

**ADMINISTRATIVE**  

**CPT Codes:**  
88271 x2, 88275 x6  

**LDT or Modified FDA:**  
Yes  

---

**COMPLETE VIEW**  

**Available Stat:**  
No  

**Test Code:**  
CYALL1  

**Performing Lab:**  
Molecular Genetics - Cytogenetics  

**Performed:**  
Monday - Friday 0900-1700  

**Methodology:**  
FISH  

**Remarks:**  
Mix blood and marrow aspirate well with anticoagulant. Keep all samples at room temperature.  

**Collect:**  
Blood or Bone marrow aspirate: Dark green top  
Bone marrow core: Screw top polypropylene tube with transport media  

**Amount to Collect:**  
Blood: 2 mL  
Bone marrow: 2 mL  
Bone marrow biopsy: 2 cm core  

**Sample Type:**  
Heparinized whole blood or bone marrow aspirate, Bone marrow core biopsy  

**Preferred Volume:**  
Blood: 2 mL  
Bone marrow: 2 mL  
Bone marrow biopsy: 2 cm core  

**Minimum Volume:**  
Blood: 1 mL  
Bone marrow: 1 mL  
Bone marrow biopsy: 1 cm core  

**Unacceptable Conditions:**  
Clotted samples. Samples received unlabeled, refrigerated or frozen.  

**Specimen Preparation:**  
Do not centrifuge, refrigerate or freeze samples.  
Transport to China Basin Cytogenetics asap.  

**Synonyms:**
• B ALL FISH Panel 1

Stability (from collection to initiation):
  Room temperature 2 days

Reported:
  1-2 weeks

CPT Codes:
  88271 x2, 88275 x6

LDT or Modified FDA:
  Yes

Test information subject to change
Acute Lymphoblastic leukemia FISH panel #2
CYALL2

ORDERING

Available Stat:
No
Performing Lab:
Molecular Genetics - Cytogenetics
Performed:
Monday - Friday 0900-1700
Methodology:
FISH
Reported:
1-2 weeks
Synonyms:
• B ALL FISH Panel 2

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow aspirate, Bone marrow core biopsy
Collect:
Blood or Bone marrow aspirate: Dark green top
Bone marrow core: Screw top polypropylene tube with transport media
Amount to Collect:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm core
Preferred Volume:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm core
Minimum Volume:
Blood: 1 mL
Bone marrow: 1 mL
Bone marrow biopsy: 1 cm core
Remarks:
Mix blood and marrow aspirate well with anticoagulant.
Keep all samples at room temperature.
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Clotted samples. Samples received unlabeled, refrigerated or frozen.

PROCESSING

Test Code:
CYALL2
Performing Lab:
Molecular Genetics - Cytogenetics
Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples.
Transport to China Basin Cytogenetics asap.

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm core

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm core

**Unacceptable Conditions:**
- Clotted samples. Samples received unlabeled, refrigerated or frozen.

**Stability (from collection to initiation):**
- Room temperature 2 days

### ADMINISTRATIVE

**CPT Codes:**
- 88271 x8, 88275

**LDT or Modified FDA:**
- Yes

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- CYALL2

**Performing Lab:**
- Molecular Genetics - Cytogenetics

**Performed:**
- Monday - Friday 0900-1700

**Methodology:**
- FISH

**Remarks:**
- Mix blood and marrow aspirate well with anticoagulant.
  - Keep all samples at room temperature.

**Collect:**
- Blood or Bone marrow aspirate: Dark green top
- Bone marrow core: Screw top polypropylene tube with transport media

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm core

**Sample Type:**
- Heparinized whole blood or bone marrow aspirate, Bone marrow core biopsy

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm core

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm core

**Unacceptable Conditions:**
- Clotted samples. Samples received unlabeled, refrigerated or frozen.

**Specimen Preparation:**
Do not centrifuge, refrigerate or freeze samples.

Transport to China Basin Cytogenetics asap.

**Synonyms:**
- B ALL FISH Panel 2

**Stability (from collection to initiation):**
- Room temperature 2 days

**Reported:**
- 1-2 weeks

**CPT Codes:**
- 88271 x8, 88275

**LDT or Modified FDA:**
- Yes
Acute Myeloid Leukemia FISH Panel
CYAML, BCYAML

ORDERING

Available Stat:  
No
Performing Lab:  
Medical Genomics - Cytogenetics
Performed:  
Monday - Friday day shift
Methodology:  
Fluorescence in situ Hybridization (FISH)
Reported:  
1-2 weeks
Additional Information:  
Includes FISH probes for the following markers: Monsomy 5, Deletion 5q, Monosomy 7, Deletion 7q, Trisomy 8, Deletion 20q, Translocation 15:17, Inversion 16q, Translocation 8:21

The individual FISH markers are orderable separately
Synonyms:  
- AML
- M5D5Q
- M7D7Q
- TRIS8
- DEL20Q
- TR1517
- INV16Q
- TR821
- MLLQ23
- Monsomy 5
- Deletion 5q
- Monosomy 7
- Deletion 7q
- Trisomy 8
- Deletion 20q
- Translocation 15:17
- Inversion 16q
- Translocation 8:21
- CYAML
- BCYAML

COLLECTION

Sample Type:  
Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core
Collect:  
Dark green top
Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Remarks:
Transport samples at room temperature

Stability (from collection to initiation):
Room temperature 2 days

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

PROCESSING

Test Code:
BCYAML: Blood
CYAML: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Do not centrifuge, store at room temperature. Transport samples to Cytogenetics as soon as possible.

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

Stability (from collection to initiation):
Room temperature 2 days

RESULT INTERPRETATION

Additional Information:
Includes FISH probes for the following markers: Monosomy 5, Deletion 5q, Monosomy 7, Deletion 7q, Trisomy 8, Deletion 20q, Translocation 15:17, Inversion 16q, Translocation 8:21

The individual FISH markers are orderable separately

ADMINISTRATIVE

CPT Codes:
88271 x13, 88275 x8

LDT or Modified FDA:
Yes

COMPLETE VIEW
Available Stat: No

Test Code:
- BCYAML: Blood
- CYAML: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Monday - Friday day shift

Methodology:
- Fluorescence in situ Hybridization (FISH)

Remarks:
- Transport samples at room temperature

Collect:
- Dark green top

Amount to Collect:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:
- Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Frozen, cracked or mislabeled containers

Specimen Preparation:
- Do not centrifuge, store a room temperature. Transport samples to Cytogenetics as soon as possible.

Synonyms:
- AML
- M5D5Q
- M7D7Q
- TRIS8
- DEL20Q
- TR1517
- INV16Q
- TR821
- MLLQ23
- Monsomy 5
- Deletion 5q
- Monosomy 7
- Deletion 7q
- Trisomy 8
- Deletion 20q
- Translocation 15:17
- Inversion 16q
- Translocation 8:21
- CYAML
- BCYAML

**Stability (from collection to initiation):**

 Room temperature 2 days

**Reported:**

 1-2 weeks

**Additional Information:**

 Includes FISH probes for the following markers: Monosomy 5, Deletion 5q, Monosomy 7, Deletion 7q, Trisomy 8, Deletion 20q, Translocation 15:17, Inversion 16q, Translocation 8:21

 The individual FISH markers are orderable separately

**CPT Codes:**

 88271 x13, 88275 x8

**LDT or Modified FDA:**

 Yes
Acylcarnitine Profile
ACYLP

ORDERING
Available Stat: No
Performing Lab: Lucille-Packard Children's Hospital
Methodology: Stable Isotope Dilution LC-MS/MS
Reported: Testing is batched, twice weekly. Turnaround time 1 week.
Additional Information: For possible fatty acid oxidation abnormalities undetected by urinary organic acid analysis. Note that reference ranges differ for plasma vs. serum. Note that no analytic standards are yet available for hydroxylic and dicarboxylic acylcarnitines; for these analytes (marked with a *), response ratios to internal standards are given instead. Urine acylcarnitine profiles are of no predictive values and will not be run unless approved by the reference laboratory director. Elevation of C14:1- and to a lesser extent of C16:1- and C18:1-carnitine esters is characteristic of deficient activity of long-chain acyl-coenzyme A dehydrogenase.

Synonyms:
- Acyl-carnitine
- C14:1 Carnitine
- Long chain fatty acid oxidation defect

COLLECTION
Sample Type: Heparinized Plasma
Collect: Dark Green (Na-Heparin)
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma
Minimum Volume: 0.3 mL plasma

PROCESSING
Test Code: ACYLP
Sendout: Yes
Performing Lab: Lucille-Packard Children's Hospital
Specimen Preparation: Freeze plasma at -20C. Order Acylcarnitine profile. Ship on dry ice Monday-Friday only by Stanford Courier to: Stanford University Medical Center Biochemical Genetics Laboratory
Preferred Volume: 0.5 mL plasma
Minimum Volume: 0.3 mL plasma

RESULT INTERPRETATION
**Reference Interval:**
Click [here](#) for table.

**Additional Information:**
For possible fatty acid oxidation abnormalities undetected by urinary organic acid analysis. Note that reference ranges differ for plasma vs. serum. Note that no analytic standards are yet available for hydroxylic and dicarboxylic acylcarnitines; for these analytes (marked with an *), response ratios to internal standards are given instead. Urine acylcarnitine profiles are of no predictive values and will not be run unless approved by the reference laboratory director. Elevation of C14:1- and to a lesser extent of C16:1- and C18:1-carnitine esters is characteristic of deficient activity of long-chain acyl-coenzyme A dehydrogenase.

### ADMINISTRATIVE

**CPT Codes:**
- 82017-90

**LOINC Codes:**
- 43433-2

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
ACYLP

**Performing Lab:**
Lucille-Packard Children's Hospital

**Sendout:**
Yes

**Methodology:**
Stable Isotope Dilution LC-MS/MS

**Collect:**
Dark Green (Na-Heparin)

**Amount to Collect:**
1 mL blood

**Sample Type:**
Heparinized Plasma

**Preferred Volume:**
0.5 mL plasma

**Minimum Volume:**
0.3 mL plasma

**Specimen Preparation:**
Freeze plasma at -20°C. Order Acylcarnitine profile. Ship on dry ice Monday-Friday only by Stanford Courier to: Stanford University Medical Center Biochemical Genetics Laboratory

**Reference Interval:**
Click [here](#) for table.

**Synonyms:**
- Acyl-carnitine
- C14:1 Carnitine
- Long chain fatty acid oxidation defect

**Reported:**
Testing is batched, twice weekly. Turnaround time 1 week.

**Additional Information:**
For possible fatty acid oxidation abnormalities undetected by urinary organic acid analysis. Note that reference ranges differ for plasma vs. serum. Note that no analytic standards are yet available for hydroxylic and dicarboxylic acylcarnitines; for these analytes (marked with an *), response ratios to internal standards are given instead. Urine acylcarnitine profiles are of no predictive values and will not be run unless approved by the reference laboratory director. Elevation of C14:1- and to a lesser extent of C16:1- and C18:1-carnitine esters is characteristic of deficient activity of long-chain acyl-coenzyme A dehydrogenase.
CPT Codes:
82017-90

LOINC Codes:
43433-2
Acylglycine Profile
AGLY

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Stable Isotope Dilution/GCMS
Reported:
Test performed weekly. Turnaround time: 2-9 days.
Additional Information:
For possible fatty acid oxidation abnormalities due to a mutation of acylcoenzyme A dehydrogenase but undetected by urinary organic acid analysis. Elevation of hexanoyl- and phenylpropionylglycine is characteristic of deficient activity of medium-chain acylcoenzyme A dehydrogenase.
Synonyms:
• Acyl-glycine
• MCAD
• Medium chain acyl-coenzyme a dehydrogenase deficiency
• Medium chain fatty acid oxidation defect
• Hexanoylglycine
• Phenylpropionylglycine
• Suberylglycine

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
3 mL urine

PROCESSING

Test Code:
AGLY
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Freeze at -20C. Order MAYO# 81249 PT54490. Forward specimen frozen to China Basin Sendout for Mayo courier pickup Monday-Friday at 1600 hours.
Preferred Volume:
5 mL urine
Minimum Volume:
3 mL urine

RESULT INTERPRETATION

Units:
µg/mg creatinine

Reference Interval:
- 2-Ethylmalonic Acid: 0.5-20.2 µg/mg creatinine
- 2-Methylsuccinic Acid: 0.4-13.8 µg/mg creatinine
- Glutaric Acid: 0.6-15.2 µg/mg creatinine
- Isobutyrylglycine: <0.01-11.0 µg/mg creatinine
- n-Butyrylglycine: 0.1-2.1 µg/mg creatinine
- 2-Methylbutyrylglycine: 0.3-7.5 µg/mg creatinine
- Isovalerylglucose: 0.3-14.3 µg/mg creatinine
- n-Hexanoylglucose: 0.2-1.9 µg/mg creatinine
- n-Octanoylglucose: 0.1-2.1 µg/mg creatinine
- 3-Phenylpropionylglycine: <0.01-1.1 µg/mg creatinine
- Suberylglycine: <0.01-11.0 µg/mg creatinine
- trans-Cinnamoylglycine: 0.2-14.7 µg/mg creatinine
- Dodecanedioic Acid (12 DCA): 0.1-1.1 µg/mg creatinine
- Tetradodecanedioic Acid (14 DCA): <0.01-1.0 µg/mg creatinine
- Hexadodecanedioic Acid (16 DCA): <0.01-1.0 µg/mg creatinine

Additional Information:
For possible fatty acid oxidation abnormalities due to a mutation of acylcoenzyme A dehydrogenase but undetected by urinary organic acid analysis. Elevation of hexanoyl- and phenylpropionylglycine is characteristic of deficient activity of medium-chain acylcoenzyme A dehydrogenase.

ADMINISTRATIVE

CPT Codes:
- 82544-90

LOINC Codes:
- 13753-9

COMPLETE VIEW

Available Stat:
No

Test Code:
AGLY

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Stable Isotope Dilution/GCMS

Collect:
Urine cup

Amount to Collect:
20 mL urine

Sample Type:
Random urine

Preferred Volume:
5 mL urine

Minimum Volume:
3 mL urine

**Specimen Preparation:**
Freeze at -20°C. Order MAYO# 81249 PT54490. Forward specimen frozen to China Basin Sendout for Mayo courier pickup Monday-Friday at 1600 hours.

**Units:**
µg/mg creatinine

**Reference Interval:**
- 2-Ethylmalonic Acid: 0.5-20.2 µg/mg creatinine
- 2-Methylsuccinic Acid: 0.4-13.8 µg/mg creatinine
- Glutaric Acid: 0.6-15.2 µg/mg creatinine
- Isobutyrylglycine: <0.01-11.0 µg/mg creatinine
- n-Butyrylglycine: 0.1-2.1 µg/mg creatinine
- 2-Methylbutyrylglycine: 0.3-7.5 µg/mg creatinine
- Isovalerylglycine: 0.3-14.3 µg/mg creatinine
- n-Hexanoylglycine: 0.2-1.9 µg/mg creatinine
- n-Octanoylglycine: 0.1-2.1 µg/mg creatinine
- 3-Phenylpropionylglycine: <0.01-1.1 µg/mg creatinine
- Suberylglycine: <0.01-11.0 µg/mg creatinine
- trans-Cinnamoylglycine: 0.2-14.7 µg/mg creatinine
- Dodecanedioic Acid (12 DCA): 0.1-1.1 µg/mg creatinine
- Tetradodecanedioic Acid (14 DCA): <0.01-1.0 µg/mg creatinine
- Hexadodecanedioic Acid (16 DCA): <0.01-1.0 µg/mg creatinine

**Synonyms:**
- Acyl-glycine
- MCAD
- Medium chain acyl-coenzyme a dehydrogenase deficiency
- Medium chain fatty acid oxidation defect
- Hexanoylglycine
- Phenylpropionylglycine
- Suberylglycine

**Reported:**
Test performed weekly. Turnaround time: 2-9 days.

**Additional Information:**
For possible fatty acid oxidation abnormalities due to a mutation of acylcoenzyme A dehydrogenase but undetected by urinary organic acid analysis. Elevation of hexanoyl- and phenylpropionylglycine is characteristic of deficient activity of medium-chain acylcoenzyme A dehydrogenase.

**CPT Codes:**
82544-90

**LOINC Codes:**
13753-9
Adalimumab Activity and Neutralizing Antibody
ADAN

ORDERING

Ordering Recommendations:
Evaluate response failure to adalimumab therapy. Determine and adjust dosage or identify the need for change to another anti-TNF-alpha inhibitor.
Performing Lab:
ARUP
Performed:
Mon, Wed, Thu, Sat
Methodology:
Cell Culture/Quantitative Chemiluminescent Immunoassay/ Semi-Quantitative Chemiluminescent Immunoassay
Reported:
2-3 days
Synonyms:
• Humira

COLLECTION

Patient Preparation:
Collect specimens before adalimumab treatment.
Collect:
Serum separator tube.
Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Refrigerated.
Unacceptable Conditions:
Contaminated, hemolyzed, icteric, or lipemic specimens.

PROCESSING

Test Code:
ADAN
ARUP Test Code:
2011248
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.3 mL)
Unacceptable Conditions:
Contaminated, hemolyzed, icteric, or lipemic specimens.
Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION
**Reference Interval:**

<table>
<thead>
<tr>
<th>Available Separately</th>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Adalimumab Activity</td>
<td>Not Detected</td>
</tr>
<tr>
<td>No</td>
<td>Adalimumab Neutralizing Antibody</td>
<td>Not Detected</td>
</tr>
</tbody>
</table>

**Interpretive Data:**

This test measures the capacity of adalimumab to neutralize TNF-alpha activity. Additionally, adalimumab neutralizing antibodies (NAb) are titered (reporting the minimal serum dilution at which blocking of adalimumab activity is no longer observed).

This test is used to evaluate secondary response failures to adalimumab therapy. Secondary response failure is defined as loss of clinical response after initial improvement of clinical signs and symptoms. Therapeutic decision should rest on both the clinical response and the knowledge of the fate of the drug including the emergence of immunogenicity in individual patients.

Circulating adalimumab levels have been shown to vary considerably between patients. These differences relate to route and frequency of administration and patient-related features such as age, gender, weight, drug metabolism, and concomitant medications such as methotrexate and other immunosuppressants.

<table>
<thead>
<tr>
<th>IF Adalimumab Activity is...</th>
<th>AND Adalimumab Neutralizing Ab. Titer is...</th>
<th>THEN....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Detected</td>
<td>Not Detected</td>
<td>A higher dosage of adalimumab or shortening the dosing interval may be appropriate.</td>
</tr>
<tr>
<td>Not Detected</td>
<td>1:20 or greater</td>
<td>A change to another anti-TNF- drug may be appropriate.</td>
</tr>
<tr>
<td>0.65 ug/mL or greater</td>
<td>Not Detected</td>
<td>A change to another type of therapy (not targeting TNF-) may be appropriate.</td>
</tr>
<tr>
<td>0.65 ug/mL or greater</td>
<td>1:20 or greater</td>
<td>Repeat testing is suggested to rule out decreasing adalimumab activity and/or increasing adalimumab neutralizing antibodies.</td>
</tr>
</tbody>
</table>

**ADMINISTRATIVE**

**CPT Codes:**

80299; 82397

**COMPLETE VIEW**

**Ordering Recommendations:**

Evaluate response failure to adalimumab therapy. Determine and adjust dosage or identify the need for change to another anti-TNF-alpha inhibitor.

**Test Code:**

ADAN

**ARUP Test Code:**

2011248

**Performing Lab:**

ARUP

**Sendout:**

Yes

**Performed:**

Mon, Wed, Thu, Sat

**Methodology:**

Cell Culture/Quantitative Chemiluminescent Immunoassay/ Semi-Quantitative Chemiluminescent Immunoassay

**Patient Preparation:**

Collect specimens before adalimumab treatment.

**Collect:**

Serum separator tube.

**Unacceptable Conditions:**

Contaminated, hemolyzed, icteric, or lipemic specimens.

**Specimen Preparation:**

Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.3
Reference Interval:

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<th>Components</th>
<th>Reference Interval</th>
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<td>No</td>
<td>Adalimumab Neutralizing Antibody</td>
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</table>

Interpretive Data:

This test measures the capacity of adalimumab to neutralize TNF-alpha activity. Additionally, adalimumab neutralizing antibodies (NAb) are titered (reporting the minimal serum dilution at which blocking of adalimumab activity is no longer observed).

This test is used to evaluate secondary response failures to adalimumab therapy. Secondary response failure is defined as loss of clinical response after initial improvement of clinical signs and symptoms. Therapeutic decision should rest on both the clinical response and the knowledge of the fate of the drug including the emergence of immunogenicity in individual patients.

Circulating adalimumab levels have been shown to vary considerably between patients. These differences relate to route and frequency of administration and patient-related features such as age, gender, weight, drug metabolism, and concomitant medications such as methotrexate and other immunosuppressants.

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<th>THEN....</th>
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<tr>
<td>Not Detected</td>
<td>1:20 or greater</td>
<td>A change to another anti-TNF- drug may be appropriate.</td>
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<tr>
<td>0.65 ug/mL or greater</td>
<td>Not Detected</td>
<td>A change to another type of therapy (not targeting TNF-) may be appropriate.</td>
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<tr>
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<td>1:20 or greater</td>
<td>Repeat testing is suggested to rule out decreasing adalimumab activity and/or increasing adalimumab neutralizing antibodies.</td>
</tr>
</tbody>
</table>

Synonyms:
- Humira

Storage/Transport Temperature:
- Refrigerated.

Stability (from collection to initiation):
- After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
- 2-3 days

CPT Codes:
- 80299; 82397

Notes:
- This test is performed pursuant to an agreement with Euro Diagnostica.
ADAMTS13 ACTIVITY
ADA13

ORDERING

| Available Stat: | No |
| Performing Lab: | Machaon Diagnostics |
| Methodology: | ELISA |

Reported:
- 1 - 2 days

Additional Information:
- A severe decrease in ADAMTS-13 activity to less than 10% has been shown to be diagnostic for Thrombotic Thrombocytopenic Purpura (TTP), an illness characterized by thrombocytopenia, microangiopathic hemolytic anemia (MAHA), fever, renal dysfunction and central nervous system ischemia. TTP is often difficult to diagnose as well as differentiate from other thrombotic microangiopathies (TMA) such as hemolytic uremic syndrome (HUS) and atypical hemolytic uremic syndrome (aHUS).

- TTP is characterized by the acquired or congenital deficiency of ADAMTS-13 activity. An antibody inhibitor will be present in roughly half of the cases diagnosed with idiopathic TTP.

- Early diagnosis is paramount. Left untreated, TTP has a mortality rate above 90%; however, rapid diagnosis and treatment with plasma exchange improve the mortality rate to below 20%.

- To maximize the clinical utility of this test, Machaon Diagnostics is offering ADAMTS-13 activity and inhibitor testing on a daily basis with clinical consultation.

- Inhibitor assay is performed as a reflex if levels are low.

- Absent or low levels of ADAMTS13 activity may allow the accumulation of ultra-large von Willebrand factor multimers (ULVWF) in plasma. It is hypothesized that these ULVWF cause the intravascular platelet aggregation characteristic of TTP.

- Activity levels below 10% are seen in acute and relapsing idiopathic (autoimmune) thrombotic thrombocytopenic purpura (TTP) but also in a rare hereditary gene mutation of VWF protein at the cleavage site. Activity levels between 10 and 30% may be seen in some instances, including when immunosuppressive therapy or recent plasmapheresis exchange has been started. Mild decreases in ADAMTS-13 activity are seen in a wide variety of conditions including metastatic cancer, neonates, serious infections and cirrhosis of the liver.

Reflex Testing:
- Yes, If the test for Protease Inhibitor is required, it will be ordered and billed at an additional charge.

Synonyms:
- von Willebrand Factor Cleaving Protease
- Thrombotic thrombocytopenic purpura
- TTP

COLLECTION

| Sample Type: | Citrated platelet poor plasma |
| Collect: | Blue top filled to full extent of vacuum |
| Amount to Collect: | 2.7 mL blood |
| Preferred Volume: | 1 mL plasma |
| Minimum Volume: | 1 mL plasma |
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to
wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then
draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Stability (from collection to initiation):
Room temperature 7 days

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Marked hemolysis or
hyperbilirubinemia

Rejection Criteria:
Marked hemolysis or hyperbilirubinemia

PROCESSING

Test Code:
ADA13

Test Group:
von Willebrand

Sendout:
Yes

Performing Lab:
Machaon Diagnostics

Specimen Preparation:
Aliquot plasma and maintain at ambient. Call Machaon courier at (510) 839-5600. After hours and weekend samples will be handled by
Hematology.

Preferred Volume:
1 mL plasma

Minimum Volume:
1 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Marked hemolysis or
hyperbilirubinemia

Rejection Criteria:
Marked hemolysis or hyperbilirubinemia

Stability (from collection to initiation):
Room temperature 7 days

RESULT INTERPRETATION

Units:
Activity %

Reference Interval:
40-130%

Critical Values:
Machaon: < 10%

Additional Information:
A severe decrease in ADAMTS-13 activity to less than 10% has been shown to be diagnostic for Thrombotic Thrombocytopenic Purpura
(TTP), an illness characterized by thrombocytopenia, microangiopathic hemolytic anemia (MAHA), fever, renal dysfunction and central
nervous system ischemia. TTP is often difficult to diagnose as well as differentiate from other thrombotic microangiopathies (TMA) such
as hemolytic uremic syndrome (HUS) and atypical hemolytic uremic syndrome (aHUS).

TTP is characterized by the acquired or congenital deficiency of ADAMTS-13 activity. An antibody inhibitor will be present in roughly half
of the cases diagnosed with idiopathic TTP.
Early diagnosis is paramount. Left untreated, TTP has a mortality rate above 90%; however, rapid diagnosis and treatment with plasma exchange improve the mortality rate to below 20%.

To maximize the clinical utility of this test, Machaon Diagnostics is offering ADAMTS-13 activity and inhibitor testing on a daily basis with clinical consultation.

Inhibitor assay is performed as a reflex if levels are low.

Absent or low levels of ADAMTS13 activity may allow the accumulation of ultra-large von Willebrand factor multimers (ULVWF) in plasma. It is hypothesized that these ULVWF cause the intravascular platelet aggregation characteristic of TTP.

Activity levels below 10% are seen in acute and relapsing idiopathic (autoimmune) thrombotic thrombocytopenic purpura (TTP) but also in a rare hereditary gene mutation of VWF protein at the cleavage site. Activity levels between 10 and 30% may be seen in some instances, including when immunosuppressive therapy or recent plasmapheresis exchange has been started. Mild decreases in ADAMTS-13 activity are seen in a wide variety of conditions including metastatic cancer, neonates, serious infections and cirrhosis of the liver.

**ADMINISTRATIVE**

CPT Codes:
- 85247-90 (activity), 85335-90 (inhibitor)

LOINC Codes:
- 34589-2

**COMPLETE VIEW**

Available Stat: No

Test Code: ADA13

Test Group: von Willebrand

Performing Lab: Machaon Diagnostics

Sendout: Yes

Methodology: ELISA

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Collect: Blue top filled to full extent of vacuum

Amount to Collect: 2.7 mL blood

Sample Type: Citrated platelet poor plasma

Preferred Volume: 1 mL plasma

Minimum Volume: 1 mL plasma

Rejection Criteria: Marked hemolysis or hyperbilirubinemia

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Marked hemolysis or hyperbilirubinemia

**Specimen Preparation:**
Aliquot plasma and maintain at ambient. Call Machaon courier at (510) 839-5600. After hours and weekend samples will be handled by Hematology.

**Units:**
Activity %

**Reference Interval:**
40-130%

**Critical Values:**
Machaon: < 10%

**Synonyms:**
- von Willebrand Factor Cleaving Protease
- Thrombotic thrombocytopenic purpura
- TTP

**Stability (from collection to initiation):**
Room temperature 7 days

**Reported:**
1 - 2 days

**Reflex Testing:**
Yes, if the test for Protease Inhibitor is required, it will be ordered and billed at an additional charge.

**Additional Information:**
A severe decrease in ADAMTS-13 activity to less than 10% has been shown to be diagnostic for Thrombotic Thrombocytopenic Purpura (TTP), an illness characterized by thrombocytopenia, microangiopathic hemolytic anemia (MAHA), fever, renal dysfunction and central nervous system ischemia. TTP is often difficult to diagnose as well as differentiate from other thrombotic microangiopathies (TMA) such as hemolytic uremic syndrome (HUS) and atypical hemolytic uremic syndrome (aHUS).

TTP is characterized by the acquired or congenital deficiency of ADAMTS-13 activity. An antibody inhibitor will be present in roughly half of the cases diagnosed with idiopathic TTP.

Early diagnosis is paramount. Left untreated, TTP has a mortality rate above 90%; however, rapid diagnosis and treatment with plasma exchange improve the mortality rate to below 20%.

To maximize the clinical utility of this test, Machaon Diagnostics is offering ADAMTS-13 activity and inhibitor testing on a daily basis with clinical consultation.

Inhibitor assay is performed as a reflex if levels are low.

Absent or low levels of ADAMTS-13 activity may allow the accumulation of ultra-large von Willebrand factor multimers (ULVWF) in plasma. It is hypothesized that these ULVWF cause the intravascular platelet aggregation characteristic of TTP.

Activity levels below 10% are seen in acute and relapsing idiopathic (autoimmune) thrombotic thrombocytopenic purpura (TTP) but also in a rare hereditary gene mutation of VWF protein at the cleavage site. Activity levels between 10 and 30% may be seen in some instances, including when immunosuppressive therapy or recent plasmapheresis exchange has been started. Mild decreases in ADAMTS-13 activity are seen in a wide variety of conditions including metastatic cancer, neonates, serious infections and cirrhosis of the liver.

**CPT Codes:**
85247-90 (activity), 85335-90 (inhibitor)

**LOINC Codes:**
34589-2
Adenosine Deaminase, CSF
ADAC

ORDERING

Ordering Recommendations:
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

Available Stat:
No
Performing Lab:
Quest
Methodology:
Kinetic Spectrophotometric
Reported:
3 - 5 days

Additional Information:
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

Synonyms:
- Tuberculosis

COLLECTION

Sample Type:
CSF
Collect:
Sterile screw top container
Amount to Collect:
3 mL
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 3 days, frozen 6 months

PROCESSING

Test Code:
ADAC
Test Group:
Adenosine deaminase
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Preferred Volume:**
- 3 mL

**Minimum Volume:**
- 1 mL

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

### RESULT INTERPRETATION

**Units:**
- ng/mL

**Additional Information:**
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

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### ADMINISTRATIVE

**CPT Codes:**
- 84311-90

### COMPLETE VIEW

**Available Stat:**
- No

**Ordering Recommendations:**
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

**Test Code:**
- ADAC

**Test Group:**
- Adenosine deaminase

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Kinetic Spectrophotometric

**Collect:**
- Sterile screw top container

**Amount to Collect:**
- 3 mL

**Sample Type:**
- CSF

**Preferred Volume:**
- 3 mL

**Minimum Volume:**
- 1 mL

**Specimen Preparation:**
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Units:**
- ng/mL

**Synonyms:**
- Tuberculosis

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

**Reported:**
- 3 - 5 days

**Additional Information:**

Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

**CPT Codes:**
- 84311-90
Adenosine Deaminase, Peritoneal fluid
ADAPT

ORDERING

Ordering Recommendations:
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

Available Stat: No
Performing Lab: Quest
Methodology: Kinetic Spectrophotometric
Reported: 3 - 5 days

Additional Information:
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

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Synonyms:
- Tuberculosis

COLLECTION

Sample Type: Peritoneal fluid
Collect: Sterile screw top container
Amount to Collect: 10 mL
Preferred Volume: 10 mL
Minimum Volume: 5 mL
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 3 days, frozen 6 months

PROCESSING

Test Code: ADAPT
Test Group: Adenosine deaminase
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: 

Test information subject to change
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Preferred Volume:**
- 10 mL

**Minimum Volume:**
- 5 mL

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

**RESULT INTERPRETATION**

**Units:**
- ng/mL

**Additional Information:**
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

**ADMINISTRATIVE**

**CPT Codes:**
- 84311-90

**COMPLETE VIEW**

**Available Stat:**
- No

**Ordering Recommendations:**
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

**Test Code:**
- ADAPT

**Test Group:**
- Adenosine deaminase

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Kinetic Spectrophotometric

**Collect:**
- Sterile screw top container

**Amount to Collect:**
- 10 mL

**Sample Type:**
- Peritoneal fluid

**Preferred Volume:**
- 10 mL

**Minimum Volume:**
- 5 mL

**Specimen Preparation:**
- Print 06/07/19

Test information subject to change
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Units:**
- ng/mL

**Synonyms:**
- Tuberculosis

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

**Reported:**
- 3 - 5 days

**Additional Information:**
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

**CPT Codes:**
- 84311-90
Adenosine Deaminase, Pleural fluid
ADAPL

ORDERING

Ordering Recommendations:
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

Available Stat:
No
Performing Lab:
Quest
Methodology:
Kinetic Spectrophotometric
Reported:
3 - 5 days
Additional Information:
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

Synonyms:
- Tuberculosis

COLLECTION

Sample Type:
Pleural fluid
Collect:
Sterile screw top container
Amount to Collect:
10 mL
Preferred Volume:
10 mL
Minimum Volume:
5 mL
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 3 days, frozen 6 months

PROCESSING

Test Code:
ADAPL
Test Group:
Adenosine deaminase
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Preferred Volume:**
- 10 mL

**Minimum Volume:**
- 5 mL

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

---

**RESULT INTERPRETATION**

**Units:**
- ng/mL

**Additional Information:**
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

---

**ADMINISTRATIVE**

**CPT Codes:**
- 84311-90

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**COMPLETE VIEW**

**Available Stat:**
- No

**Ordering Recommendations:**
Given the relatively low prevalence of tuberculosis ADA should be ordered only in patients with a moderate to high index of suspicion for tuberculosis (Positive personal, family or TB exposure history, positive PPD, etc.) with an exudative effusion containing high numbers of lymphocytes that is negative for mycobacteria by direct examination and culture.

**Test Code:**
- ADAPL

**Test Group:**
- Adenosine deaminase

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Kinetic Spectrophotometric

**Collect:**
- Sterile screw top container

**Amount to Collect:**
- 10 mL

**Sample Type:**
- Pleural fluid

**Preferred Volume:**
- 10 mL

**Minimum Volume:**
- 5 mL

**Specimen Preparation:**
Freeze specimen and transport to CB frozen. Order Quest code 17697.

**Units:**
- ng/mL

**Synonyms:**
- Tuberculosis

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 3 days, frozen 6 months

**Reported:**
- 3 - 5 days

**Additional Information:**
Although Adenosine deaminase (ADA) is suggested as a surrogate marker for Tuberculosis, it is not specific for that disease. Elevated levels of ADA may also be seen in other forms of granulomatous inflammation as well as liver cirrhosis, liver fibrosis, certain malignancies (e.g. lymphoma), viral hepatitis, and autoimmune diseases (e.g. SLE, rheumatoid arthritis).

The sensitivity and specificity of ADA for tuberculosis are generally listed as 78-100% and 85-97% respectively. Using 95% for both sensitivity and specificity and a prevalence of tuberculosis in San Francisco of 15/100,000 (0.015%) the test has a negative predictive value of 100% but a positive predictive value of only 0.28%. Therefore the ADA is a poor test to diagnose tuberculosis although it may be useful in ruling it out.

**CPT Codes:**
- 84311-90
Adenovirus Antibody

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Complement fixation
Reported:
Performed 5x per week. Turnaround 3-5 days

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Interpretation requires comparison between acute and convalescent antibody titers.
Label samples as ‘Acute’ or ‘Convalescent’. Convalescent samples should be collected 2-3 weeks after the acute sample.
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.

PROCESSING

Test Code:
ADEN
Test Group:
Adenovirus
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum at -20C. Ship frozen to China basin sendouts. Order Quest test # 50419P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
**Test Information**

- **Test Code:** ADEN
- **Test Group:** Adenovirus
- **Performing Lab:** Quest
- **Sendout:** Yes
- **Methodology:** Complement fixation
- **Remarks:**
  Interpretation requires comparison between acute and convalescent antibody titers.
  Label samples as 'Acute' or 'Convalescent'. Convalescent samples should be collected 2-3 weeks after the acute sample.

**Collect:**
- Red top or Gold top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Specimen Preparation:**
- Freeze serum at -20C. Ship frozen to China basin sendouts. Order Quest test # 50419P

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.

**Reported:**
- Performed 5x per week. Turnaround 3-5 days

**CPT Codes:**
- 86603-90

**LOINC Codes:**
- 5041-9
Adenovirus Antigen Detection, Gastroenteritis, EIA
AADG

ORDERING

Performing Lab:
Quest
Methodology:
EIA
Reported:
3-5 days
Additional Information:
Adenovirus causes respiratory tract infections, conjunctivitis, and diarrhea. Infections are most common in individuals who are immunocompromised and in young children. Adenovirus Antigen Detection is useful to confirm the diagnosis of adenovirus infection in patients with gastroenteritis.

COLLECTION

Sample Type:
Stool
Collect:
Stool collection container
Amount to Collect:
5 mL / 5 g
Preferred Volume:
5 mL / 5g
Minimum Volume:
1 mL / 1 g
Remarks:
5 mL or 5 g stool or swab with visible stool (1 mL stool or 1 g minimum, pea-sized portion of stool). Collect fresh stool in sterile, leak-proof container without media, perservative or metal ion. For patients requiring the use of diapers, first line the diaper with clean plastic to prevent absorption. Then transfer 5 g or 5 mL of stool specimen from the plastic lined diaper to the sterile container. Do not submit the diaper itself. Cap securely. Do not use M4 transport media. Do not use any preservative, media or additive.

Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: 72 hours
Frozen: 30 days
Rejection Criteria:
Specimens other than stool • Insufficient material on swab • Received in preservative • Transport media • Diapers

PROCESSING

Test Code:
AADG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do not aliquot. Freeze sample and transport to CB frozen. Order Quest test code 38945.
Preferred Volume:
5 mL / 5g
Minimum Volume:
1 mL / 1 g
Rejection Criteria:
Specimens other than stool • Insufficient material on swab • Received in preservative • Transport media • Diapers

Stability (from collection to initiation):
- Room temperature: Unacceptable
- Refrigerated: 72 hours
- Frozen: 30 days

RESULT INTERPRETATION

Additional Information:
Adenovirus causes respiratory tract infections, conjunctivitis, and diarrhea. Infections are most common in individuals who are immunocompromised and in young children. Adenovirus Antigen Detection is useful to confirm the diagnosis of adenovirus infection in patients with gastroenteritis.

ADMINISTRATIVE

CPT Codes:
87301-90

LOINC Codes:
5825-5

COMPLETE VIEW

Test Code:
AADG

Performing Lab:
Quest

Sendout:
Yes

Methodology:
EIA

Remarks:
5 mL or 5 g stool or swab with visible stool (1 mL stool or 1 g minimum, pea-sized portion of stool). Collect fresh stool in sterile, leak-proof container without media, perservative or metal ion. For patients requiring the use of diapers, first line the diaper with clean plastic to prevent absorption. Then transfer 5 g or 5 mL of stool specimen from the plastic lined diaper to the sterile container. Do not submit the diaper itself. Cap securely. Do not use M4 transport media. Do not use any preservative, media or additive.

Collect:
Stool collection container

Amount to Collect:
5 mL / 5 g

Sample Type:
Stool

Preferred Volume:
5 mL / 5g

Minimum Volume:
1 mL / 1 g

Rejection Criteria:
Specimens other than stool • Insufficient material on swab • Received in preservative • Transport media • Diapers

Specimen Preparation:
Do not aliquot. Freeze sample and transport to CB frozen. Order Quest test code 38945.

Stability (from collection to initiation):
- Room temperature: Unacceptable
- Refrigerated: 72 hours
- Frozen: 30 days

Reported:
3-5 days

Additional Information:
Adenovirus causes respiratory tract infections, conjunctivitis, and diarrhea. Infections are most common in individuals who are immunocompromised and in young children. Adenovirus Antigen Detection is useful to confirm the diagnosis of adenovirus infection in patients with gastroenteritis.

**CPT Codes:**
87301-90

**LOINC Codes:**
5825-5
Adenovirus DNA, Non-plasma samples
ADVP

ORDERING

Ordering Recommendations:
Testing on urine samples would only be indicated in a pediatric or transplant patient with hemorrhagic cystitis.

Approval Required:
No, except for urine samples, call Microbiology at 415-353-1268

Available Stat:
No

Performing Lab:
Viracor

Methodology:
Real-time PCR

Synonyms:
Adenovirus PCR

COLLECTION

Sample Type:
Bone marrow, Unfixed tissue, CSF, BAL, urine (requires approval)

Collect:
Bone marrow: Lavender top
Other samples: Urine cup, CSF tube or sterile collection tube

Preferred Volume:
Tissue: 5 mg (1/2 pencil eraser size)
Fluids: 2 mL

Minimum Volume:
Tissue: 5 mg (1/2 pencil eraser size)
Marrow: 0.2 mL
Fluids: 0.5 mL

Remarks:
Do not add water, saline, or other fluid media to container with tissue.

Unacceptable Conditions:
Improperly submitted samples, formalin fixed, paraffin embedded tissue

Rejection Criteria:
Improperly submitted samples, formalin fixed, paraffin embedded tissue

PROCESSING

Test Code:
ADVP

Test Group:
Adenovirus

Sendout:
Yes

Performing Lab:
Viracor

Specimen Preparation:
CSF and tissue must be transported frozen to China Basin and then shipped on dry ice to ViraCor.

Keep samples other than CSF and tissue at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection.

Preferred Volume:
Tissue: 5 mg (1/2 pencil eraser size)
Fluids: 2 mL

**Minimum Volume:**
- Tissue: 5 mg (1/2 pencil eraser size)
- Marrow: 0.2 mL
- Fluids: 0.5 mL

**Unacceptable Conditions:**
- Improperly submitted samples, formalin fixed, paraffin embedded tissue

**Rejection Criteria:**
- Improperly submitted samples, formalin fixed, paraffin embedded tissue

---

**RESULT INTERPRETATION**

**Units:**
- copies/mL

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**ADMINISTRATIVE**

**CPT Codes:**
- 87799-90

**LOINC Codes:**
- 49340-3

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**COMPLETE VIEW**

**Approval Required:**
- No, except for urine samples, call Microbiology at 415-353-1268

**Available Stat:**
- No

**Ordering Recommendations:**
- Testing on urine samples would only be indicated in a pediatric or transplant patient with hemorrhagic cystitis.

**Test Code:**
- ADVP

**Test Group:**
- Adenovirus

**Performing Lab:**
- Viracor

**Sendout:**
- Yes

**Methodology:**
- Real-time PCR

**Remarks:**
- Do not add water, saline, or other fluid media to container with tissue.

**Collect:**
- Bone marrow: Lavender top
- Other samples: Urine cup, CSF tube or sterile collection tube

**Sample Type:**
- Bone marrow, Unfixed tissue, CSF, BAL, urine (requires approval)

**Preferred Volume:**
- Tissue: 5 mg (1/2 pencil eraser size)
- Fluids: 2 mL

**Minimum Volume:**
- Tissue: 5 mg (1/2 pencil eraser size)
- Marrow: 0.2 mL
- Fluids: 0.5 mL

**Rejection Criteria:**
Improperly submitted samples, formalin fixed, paraffin embedded tissue

**Unacceptable Conditions:**
- Improperly submitted samples, formalin fixed, paraffin embedded tissue

**Specimen Preparation:**
- CSF and tissue must be transported frozen to China Basin and then shipped on dry ice to ViraCor.

- Keep samples other than CSF and tissue at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection.

**Units:**
- copies/mL

**Synonyms:**
- Adenovirus PCR

**CPT Codes:**
- 87799-90

**LOINC Codes:**
- 49340-3
Adenovirus DNA, Plasma
ADED

ORDERING

Performing Lab:
Microbiology
Perform:
2x per week on day shift
Methodology:
Real Time PCR
Reported:
1-5 days
Additional Information:
Monitoring of plasma Adenovirus DNA titers is useful for evaluation of disseminated infection in highly immunocompromised patients.

COLLECTION

Sample Type:
EDTA Plasma
Collect:
Lavendar top 6 mL
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL EDTA Plasma
Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma
Stability (from collection to initiation):
Room temperature 6 hours. frozen at -70C 1 month.
Unacceptable Conditions:
Heparinized or grossly hemolyzed sample.
Repeat sample from patient within 5 days unless patient has prior positive in which case 2 samples may be sent in one week.

PROCESSING

Test Code:
ADED
Performing Lab:
Microbiology
Specimen Preparation:
Separate plasma from cells within 6 hour of collection and freeze at -70C. Transport to China Basin frozen.
Preferred Volume:
3 mL EDTA Plasma
Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma
Unacceptable Conditions:
Heparinized or grossly hemolyzed sample.
Repeat sample from patient within 5 days unless patient has prior positive in which case 2 samples may be sent in one week.
Stability (from collection to initiation):
Room temperature 6 hours. frozen at -70C 1 month.
RESULT INTERPRETATION

Additional Information:
Monitoring of plasma Adenovirus DNA titers is useful for evaluation of disseminated infection in highly immunocompromised patients.

ADMINISTRATIVE

CPT Codes:
87799
LDT or Modified FDA:
Yes
LOINC Codes:
49334-6

COMPLETE VIEW

Test Code:
ADED
Performing Lab:
Microbiology
Performed:
2x per week on day shift
Methodology:
Real Time PCR
Collect:
Lavendar top 6 mL
Amount to Collect:
6 mL blood
Sample Type:
EDTA Plasma
Preferred Volume:
3 mL EDTA Plasma
Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma
Unacceptable Conditions:
Heparinized or grossly hemolyzed sample.
Repeat sample from patient within 5 days unless patient has prior positive in which case 2 samples may be sent in one week.
Specimen Preparation:
Separate plasma from cells within 6 hour of collection and freeze at -70C. Transport to China Basin frozen.
Stability (from collection to initiation):
Room temperature 6 hours, frozen at -70C 1 month.
Reported:
1-5 days
Additional Information:
Monitoring of plasma Adenovirus DNA titers is useful for evaluation of disseminated infection in highly immunocompromised patients.
CPT Codes:
87799
LDT or Modified FDA:
Yes
LOINC Codes:
49334-6
Adrenocorticotropic hormone
ACTH

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Wednesday (day shift)
Methodology:
Chemiluminescent immunometric (Siemens Immulite 2000)
Reported:
1-8 days.
Additional Information:
The ACTH precursor POMC has 2% cross reactivity in this Immulite immunochemiluminometric assay (based on in house studies using purified POMC). This level of cross reactivity can be clinically significant because patients with non-carcinoid ectopic ACTH syndromes can have very high circulating concentrations of POMC-like ACTH precursors (139 - 18,000 pmol/L) - high enough to elevate ACTH in this assay by anywhere between 3 - 360 pmol/L (~13 - 1636 ng/L).

Patients with macroadenomas have been reported to have circulating concentrations of ACTH precursors that would be high enough to elevate ACTH in our assay by anywhere between 2 - 75 pmol/L (12 - 340 ng/L)


Synonyms:
• ACTH
• Corticotropin

COLLECTION

Sample Type:
EDTA plasma
Collect:
Lavender top (on ice)
Amount to Collect:
3 mL blood
Preferred Volume:
1.5 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
Draw specimen between 0700 and 1000 hours if possible. If drawn at other times reference ranges do not apply.
Sample must be collected in pre-chilled vacutainer and delivered immediately to laboratory on ice.

Stability (from collection to initiation):
Room temp or refrigerated 4 hours, frozen at -20C 1 year.

Unacceptable Conditions:
Not delivered on ice

PROCESSING

Test Code:
ACTH
Performing Lab:
Specimen Preparation:
Process immediately. Avoid all contact with glass during processing and separation. Separate and freeze plasma in plastic tube at -20C.

Preferred Volume:
1.5 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Not delivered on ice

Stability (from collection to initiation):
Room temp or refrigerated 4 hours, frozen at -20C 1 year.

RESULT INTERPRETATION

Units:
ng/L

Reference Interval:
<3 years: Not established
3-17 years: 9-57 ng/L
>=18 years: 6-50 ng/L

Reference ranges adopted from Quest Diagnostics as determined in adult and pediatric groups using the same methodology (Siemens Immulite 2000 chemiluminescent assay). The Quest adult reference range was verified by in-house testing of 10 male and 23 female lab volunteers.

Owing to circadian variation in ACTH levels, the reference ranges are only applicable to samples collected between 0700 and 1000 hours.

Additional Information:
The ACTH precursor POMC has 2% cross reactivity in this Immulite immunochemiluminometric assay (based on in house studies using purified POMC). This level of cross reactivity can be clinically significant because patients with non-carcinoid ectopic ACTH syndromes can have very high circulating concentrations of POMC-like ACTH precursors (139 - 18,000 pmol/L) - high enough to elevate ACTH in this assay by anywhere between 3 - 360 pmol/L (~13 - 1636 ng/L).

Patients with macroadenomas have been reported to have circulating concentrations of ACTH precursors that would be high enough to elevate ACTH in our assay by anywhere between 2 - 75 pmol/L (12 - 340 ng/L)


ADMINISTRATIVE

CPT Codes:
82024

LOINC Codes:
2141-0

COMPLETE VIEW

Available Stat:
No

Test Code:
ACTH

Performing Lab:
China Basin Chemistry

Performed:
Wednesday (day shift)

Methodology:
Chemiluminescentimmunometric (Siemens Immulite 2000)
Remarks:

Draw specimen between 0700 and 1000 hours if possible. If drawn at other times reference ranges do not apply.

Sample must be collected in pre-chilled vacutainer and delivered immediately to laboratory on ice.

Collect:

Lavender top (on ice)

Amount to Collect:

3 mL blood

Sample Type:

EDTA plasma

Preferred Volume:

1.5 mL plasma

Minimum Volume:

0.5 mL plasma

Unacceptable Conditions:

Not delivered on ice

Specimen Preparation:

Process immediately. Avoid all contact with glass during processing and separation. Separate and freeze plasma in plastic tube at -20C.

Units:

ng/L

Reference Interval:

<3 years: Not established
3-17 years: 9-57 ng/L
>=18 years: 6-50 ng/L

Reference ranges adopted from Quest Diagnostics as determined in adult and pediatric groups using the same methodology (Siemens Immulite 2000 chemiluminescent assay). The Quest adult reference range was verified by in-house testing of 10 male and 23 female lab volunteers.

Owing to circadian variation in ACTH levels, the reference ranges are only applicable to samples collected between 0700 and 1000 hours.

Synonyms:

• ACTH
• Corticotropin

Stability (from collection to initiation):

Room temp or refrigerated 4 hours, frozen at -20C 1 year.

Reported:

1-8 days.

Additional Information:

The ACTH precursor POMC has 2% cross reactivity in this Immulite immunochemiluminometric assay (based on in house studies using purified POMC). This level of cross reactivity can be clinically significant because patients with non-carcinoid ectopic ACTH syndromes can have very high circulating concentrations of POMC-like ACTH precursors (139 - 18,000 pmol/L) - high enough to elevate ACTH in this assay by anywhere between 3 - 360 pmol/L (~13 - 1636 ng/L).

Patients with macroadenomas have been reported to have circulating concentrations of ACTH precursors that would be high enough to elevate ACTH in our assay by anywhere between 2 - 75 pmol/L (12 - 340 ng/L)


CPT Codes:

82024

LOINC Codes:

2141-0
AFB Blood Culture

P288

ORDERING

Approval Required:
Approval required if submitted for culture of mycobacteria other than Mycobacterium avium intracellulare complex. Call Microbiology at 353-1268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Daily

Methodology:
Culture

Reported:
Up to 60 days

Additional Information:
Blood cultures are performed only for patients with a diagnosis of AIDS and are suitable only for detecting MAIC.

Reflex Testing:
If positive additional test(s) will be performed for identification of the mycobacteria and billed separately.

Synonyms:
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacteriaum avium intercellulare complex
- MAI

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Dark green top (DO NOT use Lithium heparin i.e. Light Green top tubes)

Amount to Collect:
5 mL blood

Preferred Volume:
5 mL blood

Minimum Volume:
1 mL blood

Remarks:
Use only dark green top, sodium heparin tubes for blood samples.

Stability (from collection to initiation):
Room temperature or refrigerated 3 days

Unacceptable Conditions:
Improper container type

PROCESSING
Test Code: P288
Test Group: Mycobacteria
Performing Lab: Microbiology

Specimen Preparation:
Send sodium heparin tubes to China Basin. At China Basin, process upon receipt. Inoculate 3-5 mL into AFB culture bottle. Refer to BD BACTEC FX40 procedure.

Preferred Volume:
5 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Improper container type

Stability (from collection to initiation):
Room temperature or refrigerated 3 days

RESULT INTERPRETATION

Reference Interval:
No AFB isolated

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB culture; Repeat call only for positive sample from different site or > 2 months since initial call.

Additional Information:
Blood cultures are performed only for patients with a diagnosis of AIDS and are suitable only for detecting MAIC.

ADMINISTRATIVE

CPT Codes:
87116-90

LOINC Codes:
50941-4

COMPLETE VIEW

Approval Required:
Approval required if submitted for culture of mycobacteria other than Mycobacterium avium intracellulare complex. Call Microbiology at 353-1268

Available Stat:
No

Test Code:
P288

Test Group:
Mycobacteria

Performing Lab:
Microbiology

Performed:
Daily

Methodology:
Culture

Remarks:
Use only dark green top, sodium heparin tubes for blood samples.

Collect:
Dark green top (DO NOT use Lithium heparin i.e. Light Green top tubes)

**Amount to Collect:**
- 5 mL blood

**Sample Type:**
- Heparinized whole blood

**Preferred Volume:**
- 5 mL blood

**Minimum Volume:**
- 1 mL blood

**Unacceptable Conditions:**
- Improper container type

**Specimen Preparation:**
Send sodium heparin tubes to China Basin. At China Basin, process upon receipt. Inoculate 3-5 mL into AFB culture bottle. Refer to BD BACTEC FX40 procedure.

**Reference Interval:**
- No AFB isolated

**Critical Values:**
Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB culture; Repeat call only for positive sample from different site or > 2 months since initial call.

**Synonyms:**
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacterium avium intercellulare complex
- MAI

**Stability (from collection to initiation):**
Room temperature or refrigerated 3 days

**Reported:**
- Up to 60 days

**Reflex Testing:**
If positive additional test(s) will be performed for identification of the mycobacteria and billed separately.

**Additional Information:**
Blood cultures are performed only for patients with a diagnosis of AIDS and are suitable only for detecting MAIC.

**CPT Codes:**
- 87116-90

**LOINC Codes:**
- 50941-4
AFB Culture, Cystic Fibrosis Respiratory
P287CF

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Daily, day shift
Methodology: Culture
Reported: Up to 7 weeks
Additional Information:
Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites.
Reflex Testing:
Mycobacterium tuberculosis complex DNA is automatically performed on respiratory specimens with positive smears, and billed separately.
Synonyms:
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacterium avium intercellulare complex
- MAI

COLLECTION

Sample Type: Sputum, BAL or bronchial wash
Collect:
Urine cup or sterile container
Amount to Collect:
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL
Minimum Volume:
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL
Remarks:
- Sputum: Collect 3 separate sputum samples in 8-12 hour intervals, including at least one early morning sample.
  Sputum samples collected < 8 hours apart are pooled & tested as a single specimen.
Stability (from collection to initiation):
Refrigerated 3 days

PROCESSING

Test Code:
P287CF
Test Group: Mycobacteria
Performing Lab: Microbiology

Specimen Preparation:

Sputum: Before accessioning, check if a sample was submitted earlier. If earlier sample was collected < 8 hours apart from the sample just received, call China Basin to check if earlier sample has been processed.

1. If earlier sample has not been processed, TND as duplicate and enter code AFPOOL. Inform submitting location that the sample is being pooled with the prior sample, and to collect an additional sputum. Affix a note to the sample stating “Pool sample for AFB with (accession # of earlier sample)”.

2. If earlier sample has been processed, TND as duplicate and freetext “Collect sputa for AFB culture 8 hours apart”.

Bronchial lavage/wash: Aliquot the maximum amount of specimen available (>10 mL) into a blue top centrifuge tube.

Bronchial brush:

1. Use sterile forceps to transfer brush to a 50 ml blue-topped centrifuge tube.

2. Add NPC 67 Neutralizing buffer to make a total volume of 2 mL.

3. Vortex thoroughly to expel specimen from the brush and then remove brush from tube.

Minimum Volume:

- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL

Stability (from collection to initiation):

Refrigerated 3 days

RESULT INTERPRETATION

Reference Interval:

No AFB isolated

Critical Values:

Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

Additional Information:

Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites.

ADMINISTRATIVE

CPT Codes:

87116, 87206, 87015

COMPLETE VIEW

Available Stat:

No

Test Code:

P287CF

Test Group:

Mycobacteria

Performing Lab:

Microbiology

Performed:

Daily, day shift
Methodology:
   Culture

Remarks:
   Sputum: Collect 3 separate sputum samples in 8-12 hour intervals, including at least one early morning sample.
   Sputum samples collected < 8 hours apart are pooled & tested as a single specimen.

Collect:
   Urine cup or sterile container

Amount to Collect:
   Sputum: 5 mL
   BAL or Bronchial wash: 10 mL

Sample Type:
   Sputum, BAL or bronchial wash

Minimum Volume:
   Sputum: 5 mL
   BAL or Bronchial wash: 10 mL

Specimen Preparation:
   Sputum: Before accessioning, check if a sample was submitted earlier. If earlier sample was collected < 8 hours apart from the sample just received, call China Basin to check if earlier sample has been processed.
   1. If earlier sample has not been processed, TND as duplicate and enter code AFPOOL. Inform submitting location that the sample is being pooled with the prior sample, and to collect an additional sputum. Affix a note to the sample stating “Pool sample for AFB with (accession # of earlier sample)”.
   2. If earlier sample has been processed, TND as duplicate and freetext “Collect sputa for AFB culture 8 hours apart”.

   Bronchial lavage/wash: Aliquot the maximum amount of specimen available (>10 mL) into a blue top centrifuge tube.

   Bronchial brush:
   1. Use sterile forceps to transfer brush to a 50 ml blue-topped centrifuge tube.
   2. Add NPC 67 Neutralizing buffer to make a total volume of 2 ml.
   3. Vortex thoroughly to expel specimen from the brush and then remove brush from tube.

Reference Interval:
   No AFB isolated

Critical Values:
   Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

Synonyms:
   - TB culture
   - AFB culture
   - tuberculosis
   - atypical mycobacteria
   - MAC
   - mycobacterium avium intercellulare complex
   - MAI

Stability (from collection to initiation):
   Refrigerated 3 days

Reported:
   Up to 7 weeks

Reflex Testing:
   Mycobacterium tuberculosis complex DNA is automatically performed on respiratory specimens with positive smears, and billed separately.

Additional Information:
Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites.

**CPT Codes:**
87116, 87206, 87015
AFB Culture, Non-Respiratory

ORDERING

Approval Required:
Yes for:
- CSF unless submitted by neurology or neurosurgery services
- Joint fluid
- Abdominal drainage
- Urine unless from urology patient
- < 2 ml fluid submitted

Contact Microbiology at 353-1268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Daily, day shift

Methodology:
Culture

Reported:
Up to 7 weeks

Additional Information:
Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites. Smears will be performed on appropriate samples.

Samples are run w/o smear when a positive result would not be interpretable because of relatively frequent contamination with nonpathogenic mycobacteria which cannot be reliably differentiated on smear (e.g., in urine), or for blood, bone marrow, CSF or pleural fluid where the yield of routine testing is low.

Tuberculous arthritis, meningitis, and urinary infection are extremely uncommon diagnoses at this hospital, and cultures should only be requested if the cellular response is highly suggestive of tuberculosis, if there is a history of tuberculosis or close contact with a case, if there is a positive tuberculin test, or if granulomas are found in a biopsy specimen.

Bone marrow is the preferred specimen in non-AIDS patients with disseminated disease, in whom the yield from blood is extremely low.

Synonyms:
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacterium avium intercellulare complex
- MAI

COLLECTION

Sample Type:
Bone marrow, CSF, body fluids, urine, unfixed tissue, FNA

Collect:
Bone marrow Isolator tube (available from hematology laboratory)
CSF tube
Sterile collection tube
TSB broth tube (Available from Microbiology processing area)
Amount to Collect:

Bone Marrow: 1 mL
CSF and other fluids: 15-20 mL (6 mL for peds)
Urine: Entire first AM void (Up to 3 samples may be collected on consecutive days)
Tissue: 5 cu mm

Preferred Volume:

Bone Marrow: 1 mL
CSF and other fluids: 15-20 mL (6 mL for peds)
Urine: Entire first AM void
Tissue: 5 cu mm

Minimum Volume:

Bone Marrow: 0.5 mL
CSF and other fluids: 2 mL
Urine: 10 mL
Tissue: 3 cu mm

Remarks:

Bone marrow: Isolator tubes for bone marrow samples are available from the Hematology laboratory.

Urine: Collect entire first AM void

Gastric lavage: Collect in the early morning. Patient should be fasting prior to collection.

FNA: TSB broth tubes for FNA samples are available from the Microbiology processing laboratory.

Note: the diagnostic yield for joint and body fluid samples is low. If mycobacterial infection is suspected from these sites, tissue is the preferred specimen.

Stability (from collection to initiation):

Blood and bone marrow Room temperature: 1 day
Other specimens Refrigerated: 3 days

Unacceptable Conditions:

Samples submitted on swabs or in formalin

PROCESSING

Test Code:
P284

Test Group:
Mycobacteria

Performing Lab:
Microbiology

Specimen Preparation:

Bone marrow: Store at room temperature until processed. Process specimen immediately upon receipt in microbiology

Gastric lavage: If processing will be delayed by more than 5 hours, give specimen to CLS to neutralize.

Tissue: Grind a piece of tissue using NPC 67 Neutralizing buffer and transfer to blue top centrifuge tube.

CSF: If approved, enter volume used for culture in SDES and AFBVOL in SREQ. (The yield of CSF AFB culture increases with greater specimen volume. Recommended volumes are > 6 ml for pediatrics and 15-20 ml for adults.)

Note: If CSF AFB smear is approved, alert AFB processor and do NOT credit AFB smear.

Preferred Volume:

Bone Marrow: 1 mL
CSF and other fluids: 15-20 mL (6 mL for peds)
Urine: Entire first AM void
Tissue: 5 cu mm

Minimum Volume:

Bone Marrow: 0.5 mL
CSF and other fluids: 2 mL
Urine: 10 mL

Test information subject to change
Tissue: 3 cu mm

**Unacceptable Conditions:**
- Samples submitted on swabs or in formalin

**Stability (from collection to initiation):**
- Blood and bone marrow: Room temperature: 1 day
- Other specimens: Refrigerated: 3 days

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**RESULT INTERPRETATION**

**Reference Interval:**
- No AFB isolated

**Critical Values:**
- Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

**Additional Information:**
- Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites. Smears will be performed on appropriate samples.
- Samples are run w/o smear when a positive result would not be interpretable because of relatively frequent contamination with nonpathogenic mycobacteria which cannot be reliably differentiated on smear (e.g., in urine), or for blood, bone marrow, CSF or pleural fluid where the yield of routine testing is low.
- Tuberculous arthritis, meningitis, and urinary infection are extremely uncommon diagnoses at this hospital, and cultures should only be requested if the cellular response is highly suggestive of tuberculosis, if there is a history of tuberculosis or close contact with a case, if there is a positive tuberculin test, or if granulomas are found in a biopsy specimen.
- Bone marrow is the preferred specimen in non-AIDS patients with disseminated disease, in whom the yield from blood is extremely low.

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**ADMINISTRATIVE**

**CPT Codes:**
- 87116, 87206

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**COMPLETE VIEW**

**Approval Required:**
- Yes for:
  - CSF unless submitted by neurology or neurosurgery services
  - Joint fluid
  - Abdominal drainage
  - Urine unless from urology patient
  - < 2 ml fluid submitted

- Contact Microbiology at 353-1268

**Available Stat:**
- No

**Test Code:**
- P284

**Test Group:**
- Mycobacteria

**Performing Lab:**
- Microbiology

**Performed:**
- Daily, day shift

**Methodology:**
- Culture

**Remarks:**
Bone marrow: Isolator tubes for bone marrow samples are available from the Hematology laboratory.

Urine: Collect entire first AM void

Gastric lavage: Collect in the early morning. Patient should be fasting prior to collection.

FNA: TSB broth tubes for FNA samples are available from the Microbiology processing laboratory.

Note: the diagnostic yield for joint and body fluid samples is low. If mycobacterial infection is suspected from these sites, tissue is the preferred specimen.

Collect:
- Bone marrow Isolator tube (available from hematology laboratory)
- CSF tube
- Sterile collection tube
- TSB broth tube (Available from Microbiology processing area)

Amount to Collect:
- Bone Marrow: 1 mL
- CSF and other fluids: 15-20 mL (6 mL for peds)
- Urine: Entire first AM void (Up to 3 samples may be collected on consecutive days)
- Tissue: 5 cu mm

Sample Type:
- Bone marrow, CSF, body fluids, urine, unfixed tissue, FNA

Preferred Volume:
- Bone Marrow: 1 mL
- CSF and other fluids: 15-20 mL (6 mL for peds)
- Urine: Entire first AM void
- Tissue: 5 cu mm

Minimum Volume:
- Bone Marrow: 0.5 mL
- CSF and other fluids: 2 mL
- Urine: 10 mL
- Tissue: 3 cu mm

Unacceptable Conditions:
- Samples submitted on swabs or in formalin

Specimen Preparation:
- Bone marrow: Store at room temperature until processed. Process specimen immediately upon receipt in microbiology
- Gastric lavage: If processing will be delayed by more than 5 hours, give specimen to CLS to neutralize.
- Tissue: Grind a piece of tissue using NPC 67 Neutralizing buffer and transfer to blue top centrifuge tube.
- CSF: If approved, enter volume used for culture in SDES and AFBVOL in SREQ. (The yield of CSF AFB culture increases with greater specimen volume. Recommended volumes are > 6 ml for pediatrics and 15-20 ml for adults.)
- Note: If CSF AFB smear is approved, alert AFB processor and do NOT credit AFB smear.

Reference Interval:
- No AFB isolated

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

Synonyms:
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacteriaum avium intercellulare complex
- MAI

**Stability (from collection to initiation):**
- Blood and bone marrow Room temperature: 1 day
- Other specimens Refrigerated: 3 days

**Reported:**
- Up to 7 weeks

**Additional Information:**
- Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from non-sterile sites. Smears will be performed on appropriate samples.

- Samples are run w/o smear when a positive result would not be interpretable because of relatively frequent contamination with nonpathogenic mycobacteria which cannot be reliably differentiated on smear (e.g., in urine), or for blood, bone marrow, CSF or pleural fluid where the yield of routine testing is low.

- Tuberculous arthritis, meningitis, and urinary infection are extremely uncommon diagnoses at this hospital, and cultures should only be requested if the cellular response is highly suggestive of tuberculosis, if there is a history of tuberculosis or close contact with a case, if there is a positive tuberculin test, or if granulomas are found in a biopsy specimen.

- Bone marrow is the preferred specimen in non-AIDS patients with disseminated disease, in whom the yield from blood is extremely low.

**CPT Codes:**
- 87116, 87206
AFB Respiratory Culture
P285R

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Daily, day shift
Methodology: Culture
Reported: Up to 7 weeks

Additional Information:
Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from nonsterile sites.

Reflex Testing:
Mycobacterium tuberculosis complex DNA is automatically performed on respiratory specimens with positive smears, and billed separately.

Synonyms:
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacterium avium intercellulare complex
- MAI

COLLECTION

Sample Type:
- Sputum, BAL, bronchial wash
Collect:
- Urine cup or sterile container
Amount to Collect:
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL
Preferred Volume:
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL
Minimum Volume:
- Sputum: 1 mL
- BAL or Bronchial wash: 2 mL
Remarks:
- Sputum: Collect 3 separate sputum samples in 8-12 hour intervals, including at least one early morning sample.
- Sputum samples collected < 8 hours apart are pooled & tested as a single specimen.
- Stability (from collection to initiation): Refrigerated 3 days.
Test Code:
P285R

Test Group:
Mycobacteria

Performing Lab:
Microbiology

Specimen Preparation:

Sputum: Before accessioning, check if a sample was submitted earlier. If earlier sample was collected < 8 hours apart from the sample just received, call China Basin to check if earlier sample has been processed.

1. If earlier sample has not been processed, TND as duplicate and enter code AFPOOL. Inform submitting location that the sample is being pooled with the prior sample, and to collect an additional sputum. Affix a note to the sample stating "Pool sample for AFB with (accession # of earlier sample)".

2. If earlier sample has been processed, TND as duplicate and freetext “Collect sputa for AFB culture 8 hours apart”.

Bronchial lavage/wash: Aliquot the maximum amount of specimen available (>10 mL) into a blue top centrifuge tube.

Bronchial brush:

1. Use sterile forceps to transfer brush to a 50 ml blue-topped centrifuge tube.

2. Add NPC 67 Neutralizing buffer to make a total volume of 2 ml. 3. Vortex thoroughly to expel specimen from the brush and then remove brush from tube.

Preferred Volume:
Sputum: 5 mL
BAL or Bronchial wash: 10 mL

Minimum Volume:
Sputum: 1 mL
BAL or Bronchial wash: 2 mL

Stability (from collection to initiation):
Refrigerated 3 days.

RESULT INTERPRETATION

Reference Interval:
No AFB isolated

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning.

First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

Additional Information:
Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from nonsterile sites.

ADMINISTRATIVE

CPT Codes:
87116, 87206, 87015

COMPLETE VIEW

Available Stat:
No

Test Code:
P285R
**Test Group:**
Mycobacteria

**Performing Lab:**
Microbiology

**Performed:**
Daily, day shift

**Methodology:**
Culture

**Remarks:**

- **Sputum:** Collect 3 separate sputum samples in 8-12 hour intervals, including at least one early morning sample.
  
  Sputum samples collected < 8 hours apart are pooled & tested as a single specimen.

- **Collect:**
  Urine cup or sterile container

**Amount to Collect:**
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL

**Sample Type:**
- Sputum, BAL, bronchial wash

**Preferred Volume:**
- Sputum: 5 mL
- BAL or Bronchial wash: 10 mL

**Minimum Volume:**
- Sputum: 1 mL
- BAL or Bronchial wash: 2 mL

**Specimen Preparation:**

- **Sputum:** Before accessioning, check if a sample was submitted earlier. If earlier sample was collected < 8 hours apart from the sample just received, call China Basin to check if earlier sample has been processed.
  
  1. If earlier sample has not been processed, TND as duplicate and enter code AFPOOL. Inform submitting location that the sample is being pooled with the prior sample, and to collect an additional sputum. Affix a note to the sample stating “Pool sample for AFB with (accession # of earlier sample)”.
  
  2. If earlier sample has been processed, TND as duplicate and freetext “Collect sputa for AFB culture 8 hours apart”.

- **Bronchial lavage/wash:** Aliquot the maximum amount of specimen available (>10 mL) into a blue top centrifuge tube.

- **Bronchial brush:**
  
  1. Use sterile forceps to transfer brush to a 50 mL blue-topped centrifuge tube.
  
  2. Add NPC 67 Neutralizing buffer to make a total volume of 2 mL. 3. Vortex thoroughly to expel specimen from the brush and then remove brush from tube.

**Reference Interval:**
No AFB isolated

**Critical Values:**
Inpatient results only. After hours outpatient results will be phoned the following morning.

First positive AFB smear, first positive AFB culture if smear negative or no smear, or first isolate of M. tuberculosis; Repeat call only for positive sample from different site or > 2 months since initial call.

**Synonyms:**
- TB culture
- AFB culture
- tuberculosis
- atypical mycobacteria
- MAC
- mycobacteria avium intercellulare complex
• MAI

Stability (from collection to initiation):
Refrigerated 3 days.

Reported:
Up to 7 weeks

Reflex Testing:
Mycobacterium tuberculosis complex DNA is automatically performed on respiratory specimens with positive smears, and billed separately.

Additional Information:
Smears will be performed on respiratory samples. Separate charges will be billed for AFB smear and AFB culture. Additional charges will be billed for decontamination of samples from nonsterile sites.

CPT Codes:
87116, 87206, 87015
Alanine transaminase, Plasma / Serum
ALT

ORDERING

Available Stat:  Yes
Performing Lab:  Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:  Test available 24 hours per day 7 days per week
Methodology:  Spectrophotometric, kinetic (non-activated alpha-ketoglutarate/NADH)
Reported:  STAT 1 hour, Routine 4 hours
Additional Information:  Excessive hemolysis causes mild elevation.
Synonyms:
- SGPT
- ALT
- glutamic-pyruvic transaminase
- glutamic-alanine transaminase
- GPT
- beta-alanine aminotransferase
- alanine aminotransferase
- alanine-alpha-ketoglutarate aminotransferase
- alanine-pyruvate aminotransferase
- glutamic acid-pyruvic acid transaminase
- glutamic-pyruvic aminotransferase
- L-alanine aminotransferase
- L-alanine transaminase
- L-alanine-alpha-ketoglutarate aminotransferase
- pyruvate transaminase
- pyruvate-alanine aminotransferase
- pyruvate-glutamate transaminase

COLLECTION

Sample Type:  Plasma or serum
Collect:  Light green top preferred, Gold top acceptable
Amount to Collect:  1 mL blood
Preferred Volume:  0.5 mL plasma or serum
Minimum Volume:  0.2 mL plasma or serum
Stability (from collection to initiation):  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
PROCESSING

Test Code:
ALT
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
U/L
Reference Interval:
Male
0 - 17 years 20-60 U/L
>=18 years 12-60 U/L

Female:
0 - 3 years 20-60 U/L
4 years - 17 years 20-50 U/L
>=18 years 11-50 U/L

Note:
2. Normal range for adults was determined by testing 269 male and female healthy blood donors at UCSF.

Additional Information:
Excessive hemolysis causes mild elevation.

ADMINISTRATIVE

CPT Codes:
84460
LOINC Codes:
1742-6

COMPLETEN VIEW

Available Stat:
Yes
Test Code:
ALT
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric, kinetic (non-activated alpha-ketoglutarate/NADH)
Collect:
Light green top preferred, Gold top acceptable

**Amount to Collect:**
1 mL blood

**Sample Type:**
Plasma or serum

**Preferred Volume:**
0.5 mL plasma or serum

**Minimum Volume:**
0.2 mL plasma or serum

**Units:**
U/L

**Reference Interval:**
- Male
  - 0 - 17 years: 20-60 U/L
  - >=18 years: 12-60 U/L

- Female
  - 0 - 3 years: 20-60 U/L
  - 4 years - 17 years: 20-50 U/L
  - >=18 years: 11-50 U/L

**Note:**
2. Normal range for adults was determined by testing 269 male and female healthy blood donors at UCSF.

**Synonyms:**
- SGPT
- ALT
- glutamic-pyruvic transaminase
- glutamic-alanine transaminase
- GPT
- beta-alanine aminotransferase
- alanine aminotransferase
- alanine-alpha-ketoglutarate aminotransferase
- alanine-pyruvate aminotransferase
- glutamic acid-pyruvic acid transaminase
- glutamic-pyruvic aminotransferase
- L-alanine aminotransferase
- L-alanine transaminase
- L-alanine-alpha-ketoglutarate aminotransferase
- pyruvate transaminase
- pyruvate-alanine aminotransferase
- pyruvate-glutamate transaminase

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- Excessive hemolysis causes mild elevation.

**CPT Codes:**
84460

**LOINC Codes:**
**Albumin (Microalbumin), 24 hour (or timed) urine**

**AU24**

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Immunology
- **Performed:** Monday, Wednesday & Friday (Day Shift)
- **Methodology:** Nephelometry
- **Reported:** 1-3 days

**Additional Information:**

Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

**Synonyms:**
- Microalbuminuria

**COLLECTION**

- **Sample Type:** 24 hour urine
- **Collect:** 24 hour urine collection container
- **Amount to Collect:** Entire 24 hour urine output
- **Preferred Volume:** 2 mL urine
- **Minimum Volume:** 0.5 mL urine
- **Remarks:** Refrigerate container during collection
  - Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
  - Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

**Unacceptable Conditions:**
- Container not refrigerated during collection.
Test Code: AU24
Performing Lab: Immunology
Specimen Preparation:
   Aliquot 2 mL. Note volume and hours collected. Order AU24.
Preferred Volume:
   2 mL urine
Minimum Volume:
   0.5 mL urine
Unacceptable Conditions:
   Container not refrigerated during collection.

RESULT INTERPRETATION

Units:
   mg/D
Reference Interval:
   24 hour collection:
   Normal  <30 mg/D
   Microalbuminuria 30-299 mg/D
   Nephropathy > 300 mg/D
Additional Information:
   Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

   Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

   Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
   82043

COMPLETE VIEW

Available Stat: No
Test Code: AU24
Performing Lab: Immunology
Performed:
   Monday, Wednesday & Friday (Day Shift)
Methodology:
   Nephelometry
Remarks:
Refrigerate container during collection

Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:

24 hour urine collection container

Amount to Collect:

Entire 24 hour urine output

Sample Type:

24 hour urine

Preferred Volume:

2 mL urine

Minimum Volume:

0.5 mL urine

Unacceptable Conditions:

Container not refrigerated during collection.

Specimen Preparation:

Aliquot 2 mL. Note volume and hours collected. Order AU24.

Units:

mg/D

Reference Interval:

24 hour collection:

- Normal <30 mg/D
- Microalbuminuria 30-299 mg/D
- Nephropathy > 300 mg/D

Synonyms:

- Microalbuminuria

Reported:

1-3 days

Additional Information:

Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

CPT Codes:

82043
Albumin (Microalbumin), random urine
AUR

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday, Wednesday and Friday (Day shift)
Methodology: Nephelometry
Reported: 1-3 days
Additional Information:
A creatinine is performed on the same sample to calculate the result and will be reported and billed separately.

Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

Synonyms:
- Microalbuminuria

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: 10-20 mL
Preferred Volume: 2 mL urine
Minimum Volume: 0.5 mL urine
Remarks:
First A.M. sample preferred for random urine.

PROCESSING

Test Code: AUR
Performing Lab: Immunology
Specimen Preparation:
Aliquot 2 mL, note that sample is a "spot" or random urine sample. Order AUR and CRUR.
Preferred Volume:
2 mL urine
Minimum Volume:
0.5 mL urine

RESULT INTERPRETATION

Units:
mg/g creatinine
Reference Interval:
Random urine:
  Normal <30 mg/g creatinine
  Microalbuminuria 30-299 mg/g creatinine
  Nephropathy > 300 mg/g creatinine
Additional Information:
A creatinine is performed on the same sample to calculate the result and will be reported and billed separately.

Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

ADMINISTRATIVE

CPT Codes:
82043
LOINC Codes:
14959-1

COMPLETE VIEW

Available Stat:
No
Test Code:
AUR
Performing Lab:
Immunology
Performed:
Monday, Wednesday and Friday (Day shift)
Methodology:
Nephelometry
Remarks:
First A.M. sample preferred for random urine.
Collect:
Urine cup
Amount to Collect:
10-20 mL
Sample Type:
Random urine
Preferred Volume:  
2 mL urine

Minimum Volume:  
0.5 mL urine

Specimen Preparation:  
Aliquot 2 mL, note that sample is a "spot" or random urine sample. Order AUR and CRUR.

Units:  
mg/g creatinine

Reference Interval:  
Random urine:
  - Normal  <30 mg/g creatinine
  - Microalbuminuria 30-299 mg/g creatinine
  - Nephropathy  > 300 mg/g creatinine

Synonyms:  
- Microalbuminuria

Reported:  
1-3 days

Additional Information:  
A creatinine is performed on the same sample to calculate the result and will be reported and billed separately.

Diabetes mellitus is one of the commonest causes of end-stage renal disease. The National Kidney Foundation recommends that diabetics > 12 years old be tested yearly for microalbuminuria if the rate of excretion is within normal limits (Amer J Kid Dis. 1995;25:107). The Diabetes Coalition of California recommends annual testing for microalbuminuria beginning 5 years after the diagnosis of type I diabetes mellitus and beginning at diagnosis of type II disease. The cost benefit of these strategies are not established.

Transient increases in urinary albumin excretion are seen with heavy exercise, urinary infection, acute febrile illness, heart failure and following the administration of NSIADs or ACE inhibitors, all of which should be avoided during screening. Because of the difficulty in collecting and accurately timing 24 hour samples, a spot collection is recommended and the albumin excretion is normalized for creatinine excretion, correcting to some extent for the diurnal fluctuation in urinary output. Abnormalities should be verified by a repeatedly positive assay within 6-12 weeks before a diagnosis of diabetic microalbuminuria or diabetic nephropathy is made.

CPT Codes:  
82043

LOINC Codes:  
14959-1
Albumin, Body Fluid
ALBB

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (bromcresol purple)

Reported:
4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

COLLECTION

Sample Type:
Body fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
0.3 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
ALBB

Test Group:
Albumin

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
0.3 mL fluid

Minimum Volume:
0.2 mL fluid
Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
  g/dL

Additional Information:
  As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

  All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

ADMINISTRATIVE

CPT Codes:
  82042

LOINC Codes:
  1747-5

COMPLETE VIEW

Available Stat:
  No

Ordering Recommendations:
  Not a routinely available test. See 'Additional information'

Test Code:
  ALBB

Test Group:
  Albumin

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 24 hours per day 7 days per week

Methodology:
  Spectrophotometric (brom cresol purple)

Remarks:
  Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
  Red top or clean container

Amount to Collect:
  5 mL fluid

Sample Type:
  Body fluid

Preferred Volume:
  0.3 mL fluid

Minimum Volume:
  0.2 mL fluid

Units:
  g/dL

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
4 hours

**Additional Information:**

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**

- 82042

**LOINC Codes:**

- 1747-5
Albumin, Plasma / Serum
ALB

ORDERING
Available Stat: Yes
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Spectrophotometric (bromcresol purple)
Reported:
  STAT 1 hour, Routine 4 hours
Additional Information:
  Also part of Protein Electrophoresis.

COLLECTION
Sample Type:
  Plasma or serum
Collect:
  Light green top preferred, Gold top acceptable
Amount to Collect:
  1 mL blood
Preferred Volume:
  0.5 mL plasma or serum
Minimum Volume:
  0.2 mL plasma or serum
Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING
Test Code:
  ALB
Test Group:
  Albumin
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
  0.5 mL plasma or serum
Minimum Volume:
  0.2 mL plasma or serum
Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION
Units:
  g/dL
Reference Interval:

Printed 06/07/19
Test information subject to change
Note:
2. Normal range for children 8 days to less than 18 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Additional Information:
Also part of Protein Electrophoresis.

ADMINISTRATIVE

CPT Codes:
82040

LOINC Codes:
1751-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
ALB

Test Group:
Albumin

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (brom cresol purple)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
g/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>1.9-4.0 g/dL</td>
</tr>
<tr>
<td>8 days - 11 months</td>
<td>2.7-4.8 g/dL</td>
</tr>
<tr>
<td>1 year - 17 years</td>
<td>3.1-4.8 g/dL</td>
</tr>
<tr>
<td>&gt;=18 years</td>
<td>3.5-4.8 g/dL</td>
</tr>
</tbody>
</table>

Note:
Brom cresol purple (BCP)
2. Normal range for children 8 days to less than 18 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- Also part of Protein Electrophoresis.

**CPT Codes:**
- 82040

**LOINC Codes:**
- 1751-7
ORDERING

Ordering Recommendations:
Identify ethanol, methanol, isopropanol, or acetone ingestion. For medical purposes only.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Gas Chromatography

Reported:
1-3 days

Synonyms:
- Acetone
- Alcohol, Blood
- Blood Alcohol Level
- Blood Ethanol Level
- Ethanol
- Ethyl Alcohol, Blood
- EtOH
- Isopropanol
- Methanol
- Volatiles Screen

COLLECTION

Patient Preparation:
For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.

Sample Type:
Serum or plasma

Collect:
Plain Red. Also acceptable: Lavender (EDTA), Pink (K$_2$EDTA), or Gray (Potassium Oxalate/Sodium Fluoride).

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

Stability (from collection to initiation):
After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Whole blood, Plasma Separator Tubes (PST), Serum Separator Tubes (SST).

PROCESSING

Test Code:
VOLAS

ARUP Test Code: 0090131

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL) Cap tube tightly to minimize alcohol loss.

Preferred Volume:
2 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

Unacceptable Conditions:
Whole blood, Plasma Separator Tubes (PST), Serum Separator Tubes (SST).

Stability (from collection to initiation):
After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Therapeutic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol (Includes Acetone)</td>
<td>Effective February 19, 2013</td>
</tr>
<tr>
<td></td>
<td>Components</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>No therapeutic range - Limit of detection: 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: &gt; 50 mg/dL</td>
</tr>
<tr>
<td>Acetone, Quantitative</td>
<td>No therapeutic range - Limit of detection: 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: &gt; 100 mg/dL</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Effective February 17, 2015</td>
</tr>
<tr>
<td></td>
<td>No therapeutic range - Test detection limit 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Therapy for Methanol</td>
</tr>
<tr>
<td></td>
<td>Toxic Level</td>
</tr>
<tr>
<td>Acetone, Quantitative</td>
<td>Therapeutic Range</td>
</tr>
<tr>
<td></td>
<td>Toxic Level</td>
</tr>
<tr>
<td>Methanol</td>
<td>No therapeutic range - Test detection limit 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: Greater than 20 mg/dL</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
80320 (Alt code: G0480)

COMPLETE VIEW

Ordering Recommendations:
Identify ethanol, methanol, isopropanol, or acetone ingestion. For medical purposes only.

Test Code:
VOLAS

ARUP Test Code:
0090131
Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Gas Chromatography

Patient Preparation:
For medical purposes only. Timing of specimen collection: Dependent on time of exposure, test upon presentation to hospital.

Collect:
Plain Red. Also acceptable: Lavender (EDTA), Pink (K$_2$EDTA), or Gray (Potassium Oxalate/Sodium Fluoride).

Amount to Collect:
4 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
2 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

Unacceptable Conditions:
Whole blood, Plasma Separator Tubes (PST), Serum Separator Tubes (SST).

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 2 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL) Cap tube tightly to minimize alcohol loss.

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Therapeutic Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol (Includes Acetone)</td>
<td>Effective February 19, 2013</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Isopropanol</td>
<td>No therapeutic range - Limit of detection: 5 mg/dL</td>
</tr>
<tr>
<td>Acetone, Quantitative</td>
<td>No therapeutic range - Limit of detection: 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: &gt; 50 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: &gt; 100 mg/dL</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Effective February 17, 2015</td>
</tr>
<tr>
<td></td>
<td>No therapeutic range - Test detection limit 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Therapy for Methanol: 100-200 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic Level: Greater than 250 mg/dL</td>
</tr>
<tr>
<td>Acetone, Quantitative</td>
<td>Therapeutic Range: Not well established. Limit of detection: 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic Level: Greater than 100 mg/dL</td>
</tr>
<tr>
<td>Methanol</td>
<td>No therapeutic range - Test detection limit 5 mg/dL</td>
</tr>
<tr>
<td></td>
<td>Toxic: Greater than 20 mg/dL</td>
</tr>
</tbody>
</table>

Synonyms:
- Acetone
- Alcohol, Blood
- Blood Alcohol Level
- Blood Ethanol Level
- Ethanol
- Ethyl Alcohol, Blood
- EtOH
- Isopropanol
- Methanol
• Volatiles Screen

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 1 week; Refrigerated: 2 weeks; Frozen: 1 month.

**Reported:**
1-3 days

**CPT Codes:**
80320 (Alt code: G0480)
Aldolase
ADSE

ORDERING

Available Stat:
No

Performing Lab:
Quest

Methodology:
UV, Kinetic

Reported:
Test run Tuesday-Saturday. Turnaround time 3-4 days.

Additional Information:
CK is the preferred test for the presence of muscle damage, aldolase being present in a wide variety of other organs, such as RBCs and liver.

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Remarks:
Avoid hemolysis

Unacceptable Conditions:
Hemolyzed samples

PROCESSING

Test Code:
ADSE

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Freeze serum at -20C. Order Quest # 66985P

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Hemolyzed samples

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
IU/L

Reference Interval:
- <24 months: 3.4-11.8 U/L
- 2-17 years: 3.4-8.6 U/L
- >= 18 year olds: <= 8.1 U/L

Additional Information:
CK is the preferred test for the presence of muscle damage, aldolase being present in a wide variety of other organs, such as RBCs and liver.

ADMINISTRATIVE

CPT Codes:
- 82085-90

LOINC Codes:
- 1761-6

COMPLETE VIEW

Available Stat:
No

Test Code:
ADSE

Performing Lab:
Quest

Sendout:
Yes

Methodology:
UV, Kinetic

Remarks:
Avoid hemolysis

Collect:
Gold top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Hemolyzed samples

Specimen Preparation:
Freeze serum at -20°C. Order Quest # 66985P

Units:
IU/L

Reference Interval:
- <24 months: 3.4-11.8 U/L
- 2-17 years: 3.4-8.6 U/L
- >= 18 year olds: <= 8.1 U/L

Reported:
Test run Tuesday-Saturday. Turnaround time 3-4 days.

Additional Information:
CK is the preferred test for the presence of muscle damage, aldolase being present in a wide variety of other organs, such as RBCs and liver.
liver.

CPT Codes:
82085-90

LOINC Codes:
1761-6
Aldosterone, serum
ALDO

ORDERING

Available Stat: No
Performing Lab: Chemistry China Basin
Performed: Test performed once a week (Tuesdays)
Methodology: Chemiluminescent Immunoassay - Diasorin Liaison XL
Additional Information: To convert ng/dL to nmol/L (SI units) multiply by 0.0277
Synonyms: Aldosterone, S

COLLECTION

Sample Type: blood
Collect: Red Top (preferred) or Gold Top (acceptable)
Amount to Collect: 3 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 400 uL serum
Remarks: Collect blood preferably midmorning, after the patient has been up (sitting, standing, or walking) for at least 2 hours and then seated quietly for 5-15 minutes before blood draw.
Bring samples immediately to laboratory for processing.
Stability (from collection to initiation): Stable for 5 days at 2-8C (refrigerated). Stable for 4 weeks at -20C (frozen).

PROCESSING

Test Code: ALDO
Test Group: Aldosterone
Performing Lab: Chemistry China Basin
Preferred Volume: 1 mL serum
Minimum Volume: 400 uL serum
Stability (from collection to initiation): Stable for 5 days at 2-8C (refrigerated). Stable for 4 weeks at -20C (frozen).
RESULT INTERPRETATION

Units:
ng/dL

Reference Interval:
ADULT (>= 18 year olds):
Upright 8:00-10:00 am <29 ng/dL
Upright 4:00-6:00 pm <22 ng/dL
Supine 8:00-10:00 am 3-16 ng/dL

Adult reference range adopted from Quest Diagnostics and verified in-house by running lab personnel.

PEDIATRICS:
1-12 months 2-70 ng/dL
1-4 years 2-37 ng/dL
5-9 years <10 ng/dL
10-13 years <22 ng/dL
14-17 years <36 ng/dL
Premature infants (31-35 weeks) <145 ng/dL
Term infants <218 ng/dL

TANNER STAGES: MALES FEMALES
Tanner Stages II-III 1 - 13 ng/dL 2 - 20 ng/dL
Tanner Stages IV-V 3 - 14 ng/dL 4 - 32 ng/dL

Pediatric reference range adopted from Quest Diagnostics.

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0277

ADMINISTRATIVE

CPT Codes:
82088

LOINC Codes:
1763-2

COMPLETE VIEW

Available Stat:
No

Test Code:
ALDO

Test Group:
Aldosterone

Performing Lab:
Chemistry China Basin

Performed:
Test performed once a week (Tuesdays)

Methodology:
Chemiluminescent Immunoassay - Diasorin Liaison XL

Remarks:
Collect blood preferably midmorning, after the patient has been up (sitting, standing, or walking) for at least 2 hours and then seated quietly for 5-15 minutes before blood draw.

Bring samples immediately to laboratory for processing.
Collect:
   Red Top (preferred) or Gold Top (acceptable)

Amount to Collect:
   3 mL blood

Sample Type:
   blood

Preferred Volume:
   1 mL serum

Minimum Volume:
   400 µL serum

Units:
   ng/dL

Reference Interval:
   ADULT (>= 18 year olds):
     Upright 8:00-10:00 am <29 ng/dL
     Upright 4:00-6:00 pm <22 ng/dL
     Supine 8:00-10:00 am 3-16 ng/dL

   Adult reference range adopted from Quest Diagnostics and verified in-house by running lab personnel.

PEDIATRICS:
   1-12 months  2-70 ng/dL
   1-4 years    2-37 ng/dL
   5-9 years    <10 ng/dL
   10-13 years  <22 ng/dL
   14-17 years  <36 ng/dL
   Premature infants (31-35 weeks) <145 ng/dL
   Term infants  <218 ng/dL

   TANNER STAGES: MALES    FEMALES
   Tanner Stages II-III  1 - 13 ng/dL 2 - 20 ng/dL
   Tanner Stages IV-V    3 - 14 ng/dL 4 - 32 ng/dL

   Pediatric reference range adopted from Quest Diagnostics.

Synonyms:
   • Aldosterone, S

Stability (from collection to initiation):
   Stable for 5 days at 2-8°C (refrigerated).
   Stable for 4 weeks at -20°C (frozen).

Additional Information:
   To convert ng/dL to nmol/L (SI units) multiply by 0.0277

CPT Codes:
   82088

LOINC Codes:
   1763-2
Aldosterone, urine
ALDU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Hydrolysis • Extraction • Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
Reported:
Test run Monday and Thursday. Turnaround: 3-7 days.
Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 2.77

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
5 mL urine
Minimum Volume:
1 mL urine
Remarks:
Refrigerate during collection.
Unacceptable Conditions:
Container not refrigerated during collection

PROCESSING

Test Code:
ALDU
Test Group:
Aldosterone
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate aliquot of the well-mixed collection. Record total volume on both transport vial and request slip. Order Quest # 7062N
Preferred Volume:
5 mL urine
Minimum Volume:
1 mL urine
Unacceptable Conditions:
Container not refrigerated during collection

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
µg/24 hours (mcg/24 hours)

Reference Interval:
On a typical diet containing 100-300 mmol Sodium per day:
2-7 years  <= 5.7 µg/d
8-11 years  <= 10.2 µg/d
12-16 years <= 15.6 µg/d
>= 18 year olds <= 2.3-21.0 µg/d

Post-fludrocortisone or IV saline suppression: < 5.0 µg/d

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 2.77

ADMINISTRATIVE

CPT Codes:
82088-90

LOINC Codes:
1765-7

COMPLETE VIEW

Available Stat:
No

Test Code:
ALDU

Test Group:
Aldosterone

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Hydrolysis • Extraction • Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)

Remarks:
Refrigerate during collection.

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
5 mL urine

Minimum Volume:
1 mL urine

Unacceptable Conditions:
Container not refrigerated during collection

Specimen Preparation:
Refrigerate aliquot of the well-mixed collection. Record total volume on both transport vial and request slip. Order Quest # 7062N

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:
On a typical diet containing 100-300 mmol Sodium per day:
2-7 years <= 5.7 μg/d
8-11 years <= 10.2 μg/d
12-16 years <= 15.6 μg/d
>= 18 year olds <= 2.3-21.0 μg/d

Post-fludrocortisone or IV saline suppression: < 5.0 μg/d

**Reported:**
Test run Monday and Thursday. Turnaround: 3-7 days.

**Additional Information:**
To convert μg/d to nmol/d (SI units) multiply by 2.77

**CPT Codes:**
82088-90

**LOINC Codes:**
1765-7
ALK 2p Break Apart Metaphase FISH
ALK2P, BALK2P

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-Situ Hybridization
Reported:
1-2 weeks
Synonyms:
- ALK2P
- BALK2P

COLLECTION

Sample Type:
- Heparinized blood or bone marrow aspirate
- Bone biopsy
Collect:
Blood or marrow aspirate: Dark Green top
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Remarks:
Mix blood and marrow aspirates well
Stability (from collection to initiation):
2 days at room temperature
Unacceptable Conditions:
Insufficient sample or not collected in heparin

PROCESSING

Test Code:
BALK2P: Blood
ALK2P: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Insufficient sample or not collected in heparin

**Stability (from collection to initiation):**
- 2 days at room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BALK2P: Blood
- ALK2P: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Methodology:**
- Fluorescent in-Situ Hybridization

**Remarks:**
- Mix blood and marrow aspirates well

**Collect:**
- Blood or marrow aspirate: Dark Green top

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Sample Type:**
- Heparinized blood or bone marrow aspirate
- Bone biopsy

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Insufficient sample or not collected in heparin

**Specimen Preparation:**
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

**Synonyms:**
- ALK2P
- BALK2P

**Stability (from collection to initiation):**
- 2 days at room temperature
Reported:
   1-2 weeks
CPT Codes:
   88271 x2, 88275
LDT or Modified FDA:
   Yes

Test information subject to change
# Alkaline Phosphatase, Bone-specific (BSAP)

## ORDERING

**Available Stat:**  
No

**Performing Lab:**  
Quest

**Methodology:**  
Immunoenzymatic

**Reported:**  
Test performed Tuesday and Thursday. Turnaround time: 3-8 days.

**Additional Information:**  
Pediatric data are taken from Intl J Biol Markers, 1956:11:159 and J Clin Endocrinol Metab, 1999

## COLLECTION

**Sample Type:**  
Serum

**Collect:**  
Red top or Gold top

**Amount to Collect:**  
2 mL blood

**Preferred Volume:**  
1 mL serum

**Minimum Volume:**  
0.3 mL serum

**Stability (from collection to initiation):**  
Room temperature 2 days, refrigerated 3 weeks, frozen at -20°C 3 months

**Unacceptable Conditions:**  
Hemolyzed, lipemic or grossly icteric samples. Plasma samples.

**Rejection Criteria:**  
Received at room temperature

## PROCESSING

**Test Code:**  
BSAP

**Sendout:**  
Yes

**Performing Lab:**  
Quest

**Specimen Preparation:**  
Freeze serum at -20°C. Order Quest # 29498

**Preferred Volume:**  
1 mL serum

**Minimum Volume:**  
0.3 mL serum

**Unacceptable Conditions:**  
Hemolyzed, lipemic or grossly icteric samples. Plasma samples.

**Rejection Criteria:**  
Received at room temperature
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 3 weeks, frozen at -20°C 3 months

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:

>= 18 year old males:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29 Years</td>
<td>8.4-29.3 µg/L</td>
</tr>
<tr>
<td>30-39 Years</td>
<td>7.7-21.3 µg/L</td>
</tr>
<tr>
<td>40-49 Years</td>
<td>7.0-18.3 µg/L</td>
</tr>
<tr>
<td>50-68 Years</td>
<td>7.6-14.9 µg/L</td>
</tr>
</tbody>
</table>

>= 18 year old females:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29 Years</td>
<td>4.7-17.8 µg/L</td>
</tr>
<tr>
<td>30-39 Years</td>
<td>5.3-19.5 µg/L</td>
</tr>
<tr>
<td>40-49 Years</td>
<td>5.0-18.8 µg/L</td>
</tr>
<tr>
<td>50-76 Years</td>
<td>5.6-29.0 µg/L</td>
</tr>
<tr>
<td>Premenopausal (35-45 Years)</td>
<td>5.0-18.2 µg/L</td>
</tr>
</tbody>
</table>

Pediatrics:

Males

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-24 Months</td>
<td>25.4-124.0 µg/L</td>
</tr>
<tr>
<td>6-9 Years</td>
<td>41.0-134.6 µg/L</td>
</tr>
<tr>
<td>10-13 Years</td>
<td>43.8-177.4 µg/L</td>
</tr>
<tr>
<td>14-17 Years</td>
<td>13.7-128.0 µg/L</td>
</tr>
</tbody>
</table>

Females

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-24 Months</td>
<td>25.4-124.0 µg/L</td>
</tr>
<tr>
<td>6-9 Years</td>
<td>41.0-134.6 µg/L</td>
</tr>
<tr>
<td>10-13 Years</td>
<td>24.2-154.2 µg/L</td>
</tr>
<tr>
<td>14-17 Years</td>
<td>10.5-75.2 µg/L</td>
</tr>
</tbody>
</table>

Additional Information:
Pediatric data are taken from Intl J Biol Markers, 1956:11:159 and J Clin Endocrinol Metab, 1999

ADMINISTRATIVE

CPT Codes:
84075-90

LOINC Codes:
17838-4

COMPLETE VIEW

Available Stat:
No

Test Code:
BSAP

Performing Lab:
Quest

Sendout:
Yes
Methodology:
   Immunoenzymatic

Collect:
   Red top or Gold top

Amount to Collect:
   2 mL blood

Sample Type:
   Serum

Preferred Volume:
   1 mL serum

Minimum Volume:
   0.3 mL serum

Rejection Criteria:
   Received at room temperature

Unacceptable Conditions:
   Hemolyzed, lipemic or grossly icteric samples. Plasma samples.

Specimen Preparation:
   Freeze serum at -20C. Order Quest # 29498

Units:
   µg/L (mcg/L)

Reference Interval:

>= 18 year old males:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range</th>
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<tr>
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>= 18 year old females:

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Pediatrics:

Males:

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Females:

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</tr>
<tr>
<td>14-17 Years</td>
<td>10.5-75.2 µg/L</td>
</tr>
</tbody>
</table>

Stability (from collection to initiation):
   Room temperature 2 days, refrigerated 3 weeks, frozen at -20C 3 months

Reported:
   Test performed Tuesday and Thursday. Turnaround time: 3-8 days.

Additional Information:
   Pediatric data are taken from Intl J Biol Markers, 1956:11:159 and J Clin Endocrinol Metab, 1999

CPT Codes:
   84075-90
LOINC Codes:
17838-4
Alkaline Phosphatase, Plasma / Serum
ALKP

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric, kinetic (aminomethyl propanol/nitrophenol phosphate)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Alkaline phosphatase isoenzymes are unreliable; use GGT to distinguish bone from liver enzyme if the source of elevation is unclear.
Synonyms:
• Alk phos
• AlkP
• Alk Ptase

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
ALKP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (U/L)</th>
<th>Female (U/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14 days</td>
<td>78-234</td>
<td>78-234</td>
</tr>
<tr>
<td>15 days - &lt;1 year</td>
<td>116-442</td>
<td>116-442</td>
</tr>
<tr>
<td>1-9 years</td>
<td>134-315</td>
<td>134-315</td>
</tr>
<tr>
<td>10-12 years</td>
<td>122-393</td>
<td>122-393</td>
</tr>
<tr>
<td>13-14 years</td>
<td>110-441</td>
<td>55-240</td>
</tr>
<tr>
<td>15-16 years</td>
<td>78-312</td>
<td>48-111</td>
</tr>
<tr>
<td>17-18 years</td>
<td>52-141</td>
<td>43-83</td>
</tr>
<tr>
<td>&gt;=19 years</td>
<td>31-95</td>
<td>31-95</td>
</tr>
</tbody>
</table>

Note:
1. Normal range for children and adolescents <19 years old adopted from CALIPER “Pediatric Reference Intervals”:
   https://app3.ccb.sickkids.ca/caliper/calipersearch/5
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Additional Information:
Alkaline phosphatase isoenzymes are unreliable; use GGT to distinguish bone from liver enzyme if the source of elevation is unclear.

CPT Codes:
- 84075

LOINC Codes:
- 6768-6
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-12 years</td>
<td>122-393</td>
</tr>
<tr>
<td>13-14 years</td>
<td>110-441</td>
</tr>
<tr>
<td>15-16 years</td>
<td>78-312</td>
</tr>
<tr>
<td>17-18 years</td>
<td>52-141</td>
</tr>
<tr>
<td>&gt;=19 years</td>
<td>31-95</td>
</tr>
</tbody>
</table>

Note:
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Synonyms:
- Alk phos
- AlkP
- Alk Ptase

Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
- Alkaline phosphatase isoenzymes are unreliable; use GGT to distinguish bone from liver enzyme if the source of elevation is unclear.

CPT Codes:
- 84075

LOINC Codes:
- 6768-6
Allergen, Food, Peanut Components IgE
PCOMP

ORDERING

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative ImmunoCAP Fluorescent Enzyme Immunoassay

Reported:
1-2 days

Synonyms:
• Peanut Component Package
• Peanut molecular allergy
• Peanut Test
• uKnow Peanut

COLLECTION

Patient Preparation:
Multiple patient encounters should be avoided

Sample Type:
Serum

Collect:
Serum separator tube (SST). Multiple specimen tubes should be avoided

Amount to Collect:
1.5 mL (blood)

Preferred Volume:
0.6 mL (serum)

Minimum Volume:
0.4 mL (serum)

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated

Unacceptable Conditions:
Hemolyzed, icteric, or lipemic specimens

PROCESSING

Test Code:
PCOMP

ARUP Test Code:
2007211

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 0.6 mL serum plus 0.1 mL for each additional allergen ordered to an ARUP Standard Transport Tube. (Min: 0.4 mL plus 0.04 mL for each allergen ordered)
Additional Processing Instructions:

This test should not be ordered in conjunction with an IGES for Peanut. This test code will take priority over an IGES order for Peanut.

Preferred Volume:
0.6 mL (serum)

Minimum Volume:
0.4 mL (serum)

Unacceptable Conditions:
Hemolyzed, icteric, or lipemic specimens

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated

RESULT INTERPRETATION

Reference Interval:
Effective August 18, 2014

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Effective 02/18/2014] Reporting Range (reported in kU/L)</td>
<td>Probability of IgE Mediated Clinical Reaction</td>
</tr>
<tr>
<td>Less than 0.10</td>
<td>No significant level detected</td>
</tr>
<tr>
<td>0.10 - 0.34</td>
<td>Clinical relevance undetermined</td>
</tr>
<tr>
<td>0.35 - 0.70</td>
<td>Low</td>
</tr>
<tr>
<td>0.71 - 3.50</td>
<td>Moderate</td>
</tr>
<tr>
<td>3.51 - 17.50</td>
<td>High</td>
</tr>
<tr>
<td>17.51 - 50.00</td>
<td>Very high</td>
</tr>
<tr>
<td>50.01 - 100.00</td>
<td>Very high</td>
</tr>
<tr>
<td>Greater than 100.00</td>
<td>Very high</td>
</tr>
</tbody>
</table>

Interpretive Data:

Allergen results of 0.10-0.34 kU/L for whole peanut are intended for specialist use as the clinical relevance is undetermined. Even though increasing ranges are reflective of increasing concentrations of allergen-specific IgE, these concentrations may not correlate with the degree of clinical response or skin testing results when challenged with a specific allergen. The correlation of allergy laboratory results with clinical history and in vivo reactivity to specific allergens is essential. A negative test may not rule out clinical allergy or even anaphylaxis.

ADMINISTRATIVE

CPT Codes:
86003; 86008 x5

LOINC:
- 6206-7
- 58779-0
- 58778-2
- 58777-4
- 64965-7
- 63477-4
Test Code:
PCOMP
ARUP Test Code:
2007211
Performing Lab:
ARUP
Sendout:
Yes
Performed:
Sun-Sat
Methodology:
Quantitative ImmunoCAP Fluorescent Enzyme Immunoassay
Patient Preparation:
Multiple patient encounters should be avoided
Collect:
Serum separator tube (SST). Multiple specimen tubes should be avoided
Amount to Collect:
1.5 mL (blood)
Sample Type:
Serum
Preferred Volume:
0.6 mL (serum)
Minimum Volume:
0.4 mL (serum)
Unacceptable Conditions:
Hemolyzed, icteric, or lipemic specimens
Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 0.6 mL serum plus 0.1 mL for each additional allergen ordered to an ARUP Standard Transport Tube. (Min: 0.4 mL plus 0.04 mL for each allergen ordered)
Additional Processing Instructions:
This test should not be ordered in conjunction with an IGES for Peanut. This test code will take priority over an IGES order for Peanut.
Reference Interval:
Effective August 18, 2014

<table>
<thead>
<tr>
<th>Components</th>
<th>Reporting Range (reported in kU/L)</th>
<th>Probability of IgE Mediated Clinical Reaction</th>
<th>Class Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergen, Food, Peanut</td>
<td>Effective 02/18/2014</td>
<td>Allergic Reaction</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Less than 0.10</td>
<td>No significant level detected</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0.10 - 0.34</td>
<td>Clinical relevance undetermined</td>
<td>0/1</td>
</tr>
<tr>
<td></td>
<td>0.35 - 0.70</td>
<td>Low</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>0.71 - 3.50</td>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3.51 - 17.50</td>
<td>High</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>17.51 - 50.00</td>
<td>Very high</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>50.01 - 100.00</td>
<td>Very high</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Greater than 100.00</td>
<td>Very high</td>
<td>6</td>
</tr>
<tr>
<td>Allergen, Food, Severe Peanut Ara h 1</td>
<td>0.09 kU/L or less</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Allergen, Food, Severe Peanut Ara h 2</td>
<td>0.09 kU/L or less</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Allergen, Food, Severe Peanut Ara h 3</td>
<td>0.09 kU/L or less</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Allergen, Food, Severe Peanut Ara h 9</td>
<td>0.09 kU/L or less</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Interpretive Data:

Allergen results of 0.10-0.34 kU/L for whole peanut are intended for specialist use as the clinical relevance is undetermined. Even though increasing ranges are reflective of increasing concentrations of allergen-specific IgE, these concentrations may not correlate with the degree of clinical response or skin testing results when challenged with a specific allergen. The correlation of allergy laboratory results with clinical history and in vivo reactivity to specific allergens is essential. A negative test may not rule out clinical allergy or even anaphylaxis.

Synonyms:
- Peanut Component Package
- Peanut molecular allergy
- Peanut Test
- uKnow Peanut

Storage/Transport Temperature:
- Refrigerated

Stability (from collection to initiation):
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Reported:
- 1-2 days

CPT Codes:
- 86003; 86008 x5

LOINC:
- 62067
- 58779-0
- 58778-2
- 58777-4
- 64965-7
- 63477-4
- 11526-1
- 48767-8

Notes:
Test methodology uses solid-phase immunoassays against the whole peanut allergen (f13) and 5 antigenic epitopes (Ara h1, Ara h2, Ara h3, Ara h8, and Ara h9) and measures IgE antibody concentrations in patient serum or plasma. The binding of a specific IgE to an immobilized allergen component is detected by the addition of a secondary fluorescence-labeled anti-human IgE antibody.
AlloSure dd-cfDNA Test
ALLOS

ORDERING

Performing Lab: CareDx
Methodology: Targeted Next Generation Sequencing
Reported: 3-5 days
Additional Information: The AlloSure test is intended to assess the probability of allograft rejection in kidney transplant recipients with clinical suspicion of rejection and to inform clinical decision-making about the necessity of renal biopsy in such patients at least 2 weeks post-transplant in conjunction with standard clinical assessment.

COLLECTION

Sample Type: Whole blood
Collect: Streck Cell-Free DNA BCT® (Streck Tube)
Amount to Collect: 20 mL
Preferred Volume: 20 mL
Minimum Volume: 20 mL
Remarks: Collection kit is required for this testing. Kit it to be brought by the patient from the ordering clinic.
Stability (from collection to initiation): 7 days

PROCESSING

Test Code: ALLOS
Sendout: Yes
Performing Lab: CareDx
Specimen Preparation: Collection kit is required for processing. After collection kit is to be shipped from drawing location.
Preferred Volume: 20 mL
Minimum Volume: 20 mL
Stability (from collection to initiation): 7 days
**RESULT INTERPRETATION**

**Additional Information:**

The AlloSure test is intended to assess the probability of allograft rejection in kidney transplant recipients with clinical suspicion of rejection and to inform clinical decision-making about the necessity of renal biopsy in such patients at least 2 weeks post-transplant in conjunction with standard clinical assessment.

**ADMINISTRATIVE**

**CPT Codes:**

81479

**COMPLETE VIEW**

**Test Code:**

ALLOS

**Performing Lab:**

CareDx

**Sendout:**

Yes

**Methodology:**

Targeted Next Generation Sequencing

**Remarks:**

Collection kit is required for this testing. Kit it to be brought by the patient from the ordering clinic.

**Collect:**

Streck Cell-Free DNA BCT® (Streck Tube)

**Amount to Collect:**

20 mL

**Sample Type:**

Whole blood

**Preferred Volume:**

20 mL

**Minimum Volume:**

20 mL

**Rejection Criteria:**

Frozen samples. Hemolysis.

**Specimen Preparation:**

Collection kit is required for processing. After collection kit is to be shipped from drawing location.

**Stability (from collection to initiation):**

7 days

**Reported:**

3-5 days

**Additional Information:**

The AlloSure test is intended to assess the probability of allograft rejection in kidney transplant recipients with clinical suspicion of rejection and to inform clinical decision-making about the necessity of renal biopsy in such patients at least 2 weeks post-transplant in conjunction with standard clinical assessment.

**CPT Codes:**

81479
Alpha Fetoprotein (Amniotic Fluid) with Reflex to Acetylcholinesterase and Fetal Hemoglobin
AFPAF

ORDERING

Ordering Recommendations:
Evaluate possibility of a fetal open neural tube defect at 13-36 weeks of gestation.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Chemiluminescent Immunoassay/Electrophoresis

Reported:
3-4 days
Reflex: 3-11 days

Additional Information:
Evaluate possibility of a fetal open neural tube defect at 13-36 weeks of gestation.

Reflex Testing:
If the AFP (amniotic fluid) is elevated, then Acetylcholinesterase will be added. Additional charges apply. Acetylcholinesterase testing requires an additional 3-11 days to be reported.

Synonyms:
- AFP
- AFP-AF (Alpha-Fetoprotein, Amniotic Fluid)
- Alpha Fetoprotein, Amniotic Fluid
- Alpha-Fetoprotein, Amniotic Fluid
- Fetoprotein, Amniotic Fluid

COLLECTION

Patient Preparation:
Amniocentesis. Specimen must be drawn between 13 weeks, 0 days and 36 weeks, 6 days gestation.

Sample Type:
Amniotic fluid in sterile container

Collect:
Amniotic fluid.

Amount to Collect:
2.5 mL

Preferred Volume:
2.5 mL

Minimum Volume:
1.5 mL

Remarks:
Submit with Order: Gestational age at time of collection or estimated due date.

Stability (from collection to initiation):
Ambient: 1 month; Refrigerated: 3 months; Frozen: 3 months

Storage/Transport Temperature:
Room temperature.

PROCESSING

Test Code:
AFPAF

ARUP Test Code:
3000142

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transport 2.5 mL amniotic fluid. (Min: 1.5 mL)

Preferred Volume:
2.5 mL

Minimum Volume:
1.5 mL

Stability (from collection to initiation):
Ambient: 1 month; Refrigerated: 3 months; Frozen: 3 months

Storage/Transport Temperature:
Room temperature.

RESULT INTERPRETATION

Reference Interval:

<table>
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<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP, Amniotic Fluid</td>
<td>By report</td>
</tr>
<tr>
<td></td>
<td>Ranges are based upon the weeks of gestation.</td>
</tr>
<tr>
<td>Acetylcholinesterase and Fetal Hemoglobin, Amniotic Fluid</td>
<td>Acetylcholinesterase: Negative</td>
</tr>
<tr>
<td></td>
<td>Fetal Hemoglobin: Negative</td>
</tr>
<tr>
<td>Multiple of Median</td>
<td>1.99 or less</td>
</tr>
</tbody>
</table>

Additional Information:
Evaluate possibility of a fetal open neural tube defect at 13-36 weeks of gestation.

Interpretive Data:
Refer to report.

ADMINISTRATIVE

CPT Codes:
82106; if reflexed, add 82013 and 83033

LOINC:
- 1832-5
- 41273-4
- 29595-6
- 18185-9
- 11778-8
- 8665-2

LOINC Codes:
1832-5, 41273-4, 29595-6, 18185-9

COMPLETE VIEW

Ordering Recommendations:
Evaluate possibility of a fetal open neural tube defect at 13-36 weeks of gestation.

Test Code:
AFPAF

ARUP Test Code:
3000142

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Chemiluminescent Immunoassay/Electrophoresis

Patient Preparation:
Amniocentesis. Specimen must be drawn between 13 weeks, 0 days and 36 weeks, 6 days gestation.

Remarks:
Submit with Order: Gestational age at time of collection or estimated due date.

Collect:
Amniotic fluid.

Amount to Collect:
2.5 mL

Sample Type:
Amniotic fluid in sterile container

Preferred Volume:
2.5 mL

Minimum Volume:
1.5 mL

Specimen Preparation:
Transport 2.5 mL amniotic fluid. (Min: 1.5 mL)

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFP, Amniotic Fluid</td>
<td>By report</td>
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</tr>
<tr>
<td>Multiple of Median</td>
<td>1.99 or less</td>
</tr>
</tbody>
</table>

Interpretive Data:
Refer to report.

Synonyms:
- AFP
- AFP-AF (Alpha-Fetoprotein, Amniotic Fluid)
- Alpha Fetoprotein, Amniotic Fluid
- Alpha-Fetoprotein, Amniotic Fluid
- Fetoprotein, Amniotic Fluid

Storage/Transport Temperature:
Room temperature.

Stability (from collection to initiation):
Ambient: 1 month; Refrigerated: 3 months; Frozen: 3 months

Reported:
3-4 days
Reflex: 3-11 days

Reflex Testing:
If the AFP (amniotic fluid) is elevated, then Acetylcholinesterase will be added. Additional charges apply. Acetylcholinesterase testing requires an additional 3-11 days to be reported.
**Additional Information:**
Evaluate possibility of a fetal open neural tube defect at 13-36 weeks of gestation.

**CPT Codes:**
- 82106; if reflexed, add 82013 and 83033

**LOINC:**
- 1832-5
- 41273-4
- 29595-6
- 18185-9
- 11778-8
- 8665-2

**LOINC Codes:**
- 1832-5, 41273-4, 29595-6, 18185-9

**Notes:**
Information must include weeks of gestation. If the AFP (amniotic fluid) is elevated, then Acetylcholinesterase will be added. Additional charges apply. Acetylcholinesterase testing requires an additional 3-11 days to be reported.
# Alpha Fetoprotein, Total and L3 Percent

**AFPL3**

## ORDERING

**Ordering Recommendations:**
Surveillance and monitoring of hepatocellular carcinoma.

**Performing Lab:**
ARUP

**Performed:**
Mon, Thu

**Methodology:**
Quantitative Liquid Chromatography/Immunoassay

**Reported:**
1-5 days

**Synonyms:**
- AFP, AFP-L3%, Hepatocellular carcinoma marker, HCC marker
- AFP
- AFP-L3%
- Alpha Fetoprotein
- Alpha Fetoprotein, Total and L3 Percent
- Alpha-Fetoprotein (AFP) L3% and Total, Hepatocellular Carcinoma Tumor Marker, Serum
- Alpha-fetoprotein, Total
- Hepatocellular Carcinoma AFP
- Total AFP

## COLLECTION

**Sample Type:**
Serum

**Collect:**
Serum separator tube.

**Amount to Collect:**
2 mL (blood)

**Preferred Volume:**
1 mL (serum)

**Minimum Volume:**
0.5 mL (serum)

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 3 months (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
Frozen.

**Unacceptable Conditions:**
Plasma.

**Rejection Criteria:**
Plasma

## PROCESSING

**Test Code:**
AFPL3
ARUP Test Code: 0081208
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation: Allow specimen to clot completely at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Preferred Volume: 1 mL (serum)
Minimum Volume: 0.5 mL (serum)
Unacceptable Conditions: Plasma.
Rejection Criteria: Plasma
Stability (from collection to initiation): After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 3 months (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature: Frozen.

RESULT INTERPRETATION

Units: ng/mL, percent
Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha Fetoprotein Total</td>
<td>0-15 ng/mL</td>
</tr>
<tr>
<td>Alpha Fetoprotein L3 Pct</td>
<td>0-9.9 percent</td>
</tr>
</tbody>
</table>

Interpretive Data:
The µTASWako method is used. Results obtained with different assay methods or kits cannot be used interchangeably. The AFP L3 Percent assay is intended as a risk assessment for the development of hepatocellular carcinoma in patients with chronic liver diseases. Patients with elevated serum AFP-L3 percent should be more intensely evaluated for evidence of hepatocellular carcinoma since elevated values have been shown to be associated with a seven-fold increase in the risk for developing hepatocellular carcinoma within 21 months. For pregnant females, the result is not interpretable as a tumor marker.

ADMINISTRATIVE

CPT Codes: 82107
LOINC Codes: 1834-1, 42332-7

COMPLETE VIEW

Ordering Recommendations: Surveillance and monitoring of hepatocellular carcinoma.
Test Code: AFPL3
ARUP Test Code: 0081208
Performing Lab: ARUP
Sendout: Yes
Performed: Mon, Thu
Methodology: Quantitative Liquid Chromatography/Immunoassay
Collect: Serum separator tube.
Amount to Collect: 2 mL (blood)
Sample Type: Serum
Preferred Volume: 1 mL (serum)
Minimum Volume: 0.5 mL (serum)
Rejection Criteria: Plasma
Unacceptable Conditions: Plasma.
Specimen Preparation:
Allow specimen to clot completely at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Units: ng/mL, percent
Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha Fetoprotein Total</td>
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Interpretive Data:
The µTASWako method is used. Results obtained with different assay methods or kits cannot be used interchangeably. The AFP L3 Percent assay is intended as a risk assessment for the development of hepatocellular carcinoma in patients with chronic liver diseases. Patients with elevated serum AFP-L3 percent should be more intensely evaluated for evidence of hepatocellular carcinoma since elevated values have been shown to be associated with a seven-fold increase in the risk for developing hepatocellular carcinoma within 21 months. For pregnant females, the result is not interpretable as a tumor marker.

Synonyms:
- AFP, AFP-L3%, Hepatocellular carcinoma marker, HCC marker
- AFP
- AFP-L3%
- Alpha Fetoprotein
- Alpha Fetoprotein, Total and L3 Percent
- Alpha-Fetoprotein (AFP) L3% and Total, Hepatocellular Carcinoma Tumor Marker, Serum
- Alpha-fetoprotein, Total
- Hepatocellular Carcinoma AFP
- Total AFP

Storage/Transport Temperature: Frozen.
Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 5 days; Frozen: 3 months (avoid repeated freeze/thaw cycles)
Reported:
  1-5 days
CPT Codes:
  82107
LOINC Codes:
  1834-1, 42332-7
ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
RIA
Reported:
Test run Tuesday, and Thursday. Turnaround time: 3-8 days.

Synonyms:
- FSH
- HCG
- LH
- TSH
- Alpha-PGH
- Alpha-TSH
- Alpha chains

COLLECTION

Sample Type:
Serum
Collect:
Red top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks
Unacceptable Conditions:
Hemolyiss, lipemia
Rejection Criteria:
Hemolyiss, lipemia

PROCESSING

Test Code:
ASUB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum, Order Quest #8658X.
For Brown & Toland patients: order BTMOLT and FREEZE serum, Order LabCorp #140269.

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Hemolyss, lipemia

**Rejection Criteria:**
- Hemolyss, lipemia

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks

---

**RESULT INTERPRETATION**

**Units:**
- ng/mL

**Reference Interval:**
- Males <= 0.6 ng/mL
- Premenopausal females <= 1.5 ng/mL
- Postmenopausal females 0.9-3.3 ng/mL
- Pregnancy (1st & 2nd Trimest) 1.8-360 ng/mL
- Hypothyroid patients <= 3.7 ng/mL

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**ADMINISTRATIVE**

**CPT Codes:**
- 83159-90

**LOINC Codes:**
- 30199-4

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**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- ASUB

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- RIA

**Collect:**
- Red top preferred, Gold top acceptable

**Amount to Collect:**
- 4 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Rejection Criteria:**
- Hemolyss, lipemia

**Unacceptable Conditions:**
- Hemolyss, lipemia

Test information subject to change.
Hemolyiss, lipemia

**Specimen Preparation:**
Freeze serum, Order Quest #8658X.

For Brown & Toland patients: order BTMOLT and FREEZE serum, Order LabCorp #140269.

**Units:**
ng/mL

**Reference Interval:**
- **Males** <= 0.6 ng/mL
- Premenopausal females <= 1.5 ng/mL
- Postmenopausal females 0.9-3.3 ng/mL
- Pregnancy (1st & 2nd Trimest) 1.8-360 ng/mL
- Hypothyroid patients <= 3.7 ng/mL

**Synonyms:**
- FSH
- HCG
- LH
- TSH
- Alpha-PGH
- Alpha-TSH
- Alpha chains

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks

**Reported:**
Test run Tuesday, and Thursday. Turnaround time: 3-8 days.

**CPT Codes:**
83159-90

**LOINC Codes:**
30199-4
Alpha Thalassemia mutations
ATHL

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run 1x per week as needed
Methodology: PCR and gel electrophoresis
Reported: 7-14 days
Additional Information:

If this assay fails to detect a deletion and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. Such variants can be detected using our Alpha-globin Gene Sequencing assay (test code AGSQ), which determines the DNA sequence of both alpha1 and alpha2 globin genes and detects the presence of point mutations that result in alpha thalassemia.

There are four alpha globin genes per diploid genome, with two genes located on each chromosome. The most common molecular abnormalities that cause alpha thalassemia are alpha globin gene deletions, which can result in either one or two alpha globin gene deletions per chromosome. Although point mutations that cause alpha thalassemia occur in the alpha globin genes, these are not common and may be found in individuals from inbred populations.

This test detects seven deletions that cause alpha thalassemia in various worldwide populations. These are:

1) Rightward (- alpha 3.7): one alpha globin gene deletion. (alpha thal-2). It is the most common type of alpha thal-2 deletion found in numerous populations worldwide such as in African, Mediterranean and Far Eastern populations. This test will detect the common and Hawaiian variants of this deletion.

2) Leftward (- alpha 4.2): one alpha globin gene deletion. (alpha thal-2). This deletion is much less prevalent than the rightward deletion and occurs in multiple populations.

3) Southeast Asian (- - SEA): Two alpha globin gene deletion. (alpha thal-1). Found in Southeast Asian populations, mostly China.

4) Filipino (FIL): Two alpha globin gene deletion. (alpha thal-2). Found predominantly in Filipinos and Hawaiians. Fetuses homozygous for this deletion are usually aborted due to the deletion of genes that encode embryonic zeta chains.

5) Thai (THAI): Two alpha globin gene deletion. (alpha thal-2). Found predominantly in Southeast Asian individuals (Thailand). Fetuses homozygous for this deletion are usually aborted due to the deletion of genes that encode embryonic zeta chains.


7) 20.5 Kb: Two alpha globin gene deletion. (alpha thal-2). Found in various Mediterranean and Central Asian populations.

The most clinically significant situation arises when each parent is a carrier of a 2 alpha-globin gene deletion in cis (−/−aa). Fetuses of such couples are at 25% risk for hydrops fetalis. Fetuses of couples where one partner is a carrier of a 2 alpha-globin gene deletion and the other is a carrier of a single alpha-globin gene deletion are at 25% risk for Hb H disease (−/−a).

This test is often used to assess whether a low MCV is caused by the inheritance of alpha-thalassemia either alone or in combination with iron deficiency and/or beta-thalassemia.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:
• Alpha thalassemia-1
• Alpha thalassemia-2

**COLLECTION**

Sample Type:
- EDTA whole blood
- Amniotic fluid
- Cultured amniocytes
- Chorionic villi
- Cultured chorionic villi

Collect:
- Lavender top

Amount to Collect:
- Blood: 5 ml
- Amniotic fluid: 20 ml
- Cultures amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks

Preferred Volume:
- Blood: 5 ml
- Amniotic fluid: 20 ml
- Cultures amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks

Minimum Volume:
- Blood: 2 ml
- Amniotic fluid: 10 ml
- Cultures amniocytes: 1 T25 flasks
- Chorionic villi: 10 mg
- Cultured chorionic villi: 1 T25 flasks

Remarks:
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Unacceptable Conditions:
- Heparinized samples. Tissue flasks with poorly confluence cultures. Insufficient amount of amniotic fluid or chorionic villi

**PROCESSING**

Test Code:
- ATHL

Test Group:
- Thalassemia

Performing Lab:
- Medical Genomics - Molecular Diagnostics

Specimen Preparation:
- Do not centrifuge, do not freeze, Refrigerate samples and ship at room temperature.

Preferred Volume:
- Blood: 5 ml
- Amniotic fluid: 20 ml
- Cultures amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks

Minimum Volume:
- Blood: 2 ml
- Amniotic fluid: 10 ml
- Cultures amniocytes: 1 T25 flasks
- Chorionic villi: 10 mg
- Cultured chorionic villi: 1 T25 flasks
Unacceptable Conditions:
Heparinized samples. Tissue flasks with poorly confluence cultures. Insufficient amount of amniotic fluid or chorionic villi

RESULT INTERPRETATION

Reference Interval:
Negative. No alpha globin gene deletions detected.

Additional Information:
If this assay fails to detect a deletion and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. Such variants can be detected using our Alpha-globin Gene Sequencing assay (test code AGSQ), which determines the DNA sequence of both alpha1 and alpha2 globin genes and detects the presence of point mutations that result in alpha thalassemia.

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7) 20.5 Kb: Two alpha globin gene deletion. (alpha thal-2). Found in various Mediterranean and Central Asian populations.

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This test is often used to assess whether a low MCV is caused by the inheritance of alpha-thalassemia either alone or in combination with iron deficiency and/or beta-thalassemia.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

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ADMINISTRATIVE

CPT Codes:
81257

LDT or Modified FDA:
Yes

LOINC Codes:
21687-9
Available Stat: No
Test Code: ATHL
Test Group: Thalassemia
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run 1x per week as needed
Methodology: PCR and gel electrophoresis
Remarks: Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Collect: Lavender top
Amount to Collect:
- Blood: 5 ml
- Amniotic fluid: 20 ml
- Cultures amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks
Sample Type:
- EDTA whole blood
- Amniotic fluid
- Cultured amniocytes
- Chorionic villi
- Cultured chorionic villi
Preferred Volume:
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- Amniotic fluid: 20 ml
- Cultures amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks
Minimum Volume:
- Blood: 2 ml
- Amniotic fluid: 10 ml
- Cultures amniocytes: 1 T25 flasks
- Chorionic villi: 10 mg
- Cultured chorionic villi: 1 T25 flasks
Unacceptable Conditions:
- Heparinized samples. Tissue flasks with poorly confluence cultures. Insufficient amount of amniotic fluid or chorionic villi
Specimen Preparation:
- Do not centrifuge, do not freeze, Refrigerate samples and ship at room temperature.
Reference Interval:
- Negative. No alpha globin gene deletions detected.
Synonyms:
- Alpha thalassemia-1
- Alpha thalassemia-2
Reported:
- 7-14 days
Additional Information:
If this assay fails to detect a deletion and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. Such variants can be detected using our
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This test is often used to assess whether a low MCV is caused by the inheritance of alpha-thalassemia either alone or in combination with iron deficiency and/or beta-thalassemia.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
81257

LDT or Modified FDA:
Yes

LOINC Codes:
21687-9
Alpha-1-Antitrypsin, clearance
A1AC

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Rate nephelometry
Reported:
Test performed Monday-F. Turnaround time: 3-4 days.
Synonyms:
- A1AT
- A1-AT
- Alpha-1-PI
- Alpha-1-Protease inhibitor
- A1-Antitrypsin
- A1-PI
- A1-Protease inhibitor

COLLECTION

Sample Type:
24 hour Stool collection & serum
Collect:
Collect stool only in special 24 hour collection container white with Red cap available in clinical labs. Submit with Gold top
Amount to Collect:
Entire 24 hour stool output
2 mL blood (Gold top)
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
A1AC
Test Group:
Alpha-1-Antitrypsin
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Freeze stool and serum at -20C and ship both on dry ice to Mayo Medical Laboratories. IMPORTANT: If only an aliquot of the homogenized stool is sent to the reference laboratory, record and send the weight of the entire 24 hour collection and the volume of any distilled water added to homogenize the sample with the specimens. Order MAYO# 8835. Call MCS for pickup.
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Units:
mL/24 h

Reference Interval:
Clearance: <= 27 mL/d

ADMINISTRATIVE

CPT Codes:
82103-90 x2.

LOINC Codes:
18271-7

COMPLETE VIEW

Available Stat:
No

Test Code:
A1AC

Test Group:
Alpha-1-Antitrypsin

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Rate nephelometry

Collect:
Collect stool only in special 24 hour collection container white with Red cap available in clinical labs. Submit with Gold top

Amount to Collect:
Entire 24 hour stool output
2 mL blood (Gold top)

Sample Type:
24 hour Stool collection & serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze stool and serum at -20C and ship both on dry ice to Mayo Medical Laboratories. IMPORTANT: If only an aliquot of the homogenized stool is sent to the reference laboratory, record and send the weight of the entire 24 hour collection and the volume of any distilled water added to homogenize the sample with the specimens. Order MAYO# 8835. Call MCS for pickup.

Units:
mL/24 h

Reference Interval:
Clearance: <= 27 mL/d

Synonyms:
• A1AT
• A1-AT
• Alpha-1-PI
- Alpha-1-Protease inhibitor
- A1-Antitrypsin
- A1-PI
- A1-Protease inhibitor

**Reported:**
Test performed Monday-F. Turnaround time: 3-4 days.

**CPT Codes:**
82103-90 x2.

**LOINC Codes:**
18271-7
Alpha-1-Antitrypsin, Phenotyping
ATPN

ORDERING

Available Stat:  No
Performing Lab:  Quest
Methodology:  Isoelectric focusing
Reported:  Test set up 5x per week, turnaround 5-7 days
Additional Information:  Most normal individuals have the M phenotype (M,M1, or M2). Over 99% of M phenotypes are genotypically MM. In the absence of family studies, the phenotype (M) and quantitative level can be used to infer the genotype MM.

The most common alleles associated with a quantitative deficiency are Z and S. The reports for the rare alleles will indicate whether or not they have been associated with reduced quantitative levels.

Synonyms:
- A1AT
- A1-AT
- Alpha-1-PI
- Alpha-1-Protease inhibitor
- A1-Antitrypsin
- A1-PI
- A1-Protease inhibitor

COLLECTION

Sample Type:  Serum
Collect:  Red top or Gold top
Amount to Collect:  2 mL blood
Preferred Volume:  1 mL serum
Minimum Volume:  0.1 mL serum
Stability (from collection to initiation):  Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month.

PROCESSING

Test Code:  ATPN
Test Group:  Alpha-1-Antitrypsin
Sendout:  Yes
Performing Lab:  Quest
Specimen Preparation:
Refrigerate. Order Quest Test # 853X Alpha-1-Antitrypsin Phenotyping

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20°C 1 month.

RESULT INTERPRETATION

Reference Interval:
90% of Normals are MM

Additional Information:
Most normal individuals have the M phenotype (M,M1, or M2). Over 99% of M phenotypes are genotypically MM. In the absence of family studies, the phenotype (M) and quantitative level can be used to infer the genotype MM.

The most common alleles associated with a quantitative deficiency are Z and S. The reports for the rare alleles will indicate whether or not they have been associated with reduced quantitative levels.

ADMINISTRATIVE

CPT Codes:
82104-90

LOINC Codes:
32769-2

COMPLETE VIEW

Available Stat:
No

Test Code:
ATPN

Test Group:
Alpha-1-Antitrypsin

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Isoelectric focusing

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Refrigerate. Order Quest Test # 853X Alpha-1-Antitrypsin Phenotyping

Reference Interval:
90% of Normals are MM
Synonyms:
- A1AT
- A1-AT
- Alpha-1-PI
- Alpha-1-Protease inhibitor
- A1-Antitrypsin
- A1-PI
- A1-Protease inhibitor

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month.

Reported:
Test set up 5x per week, turnaround 5-7 days

Additional Information:
Most normal individuals have the M phenotype (M,M1, or M2). Over 99% of M phenotypes are genotypically MM. In the absence of family studies, the phenotype (M) and quantitative level can be used to infer the genotype MM.

The most common alleles associated with a quantitative deficiency are Z and S. The reports for the rare alleles will indicate whether or not they have been associated with reduced quantitative levels.

CPT Codes:
82104-90

LOINC Codes:
32769-2
## Alpha-1-Antitrypsin, random stool

**A1AF**

### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Mayo</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>Rate nephelometry</td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
<td>7-10 days</td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
<td>The recommended test for protein losing enteropathy is, Alpha-1-antitrypsin, clearance.</td>
</tr>
</tbody>
</table>
| **Synonyms:** | • A1AT  
• A1-AT  
• Alpha-1-PI  
• Alpha-1-Protease inhibitor  
• A1-Antitrypsin  
• A1-PI  
• A1-Protease inhibitor |

### COLLECTION

<table>
<thead>
<tr>
<th><strong>Sample Type:</strong></th>
<th>Stool</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collect:</strong></td>
<td>Urine cup</td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
<td>10 g random stool</td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>10 g stool</td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
<td>5 g stool</td>
</tr>
</tbody>
</table>

### PROCESSING

<table>
<thead>
<tr>
<th><strong>Test Code:</strong></th>
<th>A1AF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Group:</strong></td>
<td>Alpha-1-Antitrypsin</td>
</tr>
<tr>
<td><strong>Sendout:</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Mayo</td>
</tr>
<tr>
<td><strong>Specimen Preparation:</strong></td>
<td>Refrigerate stool. Order MAYO# 182. Call MCS for pickup.</td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>10 g stool</td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
<td></td>
</tr>
</tbody>
</table>
5 g stool

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
<= 54 mg/dL
Additional Information:
The recommended test for protein losing enteropathy is, Alpha-1-antitrypsin, clearance.

ADMINISTRATIVE

CPT Codes:
82103-90

COMPLETE VIEW

Available Stat:
No
Test Code:
A1AF
Test Group:
Alpha-1-Antitrypsin
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
Rate nephelometry
Collect:
Urine cup
Amount to Collect:
10 g random stool
Sample Type:
Stool
Preferred Volume:
10 g stool
Minimum Volume:
5 g stool
Specimen Preparation:
Refrigerate stool. Order MAYO# 182. Call MCS for pickup.
Units:
mg/dL
Reference Interval:
<= 54 mg/dL
Synonyms:
• A1AT
• A1-AT
• Alpha-1-PI
• Alpha-1-Protease inhibitor
• A1-Antitrypsin
• A1-PI
A1-Protease inhibitor

**Reported:**

7-10 days

**Additional Information:**

The recommended test for protein losing enteropathy is, Alpha-1-antitrypsin, clearance.

**CPT Codes:**

82103-90
Alpha-1-Antitrypsin, serum
A1AT

ORDERING

Available Stat:
  No
Performing Lab:
  Immunology
Performed:
  Monday, Wednesday, Friday (day shift)
Methodology:
  Rate nephelometry
Reported:
  2-5 days
Additional Information:
  Lipemia interferes with the assay.
Synonyms:
  • A1AT
  • A1-AT
  • Alpha-1-PI
  • Alpha-1-Protease inhibitor
  • A1-Antitrypsin
  • A1-PI
  • A1-Protease inhibitor

COLLECTION

Sample Type:
  Serum
Collect:
  Gold top
Amount to Collect:
  1 mL blood
Preferred Volume:
  0.5 mL serum
Minimum Volume:
  0.3 mL serum
Unacceptable Conditions:
  Lipemic samples

PROCESSING

Test Code:
  A1AT
Test Group:
  Alpha-1-Antitrypsin
Performing Lab:
  Immunology
Specimen Preparation:
  Refrigerate
Preferred Volume:
0.5 mL serum

Minimum Volume:

0.3 mL serum

Unacceptable Conditions:

Lipemic samples

RESULT INTERPRETATION

Units:

mg/dL

Reference Interval:

79-207 mg/dL

Additional Information:

Lipemia interferes with the assay.

ADMINISTRATIVE

CPT Codes:

82103

LOINC Codes:

1825-9

COMPLETE VIEW

Available Stat:

No

Test Code:

A1AT

Test Group:

Alpha-1-Antitrypsin

Performing Lab:

Immunology

Performed:

Monday, Wednesday, Friday (day shift)

Methodology:

Rate nephelometry

Collect:

Gold top

Amount to Collect:

1 mL blood

Sample Type:

Serum

Preferred Volume:

0.5 mL serum

Minimum Volume:

0.3 mL serum

Unacceptable Conditions:

Lipemic samples

Specimen Preparation:

Refrigerate

Units:

mg/dL

Reference Interval:

79-207 mg/dL
Synonyms:
- A1AT
- A1-AT
- Alpha-1-PI
- Alpha-1-Protease inhibitor
- A1-Antitrypsin
- A1-PI
- A1-Protease inhibitor

Reported:
2-5 days

Additional Information:
Lipemia interferes with the assay.

CPT Codes:
82103

LOINC Codes:
1825-9
Alpha-Fetoprotein, CSF
AFPCSF

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
MEIA
Reported:
Test run Monday-Saturday. Turnaround time: 2-3 days.
Synonyms:
- AFP
- Alpha-fetoglobulin

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL CSF
Minimum Volume:
0.3 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code:
AFPCSF
Test Group:
Alpha-Fetoprotein
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Freeze specimen at -20C. Order MAYO# 8876 Ship on dry ice to China basin for MCI courier pick-up.
Preferred Volume:
1 mL CSF
Minimum Volume:
0.3 mL CSF

RESULT INTERPRETATION

Units:
ng/mL
**Reference Interval:**

<1.5 ng/mL

Reference range in newborns is not established.

---

**ADMINISTRATIVE**

**CPT Codes:**

- 86316-90

**LOINC Codes:**

- 1833-3

---

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- AFP

**Test Group:**

- Alpha-Fetoprotein

**Performing Lab:**

- Mayo

**Sendout:**

- Yes

**Methodology:**

- MEIA

**Remarks:**

Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Collect:**

- CSF tube or sterile collection tube

**Amount to Collect:**

- See preferred volume

**Sample Type:**

- CSF

**Preferred Volume:**

- 1 mL CSF

**Minimum Volume:**

- 0.3 mL CSF

**Specimen Preparation:**

Freeze specimen at -20°C. Order MAYO# 8876 Ship on dry ice to China basin for MCI courier pick-up.

**Units:**

- ng/mL

**Reference Interval:**

- <1.5 ng/mL

Reference range in newborns is not established.

**Synonyms:**

- AFP
- Alpha-fetoglobulin

**Reported:**

- Test run Monday-Saturday. Turnaround time: 2-3 days.

**CPT Codes:**

- 86316-90

**LOINC Codes:**

- 1833-3
Alpha-Fetoprotein, serum
AFPT

ORDERING

Performing Lab:
China Basin Chemistry

Performed:
Monday, Wednesday, Friday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1-5 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 2/20/18.

No significant impact on results.

The ARCHITECT AFP calibrators are manufactured gravimetrically and are referenced to the World Health Organization (WHO) First International Standard 72/225 for Alpha-fetoprotein at each concentration level.

Synonyms:
- AFP
- Alpha-fetoglobulin

COLLECTION

Sample Type:
Serum

Collect:
Preferred: Gold top or Red top
Acceptable: Dark Green or Light Green

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Room Temperature: 3 days
Refrigerated (2-8°C): 7 days

If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.

Avoid more than 5 freeze/thaw cycles.

Storage/Transport Temperature:
-20°C or colder

PROCESSING

Test Code:
AFPT

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Aliquot and freeze specimen at -20°C
Preferred Volume: 0.3 mL serum
Minimum Volume: 0.15 mL serum

Stability (from collection to initiation):
- Room Temperature: 3 days
- Refrigerated (2-8°C): 7 days

If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.

Avoid more than 5 freeze/thaw cycles.

Storage/Transport Temperature:
-20°C or colder

RESULT INTERPRETATION

Units: µg/L
Reference Interval:
- Adult Reference Range (>= 18 years): <8.9 ug/L
- Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 25 normal volunteers (18 years old) in the UCSF Laboratory.

Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Results (ug/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 1 month</td>
<td>&gt;2000</td>
</tr>
<tr>
<td>1 month - &lt; 3 months</td>
<td>10 - 1359</td>
</tr>
<tr>
<td>3 months - &lt; 6 months</td>
<td>4 - 275</td>
</tr>
<tr>
<td>6 months - &lt; 1 year</td>
<td>3 - 148</td>
</tr>
<tr>
<td>1 year - &lt; 3 years</td>
<td>3 - 21</td>
</tr>
<tr>
<td>3 years - &lt; 18 years</td>
<td>1 - 4</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Additional Information:
- No significant impact on results.
- The ARCHITECT AFP calibrators are manufactured gravimetrically and are referenced to the World Health Organization (WHO) First International Standard 72/225 for Alpha-fetoprotein at each concentration level.

ADMINISTRATIVE

CPT Codes: 82105
LOINC Codes: 1834-1

COMPLETE VIEW

Test Code: AFPT
Performing Lab: China Basin Chemistry
Performed:
    Monday, Wednesday, Friday (day shift)

Methodology:
    Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
    Preferred: Gold top or Red top
    Acceptable: Dark Green or Light Green

Amount to Collect:
    1 mL blood

Sample Type:
    Serum

Preferred Volume:
    0.3 mL serum

Minimum Volume:
    0.15 mL serum

Specimen Preparation:
    Aliquot and freeze specimen at -20°C

Units:
    µg/L

Reference Interval:
    Adult Reference Range (>= 18 years): <8.9 ug/L

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 25 normal volunteers (18 years old) in the UCSF Laboratory.

Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
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<td>3 years - &lt; 18 years</td>
<td>1 - 4</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Synonyms:
    - AFP
    - Alpha-fetoglobulin

Storage/Transport Temperature:
    -20°C or colder

Stability (from collection to initiation):
    Room Temperature: 3 days
    Refrigerated (2-8°C): 7 days

If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.

Avoid more than 5 freeze/thaw cycles.

Reported:
    1-5 days

Additional Information:
    Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 2/20/18.

No significant impact on results.

The ARCHITECT AFP calibrators are manufactured gravimetrically and are referenced to the World Health Organization (WHO) First International Standard 72/225 for Alpha-fetoprotein at each concentration level.
CPT Codes:
82105

LOINC Codes:
1834-1
**Alpha-Galactosidase Activity, Leukocytes**

**AGA**

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Mayo
- **Methodology:** Fluorometric

**COLLECTION**

- **Sample Type:** Citrated whole blood
- **Collect:** Yellow top (ACD)
- **Amount to Collect:** 7 mL blood
- **Preferred Volume:** 7 mL blood
- **Minimum Volume:** 5 mL blood
- **Remarks:** Specimen must arrive at Mayo Labs within 72 hours of draw to be stabilized. **Draw specimen Monday through Thursday only and NOT the day before a holiday.**
  - Transport sample immediately to lab for processing.
- **Stability (from collection to initiation):** Specimen must arrive within 72 hours of collection to Mayo.
- **Unacceptable Conditions:** Samples collected Friday or the day before a holiday.
- **Rejection Criteria:** Frozen sample received. Sample > 72 hours old on receipt.

**PROCESSING**

- **Test Code:** AGA
- **Sendout:** Yes
- **Performing Lab:** Mayo
- **Specimen Preparation:** Ship tubes refrigerated to China Basin for Mayo laboratory pickup. Order Mayo test #8785.
- **Preferred Volume:** 7 mL blood
- **Minimum Volume:** 5 mL blood
- **Unacceptable Conditions:** Samples collected Friday or the day before a holiday.
- **Rejection Criteria:** Frozen sample received. Sample > 72 hours old on receipt.
Stability (from collection to initiation):
Specimen must arrive within 72 hours of collection to Mayo.

RESULT INTERPRETATION

Units:
nmol/h/mg protein
Reference Interval:
>23 nmol/h/mg protein

ADMINISTRATIVE

CPT Codes:
82675-90

COMPLETE VIEW

Available Stat:
No
Test Code:
AGA
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
Fluorometric
Remarks:
Specimen must arrive at Mayo Labs within 72 hours of draw to be stabilized. Draw specimen Monday through Thursday only and NOT the day before a holiday.

Transport sample immediately to lab for processing.
Collect:
Yellow top (ACD)
Amount to Collect:
7 mL blood
Sample Type:
Citrated whole blood
Preferred Volume:
7 mL blood
Minimum Volume:
5 mL blood
Rejection Criteria:
Frozen sample received. Sample > 72 hours old on receipt.
Unacceptable Conditions:
Samples collected Friday or the day before a holiday.
Specimen Preparation:
Ship tubes refrigerated to China Basin for Mayo laboratory pickup. Order Mayo test #8785.
Units:
nmol/h/mg protein
Reference Interval:
>23 nmol/h/mg protein
Stability (from collection to initiation):
Specimen must arrive within 72 hours of collection to Mayo.
CPT Codes:
Alpha-globin Gene Sequencing
AGSQ

ORDERING

Ordering Recommendations:
This is not a first line test. It should only be ordered in patients clinically suspected of having Alpha thalassemia but where Alpha Thalassemia Deletion (ATHL) testing failed to identify a genetic lesion.

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed. Day shift only

Methodology:
PCR and DNA sequencing

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The most common types of mutations in alpha thalassemia are large deletions that encompass the alpha1, alpha2 or both alpha-globin genes (see Alpha Thalassemia mutations assay). If the common alpha globin deletions assay is negative and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. This assay will determine the DNA sequence of both alpha1 and alpha2 globin genes and detect the presence of point mutations that result in alpha thalassemia. This assay is also useful in uncovering the nature of hemoglobin alpha chain variants that may not be resolved by routine hemoglobin electrophoresis and/or HPLC.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Alpha thalasseia trait
- Hb H Disease
- HgbH disease
- Hgb H disease
- Hemoglobin H disease

COLLECTION

Sample Type:
- EDTA whole blood
- Amniotic fluid
- Cultured amniocytes or Chorionic villi

Collect:
- Lavender top
- Conical tube
- T25 cell culture flask

Amount to Collect:
- Blood: 5 mL
- Amniotic fluid: 20 mL
- Chorionic villi: 20 mg
- Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x2

Preferred Volume:
- Blood: 5 mL
- Amniotic fluid: 20 mL
Chorionic villi: 20 mg
?Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x2

Minimum Volume:

- Blood: 2 mL
- Amniotic fluid: 10 mL
- Chorionic villi: 10 mg
- ?Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x1

Unacceptable Conditions:

- Inadequate sample. Samples collected in heparin.

PROCESSING

Test Code:
AGSQ
Test Group:
Thalassemia
Performing Lab:
Medical Genomics - Molecular Diagnostics

Preferred Volume:

- Blood: 5 mL
- Amniotic fluid: 20 mL
- Chorionic villi: 20 mg
- ?Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x2

Minimum Volume:

- Blood: 2 mL
- Amniotic fluid: 10 mL
- Chorionic villi: 10 mg
- ?Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x1

Unacceptable Conditions:

- Inadequate sample. Samples collected in heparin.

RESULT INTERPRETATION

Reference Interval:
Negative: No mutations detected

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The most common types of mutations in alpha thalassemia are large deletions that encompass the alpha1, alpha2 or both alpha-globin genes (see Alpha Thalassemia mutations assay). If the common alpha globin deletions assay is negative and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. This assay will determine the DNA sequence of both alpha1 and alpha2 globin genes and detect the presence of point mutations that result in alpha thalassemia. This assay is also useful in uncovering the nature of hemoglobin alpha chain variants that may not be resolved by routine hemoglobin electrophoresis and/or HPLC.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
81405
LDT or Modified FDA:
Yes
LOINC Codes:
Available Stat:
No
Ordering Recommendations:
This is not a first line test. It should only be ordered in patients clinically suspected of having Alpha thalassemia but where Alpha Thalassemia Deletion (ATHL) testing failed to identify a genetic lesion.

Test Code:
AGSQ

Test Group:
Thalassemia

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed. Day shift only

Methodology:
PCR and DNA sequencing

Collect:
Lavender top
Conical tube
T25 cell culture flask

Amount to Collect:

Blood: 5 mL
Amniotic fluid: 20 mL
Chorionic villi: 20 mg
Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x2

Sample Type:
EDTA whole blood
Amniotic fluid
Cultured amniocytes or Chorionic villi

Preferred Volume:

Blood: 5 mL
Amniotic fluid: 20 mL
Chorionic villi: 20 mg
Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x2

Minimum Volume:

Blood: 2 mL
Amniotic fluid: 10 mL
Chorionic villi: 10 mg
Cultured cells (Amniotic fluid or CVS): Confluent T25 flasks x1

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Reference Interval:
Negative: No mutations detected

Synonyms:
- Alpha thalasseia trait
- Hb H Disease
- HgbH disease
- Hgb H disease
- Hemoglobin H disease

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The most common types of mutations in alpha thalassemia are large deletions that encompass the alpha1, alpha2 or both alpha-globin
genes (see Alpha Thalassemia mutations assay). If the common alpha globin deletions assay is negative and suspicion for alpha thalassemia remains elevated (e.g. low MCV, confounding presence of iron deficiency, low percentage of Hb S in sickle-cell trait, heterozygous beta thalassemia, Hb H disease with a two-alpha globin gene deletion), then it is possible that a non-deletion type of alpha thalassemia could be present. This assay will determine the DNA sequence of both alpha1 and alpha2 globin genes and detect the presence of point mutations that result in alpha thalassemia. This assay is also useful in uncovering the nature of hemoglobin alpha chain variants that may not be resolved by routine hemoglobin electrophoresis and/or HPLC.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
- 81405

LDT or Modified FDA:
- Yes

LOINC Codes:
- 21687-9
Aluminum, plasma
ALUM

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Atomic Spectroscopy
Reported: Test run 2x per week. Turnaround: 2-5 days.
Additional Information: µg/L x 0.0371 = µmol/L (SI units).

COLLECTION

Patient Preparation: Patient should refrain from taking antacids containing aluminum compounds at least three days prior to sample collection.
Sample Type: EDTA Plasma
Collect: Navy blue top (EDTA) tube
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL plasma
Minimum Volume: 0.7 mL plasma
Remarks: Avoid hemolysis. Collect one vacutainer and discard, collect second vacutainer and submit for testing.
Stability (from collection to initiation): Room temperature 4 days, refrigerated 2 weeks, frozen at -20C 1 month
Unacceptable Conditions: Hemolyzed samples

PROCESSING

Test Code: ALUM
Test Group: Aluminum
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Follow the detailed processing instructions for Trace Metal Analysis. Centrifuge within 2 hours of collection and pour the serum into the special red-labeled trace metal-free vial supplied by vendor. Store at room temperature Order Quest # 2958.
Preferred Volume: 2 mL plasma
Minimum Volume: 0.7 mL plasma
Unacceptable Conditions:

Hemolyzed samples

Stability (from collection to initiation):

Room temperature 4 days, refrigerated 2 weeks, frozen at -20°C 1 month

RESULT INTERPRETATION

Units:

µg/L (mcg/L)

Reference Interval:

Non-dialysis patient: <= 7 µg/L
Dialysis patient: < 40 µg/L

Additional Information:

µg/L x 0.0371 = µmol/L (SI units).

ADMINISTRATIVE

CPT Codes:

82108-90

LOINC Codes:

5574-9

COMPLETE VIEW

Available Stat:

No

Test Code:

ALUM

Test Group:

Aluminum

Performing Lab:

Quest

Sendout:

Yes

Methodology:

Atomic Spectroscopy

Patient Preparation:

Patient should refrain from taking antacids containing aluminum compounds at least three days prior to sample collection.

Remarks:

Avoid hemolysis. Collect one vacutainer and discard, collect second vacutainer and submit for testing.

Collect:

Navy blue top (EDTA) tube

Amount to Collect:

4 mL blood

Sample Type:

EDTA Plasma

Preferred Volume:

2 mL plasma

Minimum Volume:

0.7 mL plasma

Unacceptable Conditions:

Hemolyzed samples

Specimen Preparation:

Follow the detailed processing instructions for Trace Metal Analysis. Centrifuge within 2 hours of collection and pour the serum into the special red-labeled trace metal-free vial supplied by vendor. Store at room temperature Order Quest # 2958.
Units:
\[ \mu g/L \ (mcg/L) \]

Reference Interval:
- Non-dialysis patient: \( \leq 7 \mu g/L \)
- Dialysis patient: \( < 40 \mu g/L \)

Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 2 weeks, frozen at -20°C 1 month

Reported:
- Test run 2x per week. Turnaround: 2-5 days.

Additional Information:
- \( \mu g/L \times 0.0371 = \mu mol/L \) (SI units).

CPT Codes:
- 82108-90

LOINC Codes:
- 5574-9
Amikacin
AMIKP, AMIKT, AMIKRN

ORDERING

Available Stat:
No
Performing Lab:
UC Irvine
Methodology:
Enzyme-Multiple immunoassay Technique (EMIT)
Reported:
Test run daily. Turnaround time: 1-2 days.
Additional Information:
Concurrent kanamycin treatment interferes with assay. See the lab manual’s “A Guide on Drug Level Monitoring” (in the Chemistry Guide) for additional information.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL
Remarks:
Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing)
Trough samples should be collected 30 minutes before 3rd or 4th dose. Document exact time of collection in Apex, on requisition AND sample label.
Draw peak sample 30 min. after end of infusion or 60 minutes after IM dose.
Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 1 week, frozen 1 month.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
AMIKP (Peak), AMIKT (trough), AMIKRN (random)
Sendout:
Yes
Performing Lab:
UC Irvine
Specimen Preparation:
Freeze sample and ship frozen.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL
Unacceptable Conditions:
  Collected in Gold top

Stability (from collection to initiation):
  Room temperature 4 hours, refrigerated 1 week, frozen 1 month.

RESULT INTERPRETATION

Units:
  mg/L

Reference Interval:
  Peak: 20.0 - 30.0 µg/mL
  Trough: < 8.0 µg/mL

Critical Values:
  UC Irvine has critical values for Amikacin:

  Peak:
  < 12 months: > 30.0 µg/mL
  >= 12 months: > 35.0 µg/mL

  Trough:
  < 12 months: >= 10.0 µg/mL
  >= 12 months: >= 8.0 µg/mL

Additional Information:
  Concurrent kanamycin treatment interferes with assay. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
  80150-90

COMPLETE VIEW

Available Stat:
  No

Test Code:
  AMIKP (Peak), AMIKT (trough), AMIKRN (random)

Performing Lab:
  UC Irvine

Sendout:
  Yes

Methodology:
  Enzyme-Multiple immunoassay Technique (EMIT)

Remarks:
  Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing)

  Trough samples should be collected 30 minutes before 3rd or 4th dose. Document exact time of collection in Apex, on requisition AND sample label.

  Draw peak sample 30 min. after end of infusion or 60 minutes after IM dose.

Collect:
  Red top (Gold top NOT acceptable)

Amount to Collect:
  2 mL blood

Sample Type:
  Serum

Preferred Volume:
1 mL serum

**Minimum Volume:**
0.5 mL

**Unacceptable Conditions:**
Collected in Gold top

**Specimen Preparation:**
Freeze sample and ship frozen.

**Units:**
mg/L

**Reference Interval:**
Peak: 20.0 - 30.0 µg/mL
Trough: < 8.0 µg/mL

**Critical Values:**
UC Irvine has critical values for Amikacin:

Peak:
< 12 months: > 30.0 µg/mL
>= 12 months: > 35.0 µg/mL

Trough:
< 12 months: >= 10.0 µg/mL
>= 12 months: >= 8.0 µg/mL

**Stability (from collection to initiation):**
Room temperature 4 hours, refrigerated 1 week, frozen 1 month.

**Reported:**
Test run daily. Turnaround time: 1-2 days.

**Additional Information:**
Concurrent kanamycin treatment interferes with assay. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**CPT Codes:**
80150-90
Amino Acids, CSF, Quantitative
AACS F

ORDERING

Available Stat:
- No

Performing Lab:
- Lucille-Packard Children's Hospital

Methodology:
- Ion Exchange Chromatography

Reported:
- Batched twice weekly. Turnaround time: One week

Synonyms:
- Glycine
- Homocystine
- Tyrosine
- Alpha-keto acids
- Arginine
- Arginosuccinase deficiency
- Arginosuccinate Lyase deficiency
- Aspartate
- Aspartic acid
- Beta-aminosobutyric acid
- Citrulline
- Cystathionine
- Cystathionuria
- Ethanolamine
- FeCl3 Screen
- Ferric chloride screen
- Glutamic acid
- Histidine
- Isoleucine
- Leucine
- Lysine
- Methionine
- Ornithine
- Phosphoethanolamine
- Sarcosine
- Serine
- Taurine
- Threonine
- Valine
- Arginosuccinic acid
- Glutamine

Printed 06/07/19
Test information subject to change
### COLLECTION

**Sample Type:**
- CSF

**Collect:**
- CSF tube or sterile collection tube

**Amount to Collect:**
- See preferred volume

**Preferred Volume:**
- 1 mL CSF

**Minimum Volume:**
- 0.5 mL CSF

**Remarks:**
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

### PROCESSING

**Test Code:**
- AACSF

**Sendout:**
- Yes

**Performing Lab:**
- Lucille-Packard Children's Hospital

**Specimen Preparation:**
- Freeze CSF at -20°C

**Preferred Volume:**
- 1 mL CSF

**Minimum Volume:**
- 0.5 mL CSF

### ADMINISTRATIVE

**CPT Codes:**
- 82139-90

**LOINC Codes:**
- 32610-8

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- AACSF

**Performing Lab:**
- Lucille-Packard Children's Hospital

**Sendout:**
- Yes

**Methodology:**
- Ion Exchange Chromatography

**Remarks:**
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Collect:**
- CSF tube or sterile collection tube

**Amount to Collect:**
See preferred volume

**Sample Type:**
CSF

**Preferred Volume:**
1 mL CSF

**Minimum Volume:**
0.5 mL CSF

**Specimen Preparation:**
Freeze CSF at -20°C

**Synonyms:**
- Glycine
- Homocystine
- Tyrosine
- Alpha-keto acids
- Arginine
- Arginosuccinase deficiency
- Arginosuccinate Lyase deficiency
- Aspartate
- Aspartic acid
- Beta-aminoisobutyric acid
- Citrulline
- Cystathionine
- Cystathionuria
- Ethanolamine
- FeCl₃ Screen
- Ferric chloride screen
- Glutamic acid
- Histidine
- Isoleucine
- Leucine
- Lysine
- Methionine
- Ornithine
- Phosphoethanolamine
- Sarcosine
- Serine
- Taurine
- Threonine
- Valine
- Arginosuccinic acid
- Glutamine

**Reported:**
Batched twice weekly. Turnaround time: One week

**CPT Codes:**
82139-90

**LOINC Codes:**
32610-8
Amino Acids, Urine, Quantitative
AAQU

ORDERING

Available Stat:
No
Performing Lab:
Lucille-Packard Children's Hospital
Methodology:
Ion Exchange Chromatography
Reported:
Set up as needed, at least 2x a week. Turnaround time: One week.
Additional Information:
Urinary quantitation is rarely useful. Urine creatinine is also assayed.
Synonyms:
- Glycine
- Homocystine
- Tyrosine
- Alpha-keto acids
- Arginine
- Arginosuccinase deficiency
- Arginosuccinate Lyase deficiency
- Aspartate
- Aspartic acid
- Beta-aminoisobutyric acid
- Citrulline
- Cystathionine
- Cystathionuria
- Ethanolamine
- FeCl3 Screen
- Ferric chloride screen
- Glutamic acid
- Histidine
- Isoleucine
- Leucine
- Lysine
- Methionine
- Ornithine
- Phosphoethanolamine
- Sarcosine
- Serine
- Taurine
- Threonine
- Valine
- Arginosuccinic acid
• Glutamine

COLLECTION

Sample Type:
   Random urine

Collect:
   Urine cup

Amount to Collect:
   20 mL urine

Preferred Volume:
   5 mL urine

Minimum Volume:
   1 mL urine

Remarks:
   First morning urine preferred but not required.

PROCESSING

Test Code:
   AAQU

Test Group:
   Amino Acids

Sendout:
   Yes

Performing Lab:
   Lucille-Packard Children's Hospital

Specimen Preparation:
   Freeze at -20C.

Preferred Volume:
   5 mL urine

Minimum Volume:
   1 mL urine

RESULT INTERPRETATION

Reference Interval:
   See report

Additional Information:
   Urinary quantitation is rarely useful. Urine creatinine is also assayed.

ADMINISTRATIVE

CPT Codes:
   82139-90

LOINC Codes:
   35087-6

COMPLETE VIEW

Available Stat:
   No

Test Code:
   AAQU
Test Group: Amino Acids
Performing Lab: Lucille-Packard Children's Hospital
Sendout: Yes
Methodology: Ion Exchange Chromatography
Remarks: First morning urine preferred but not required.
Collect: Urine cup
Amount to Collect: 20 mL urine
Sample Type: Random urine
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Specimen Preparation: Freeze at -20°C.
Reference Interval: See report
Synonyms:
- Glycine
- Homocystine
- Tyrosine
- Alpha-keto acids
- Arginine
- Arginosuccinase deficiency
- Arginosuccinate Lyase deficiency
- Aspartate
- Aspartic acid
- Beta-aminoisobutyric acid
- Citrulline
- Cystathionine
- Cystathionuria
- Ethanolamine
- FeCl3 Screen
- Ferric chloride screen
- Glutaimic acid
- Histidine
- Isoleucine
- Leucine
- Lysine
- Methionine
- Ornithine
- Phosphoethanolamine
- Sarcosine
- Serine
- Taurine
- Threnonine
- Valine
- Arginosuccinic acid
- Glutamine

**Reported:**
Set up as needed, at least 2x a week. Turnaround time: One week.

**Additional Information:**
Urinary quantitation is rarely useful. Urine creatinine is also assayed.

**CPT Codes:**
82139-90

**LOINC Codes:**
35087-6
Aminolevulinic acid dehydratase, RBC

ALAD

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Enzymatic endpoint/Spectrofluorometric
Reported:
5-7 days
Synonyms:
• ALA dehydrase
• ALA-D

COLLECTION

Patient Preparation:
Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to collection.

Note: The patient should be off medications for 1 week. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.

Sample Type:
Heparinized whole blood
Collect:
Dark Green top on ice
Amount to Collect:
5 mL blood
Preferred Volume:
5 mL blood
Minimum Volume:
5 mL blood
Remarks:
Draw a full, Dark green-top (Sodium Heparin) tube, and send specimen on wet ice to lab immediately.

Draw specimen Monday-Thursday by noon only.

Stability (from collection to initiation):
Refrigerated whole blood 2 days.

Rejection Criteria:
Sample not received by Mayo within 48 hours of collection. Frozen sample.

PROCESSING

Test Code:
ALAD
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.
Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. **DO NOT** freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample REFRIGERATED to Mayo Labs.

Order Mayo test #88924.

**Preferred Volume:**
5 mL blood

**Minimum Volume:**
5 mL blood

**Rejection Criteria:**
Sample not received by Mayo within 48 hours of collection. Frozen sample.

**Stability (from collection to initiation):**
Refrigerated whole blood 2 days.

### RESULT INTERPRETATION

**Units:**
nmol/L/sec

**Reference Interval:**
- Normal: > 3.9 nmol/L/sec
- Indeterminate: 3.5-3.9 nmol/L/sec
- Decreased: < 3.5 nmol/L/sec

### ADMINISTRATIVE

**CPT Codes:**
82657-90

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
ALAD

**Performing Lab:**
Mayo

**Sendout:**
Yes

**Methodology:**
Enzymatic endpoint/Spectrofluorometric

**Patient Preparation:**
Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to collection.

Note: The patient should be off medications for 1 week. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.

**Remarks:**
Draw a full, Dark green-top (Sodium Heparin) tube, and send specimen on wet ice to lab immediately.

Draw specimen Monday-Thursday by noon only.

**Collect:**
Dark Green top on ice

**Amount to Collect:**
5 mL blood

**Sample Type:**
Heparinized whole blood
Preferred Volume:
5 mL blood

Minimum Volume:
5 mL blood

Rejection Criteria:
Sample not received by Mayo within 48 hours of collection. Frozen sample.

Specimen Preparation:
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.

Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. DO NOT freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample REFRIGERATED to Mayo Labs.

Order Mayo test #88924.

Units:
nmol/L/sec

Reference Interval:
Normal: > 3.9 nmol/L/sec
Indeterminate: 3.5-3.9 nmol/L/sec
Decreased: < 3.5 nmol/L/sec

Synonyms:
• ALA dehydrase
• ALA-D

Stability (from collection to initiation):
Refrigerated whole blood 2 days.

Reported:
5-7 days

CPT Codes:
82657-90
Amiodarone
AMIO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test performed Monday-Saturday. Turnaround time: 2-4 days.
Additional Information:
Includes assay for the metabolite N-desethylamiodarone.

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Remarks:
Do NOT use serum separator tube.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
AMIO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum at -20C. Order Quest # 43125N.
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Collected in Gold top

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
- Therapeutic for each: 1.5-2.5 mg/L
- Toxic Amiodarone: > 2.5 mg/L
- Desethyl-amiodarone: > 2.0 mg/L

Additional Information:
- Includes assay for the metabolite N-desethylamiodarone.

CPT Codes:
- 82492-90

LOINC Codes:
- 3330-8

Available Stat:
- No

Test Code:
- AMIO

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- HPLC

Remarks:
- Do NOT use serum separator tube.

Collect:
- Red top

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum

Preferred Volume:
- 2 mL serum

Minimum Volume:
- 1 mL serum

Unacceptable Conditions:
- Collected in Gold top

Specimen Preparation:
- Freeze serum at -20C. Order Quest # 43125N.

Units:
- mg/L

Reference Interval:
- Therapeutic for each: 1.5-2.5 mg/L
- Toxic Amiodarone: > 2.5 mg/L
- Desethyl-amiodarone: > 2.0 mg/L

Reported:
- Test performed Monday-Saturday. Turnaround time: 2-4 days.

Additional Information:
- Includes assay for the metabolite N-desethylamiodarone.

CPT Codes:
- 82492-90
LOINC Codes:
  3330-8
**Amitriptyline**

**AMTR**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Liquid Chromatography
Tandem Mass Spectrometry

**Reported:**
Test performed Monday-Saturday. Turnaround time: 2-5 days

**Additional Information:**
Includes testing for the metabolite nortriptyline (Aventyl)

**Synonyms:**
- Elavil
- Aventyl

### COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top

**Amount to Collect:**
6 mL blood

**Preferred Volume:**
3mL serum

**Minimum Volume:**
1.5 mL serum

**Remarks:**
Do NOT use serum separator tube.

**Unacceptable Conditions:**
Collected in Gold top

### PROCESSING

**Test Code:**
AMTR

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Separate serum promptly. Refrigerate.

**Preferred Volume:**
3mL serum

**Minimum Volume:**
1.5 mL serum

**Unacceptable Conditions:**
Collected in Gold top
RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
100-250 µg/L for sum of drug and metabolite

Critical Values:
Quest Priority-1: Amitriptyline + Nortriptyline >= 1000 µg/L
Quest Priority-2: 600-999 µg/L

Additional Information:
Includes testing for the metabolite nortriptyline (Aventyl)

ADMINISTRATIVE

CPT Codes:
80335-90

LOINC Codes:
3333-2

COMPLETE VIEW

Available Stat:
No

Test Code:
AMTR

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography
Tandem Mass Spectrometry

Remarks:
Do NOT use serum separator tube.

Collect:
Red top

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Separate serum promptly. Refrigerate.

Units:
µg/L (mcg/L)

Reference Interval:
100-250 µg/L for sum of drug and metabolite

Critical Values:
Quest Priority-1: Amitriptyline + Nortriptyline >= 1000 µg/L
Quest Priority-2: 600-999 µg/L
Synonyms:
- Elavil
- Aventyl

Reported:
Test performed Monday-Saturday. Turnaround time: 2-5 days

Additional Information:
Includes testing for the metabolite nortriptyline (Aventyl)

CPT Codes:
- 80335-90

LOINC Codes:
- 3333-2
Ammonia
NH3

ORDERING

Available Stat:
Yes (always run STAT)

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (glutamate dehydrogenase)

Reported:
1 hour

Additional Information:
Fasting sample recommended.

NOTE: Ammonia cannot be 'added-on' to a previously tested sample

Specimens should be sampled from free flowing blood without the use of tourniquets or heel/finger sticks. False positive elevations of ammonia can be caused by many factors including use of capillary samples or by delay between sampling and centrifugation (Clinical Biochemistry 40:531-535, 2007).


Synonyms:
- NH3

COLLECTION

Sample Type:
Heparinized plasma

Collect:
Light Green top (on ice)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.7 mL plasma

Remarks:
Fasting sample recommended. Pre-chill tube. Deliver to lab immediately on ice.

Specimens should be sampled from free flowing blood without the use of tourniquets or heel/finger sticks.

NOTE: Ammonia cannot be 'added-on' to a previously tested sample

Stability (from collection to initiation):
Sample should be transported to the lab on ice immediately after draw and the plasma separation from cells should be completed within less than 30 minutes of the blood draw. Once the plasma sample is obtained, it should be maintained on ice or refrigerated and analyzed immediately.

If the plasma cannot be analyzed immediately, it is stable on ice or in the refrigerator for 2 hours.

Stability information obtained from ARUP

Unacceptable Conditions:
Uncentrifuged blood samples that are > 30 minutes old or plasma samples that have not been tested or frozen within 2 hours of preparation.
If sample is NOT delivered on ice, immediately transport sample to the testing section and inform them the specimen was NOT received on ice.

PROCESSING

Test Code:
NH3
Performing Lab:
Parnassus & Mission Bay Chemistry
Specimen Preparation:
Sample should be transported to the lab on ice immediately after draw and the plasma separation from cells should be completed within less than 30 minutes of the blood draw. Once the plasma sample is obtained, it should be maintained on ice or refrigerated and analyzed immediately.

If the plasma cannot be analyzed immediately, it is stable on ice or in the refrigerator for 2 hours.

Stability information obtained from ARUP

If the test is ordered routine or at Mt. Zion, collect the specimen and centrifuge within 30 minutes. Aliquot and freeze the plasma at -20°C immediately and send to Moffitt/Long on next scheduled delivery run.

Preferred Volume:
1 mL plasma
Minimum Volume:
0.7 mL plasma
Unacceptable Conditions:
Uncentrifuged blood samples that are > 30 minutes old or plasma samples that have not been tested or frozen within 2 hours of preparation.

If sample is NOT delivered on ice, immediately transport sample to the testing section and inform them the specimen was NOT received on ice.

Stability (from collection to initiation):
Sample should be transported to the lab on ice immediately after draw and the plasma separation from cells should be completed within less than 30 minutes of the blood draw. Once the plasma sample is obtained, it should be maintained on ice or refrigerated and analyzed immediately.

If the plasma cannot be analyzed immediately, it is stable on ice or in the refrigerator for 2 hours.

Stability information obtained from ARUP

RESULT INTERPRETATION

Units:
µmol/L
Reference Interval:
<30 days: < 50 µmol/L
>= 30 days: < 35 µmol/L

Note: Reference ranges determined by validating the assay manufacturer's reference range in 24 adult laboratory staff and by adapting the newborn reference range from method number 2 in Soldin et al. Pediatric Reference Intervals, 6th edition, 2007

Critical Values:
>150 µmol/L for patients less than 18 years of age

Additional Information:
Fasting sample recommended.

NOTE: Ammonia cannot be 'added-on' to a previously tested sample

Specimens should be sampled from free flowing blood without the use of tourniquets or heel/finger sticks. False positive elevations of ammonia can be caused by many factors including use of capillary samples or by delay between sampling and centrifugation (Clinical Biochemistry 40:531-535, 2007).

**ADMINISTRATIVE**

**CPT Codes:**
- 82140

**LOINC Codes:**
- 22763-7

**COMPLETE VIEW**

**Available Stat:**
- Yes (always run STAT)

**Test Code:**
- NH3

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Spectrophotometric, kinetic (glutamate dehydrogenase)

**Remarks:**
- Fasting sample recommended. Pre-chill tube. Deliver to lab immediately on ice.
- Specimens should be sampled from free flowing blood without the use of tourniquets or heel/finger sticks.
- NOTE: Ammonia cannot be ‘added-on’ to a previously tested sample

**Collect:**
- Light Green top (on ice)

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Heparinized plasma

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.7 mL plasma

**Unacceptable Conditions:**
- Uncentrifuged blood samples that are > 30 minutes old or plasma samples that have not been tested or frozen within 2 hours of preparation.

- If sample is NOT delivered on ice, immediately transport sample to the testing section and inform them the specimen was NOT received on ice.

**Specimen Preparation:**
- Sample should be transported to the lab on ice immediately after draw and the plasma separation from cells should be completed within less than 30 minutes of the blood draw. Once the plasma sample is obtained, it should be maintained on ice or refrigerated and analyzed immediately.

- If the plasma cannot be analyzed immediately, it is stable on ice or in the refrigerator for 2 hours.

- Stability information obtained from ARUP

- If the test is ordered routine or at Mt. Zion, collect the specimen and centrifuge within 30 minutes. Aliquot and freeze the plasma at -20°C immediately and send to Moffitt/Long on next scheduled delivery run.

**Units:**
- µmol/L
Reference Interval:
- <30 days: < 50 µmol/L
- ≥ 30 days: < 35 µmol/L

Note: Reference ranges determined by validating the assay manufacturer's reference range in 24 adult laboratory staff and by adapting the newborn reference range from method number 2 in Soldin et al. Pediatric Reference Intervals, 6th edition, 2007

Critical Values:
- >150 µmol/L for patients less than 18 years of age

Synonyms:
- NH3

Stability (from collection to initiation):
- Sample should be transported to the lab on ice immediately after draw and the plasma separation from cells should be completed within less than 30 minutes of the blood draw. Once the plasma sample is obtained, it should be maintained on ice or refrigerated and analyzed immediately.

If the plasma cannot be analyzed immediately, it is stable on ice or in the refrigerator for 2 hours.

Stability information obtained from ARUP

Reported:
- 1 hour

Additional Information:
- Fasting sample recommended.

NOTE: Ammonia cannot be 'added-on' to a previously tested sample

Specimens should be sampled from free flowing blood without the use of tourniquets or heel/finger sticks. False positive elevations of ammonia can be caused by many factors including use of capillary samples or by delay between sampling and centrifugation (Clinical Biochemistry 40:531-535, 2007).


CPT Codes:
- 82140

LOINC Codes:
- 22763-7
Amphetamine Screen, Urine
AMPU

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling
Reported:
STAT 2 hours, Routine 4 hours
Additional Information:
A concentration of < 1000 µg/L is considered negative by this test. A positive result is >= 1000 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects amphetamine and methamphetamine and has some cross reactivity with MDA (methylenedioxymethamphetamine; ecstasy).

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code AMPQNT.

Samples are held for 7 days. False negative results are also possible, for example, with use of newer designer amine compounds.

Amphetamine can be detected in urine from 24 hours up to 9 days after use. Methamphetamine can typically be detected 1.5-6 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205).

COLLECTION

Sample Type: Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20ºC 2 weeks

PROCESSING

Test Code:
AMPU
Test Group:
Amphetamine
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20°C 2 weeks

RESULT INTERPRETATION

Reference Interval:
Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 1000 µg/L.

Additional Information:
A concentration of < 1000 µg/L is considered negative by this test. A positive result is >= 1000 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects amphetamine and methamphetamine and has some cross reactivity with MDA (methylenedioxyamphetamine) and MDMA (methylenedioxymethamphetamine; ecstasy).

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False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code AMPQNT. Samples are held for 7 days. False negative results are also possible, for example, with use of newer designer amine compounds.

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ADMINISTRATIVE

CPT Codes:
80301

LOINC Codes:
19343-3

COMPLETE VIEW

Available Stat:
Yes

Test Code:
AMPU

Test Group:
Amphetamine

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling

Collect:
Urine cup

Amount to Collect:
See preferred volume
Sample Type:
Random urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Reference Interval:
Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 1000 µg/L.

Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20°C 2 weeks

Reported:
STAT 2 hours, Routine 4 hours

Additional Information:
A concentration of < 1000 µg/L is considered negative by this test. A positive result is >= 1000 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects amphetamine and methamphetamine and has some cross reactivity with MDA (methylenedioxyamphetamine) and MDMA (methylenedioxymethamphetamine; ecstasy).

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False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code AMPQNT. Samples are held for 7 days. False negative results are also possible, for example, with use of newer designer amine compounds.

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CPT Codes:
80301

LOINC Codes:
19343-3
Amphetamines, Urine, Quantitative
AMQNT

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Amphetamines Urine Screen with Reflex to Quantitation (2012209) is preferred.

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- Adderall
- Amphetamine
- Benzedrine
- Carbex
- Deprenyl
- Desoxyn
- Dexedrine
- Dextroamphetamine
- Ecstasy
- Eldepryl
- Emsam
- Eve
- Lisdexamfetamine
- MDA
- MDEA
- MDMA
- MDMA Confirmation, Urine
- Methamphetamine
- Methedrine
- Pain Management
- Pain Management, Amphetamines, Quantitative, with medMATCH, Urine
- Pain Management, Amphetamines, with Confirmation with medMATCH, Urine
- Pain Management, MDMA/MDA Quantitative, Urine
- Pain Management, MDMA/MDA, Quantitative, with medMATCH, Urine
- Paremyd
- Selegiline
- Vicks Inhaler
- Vyvanse
- XTC
- Zelapor
COLLECTION

Collect:
Random urine.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
AMQNT

ARUP Test Code:
2010075

Specimen Preparation:
Transfer 0.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature

RESULT INTERPRETATION

Reference Interval:
Effective November 11, 2018

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
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<tbody>
<tr>
<td>Amphetamine</td>
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</tr>
<tr>
<td>Methamphetamine</td>
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</tr>
<tr>
<td>Methylenedioxyamphetamine (MDA)</td>
<td>200 ng/mL</td>
</tr>
<tr>
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<td>200 ng/mL</td>
</tr>
<tr>
<td>Methylenedioxyethylamphetamine (Eve, MDEA)</td>
<td>200 ng/mL</td>
</tr>
<tr>
<td>Phentermine</td>
<td>200 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:

Positive cutoff: 200 ng/mL unless specified below:
Amphetamine 50 ng/mL

For medical purposes only; not valid for forensic use.

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:
80325; 80359 (Alt code: G0480)

LOINC:
Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Amphetamines Urine Screen with Reflex to Quantitation (2012209) is preferred.

Test Code:
AMPQNT
ARUP Test Code:
2010075
Performed:
Sun-Sat
Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Collect:
Random urine.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Transfer 0.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Reference Interval:
Effective November 11, 2018

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Interpretive Data:

Positive cutoff: 200 ng/mL unless specified below:
Amphetamine 50 ng/mL

For medical purposes only; not valid for forensic use.

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

Synonyms:
- Adderall
- Amphetamine
- Benzedrine
- Carbx
- Deprenyl
- Desoxyephedrine
- Desoxyn
- Dexedrine
- Dextroamphetamine
- Ecstasy
- Eldepryl
- Emsam
- Eve
- Lisdexamfetamine
- MDA
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- MDMA Confirmation, Urine
- Methamphetamine
- Methedrine
- Pain Management
- Pain Management, Amphetamines, Quantitative, with medMATCH, Urine
- Pain Management, Amphetamines, with Confirmation with medMATCH, Urine
- Pain Management, MDMA/MDA Quantitative, Urine
- Pain Management, MDMA/MDA, Quantitative, with medMATCH, Urine
- Paremyd
- Selegiline
- Vicks Inhaler
- Vyvanse
- XTC
- Zelapor

**Storage/Transport Temperature:**
Room temperature

**Stability (from collection to initiation):**
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Reported:**
1-4 days

**CPT Codes:**
80325; 80359 (Alt code: G0480)

**LOINC:**
- 19346-6
- 3780-4
- 18355-8
- 19570-1
- 27085-0

Printed 06/07/19
Test information subject to change
**Amylase, Body Fluid**

**AMYB**

### ORDERING

**Ordering Recommendations:**
Not a routinely available test. See 'Additional information'

**Available Stat:**
Yes

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Spectrophotometric, enzymatic rate

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**Synonyms:**
- Diastase

### COLLECTION

**Sample Type:**
Body Fluid

**Collect:**
Red top or clean container

**Amount to Collect:**
5 mL fluid

**Preferred Volume:**
0.5 mL fluid

**Minimum Volume:**
0.2 mL fluid

**Remarks:**
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days.

### PROCESSING

**Test Code:**
AMYB

**Test Group:**
Amylase

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Preferred Volume:**
0.5 mL fluid
Minimum Volume:
0.2 mL fluid

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days.

RESULT INTERPRETATION

Units:
U/L

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

ADMINISTRATIVE

CPT Codes:
82150

LOINC Codes:
1795-4

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
AMYB

Test Group:
Amylase

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, enzymatic rate

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body Fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Units:
U/L

Synonyms:
Diastase

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days.

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**
82150

**LOINC Codes:**
1795-4
Amylase, Plasma / Serum

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric, enzymatic rate
Reported: STAT 1 hour, Routine 4 hours
Additional Information: Note that this assay reacts with both pancreatic and salivary amylase.


Synonyms: Diastase

COLLECTION

Sample Type: Plasma or serum
Collect: Light green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days.

PROCESSING

Test Code: AMY
Test Group: Amylase
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days.

RESULT INTERPRETATION
Units:

U/L

Reference Interval:

- 0 - 5 months: 5 - 65 U/L
- 6 months - 2 years: 12 - 113 U/L
- 3 years - 5 years: 26 - 163 U/L
- 6 years - 11 years: 27 - 113 U/L
- 12 years - 17 years: 30 - 126 U/L
- >=18 years: 23 - 144 U/L


Additional Information:

Note that this assay reacts with both pancreatic and salivary amylase.


ADMINISTRATIVE

CPT Codes:

82150

LOINC Codes:

1798-8

COMPLETE VIEW

Available Stat:

Yes

Test Code:

AMY

Test Group:

Amylase

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Spectrophotometric, enzymatic rate

Collect:

Light green top preferred, Gold top acceptable

Amount to Collect:

1 mL blood

Sample Type:

Plasma or serum

Preferred Volume:

0.5 mL plasma or serum

Minimum Volume:

0.2 mL plasma or serum

Units:

U/L

Reference Interval:

0 - 5 months: 5 - 65 U/L
6 months - 2 years  12 - 113 U/L  
3 years - 5 years    26 - 163 U/L  
6 years - 11 years  27 - 113 U/L  
12 years - 17 years 30 - 126 U/L  
>=18 years        23 - 144 U/L


**Synonyms:**
- Diastase

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days.

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- Note that this assay reacts with both pancreatic and salivary amylase.


**CPT Codes:**
- 82150

**LOINC Codes:**
- 1798-8
Amylase, random urine

ORDERING

Available Stat:  Yes
Performing Lab:  Parnassus & Mission Bay Chemistry
Performed:  Test available 24 hours per day 7 days per week
Methodology:  Spectrophotometric, enzymatic rate
Reported:  STAT 1 hour, Routine same or next day
Synonyms:  • Diastase

COLLECTION

Sample Type:  Random urine
Collect:  Urine cup
Amount to Collect:  10 mL urine
Preferred Volume:  1 mL urine
Minimum Volume:  0.5 mL urine
Stability (from collection to initiation):  Refrigerated 2 days

PROCESSING

Test Code:  AMYUR
Test Group:  Amylase
Performing Lab:  Parnassus & Mission Bay Chemistry
Preferred Volume:  1 mL urine
Minimum Volume:  0.5 mL urine
Stability (from collection to initiation):  Refrigerated 2 days

RESULT INTERPRETATION

Units:  U/L
Reference Interval:  

Printed 06/07/19
Test information subject to change
ADMINISTRATIVE

CPT Codes:
- 82150

LOINC Codes:
- 1799-6

COMPLETE VIEW

Available Stat:
Yes

Test Code:
AMYUR

Test Group:
Amylase

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, enzymatic rate

Collect:
Urine cup

Amount to Collect:
10 mL urine

Sample Type:
Random urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Units:
U/L

Reference Interval:
<650 U/L

Synonyms:
- Diastase

Stability (from collection to initiation):
Refrigerated 2 days

Reported:
STAT 1 hour, Routine same or next day

CPT Codes:
82150

LOINC Codes:
1799-6
Amylase, timed (2 hour) urine
AMYU

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.
Methodology:
Spectrophotometric, enzymatic rate
Reported:
STAT 1 hour, Routine same or next day
Additional Information:
Synonyms:
• Diastase

COLLECTION

Sample Type:
Timed urine collection (2 hour)
Collect:
24 hour urine collection container
Amount to Collect:
Complete collection
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Remarks:
Two hour collection recommended
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
AMYU
Test Group:
Amylase
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION
Units:
  U/hour

Reference Interval:
  1-17 U/hour

Additional Information:

ADMINISTRATIVE

CPT Codes:
  82150

COMPLETE VIEW

Available Stat:
  Yes

Test Code:
  AMYU

Test Group:
  Amylase

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
  Spectrophotometric, enzymatic rate

Remarks:
  Two hour collection recommended

Collect:
  24 hour urine collection container

Amount to Collect:
  Complete collection

Sample Type:
  Timed urine collection (2 hour)

Preferred Volume:
  1 mL urine

Minimum Volume:
  0.5 mL urine

Units:
  U/hour

Reference Interval:
  1-17 U/hour

Synonyms:
  • Diastase

Stability (from collection to initiation):
  Refrigerated 2 days

Reported:
  STAT 1 hour, Routine same or next day

Additional Information:

CPT Codes:
  82150
Anaplasma phagocytophilium, Antibodies (IgG & IgM)

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Immunofluorescent assay
Reported: Set up 6x per week, turnaround 4-5 days.
Synonyms:
- Ehrlichia phagocytophilia
- Ehrlichia equi
- Human granulocytic ehrlichiosis
- Human granulocytic anaplasmosis
- HGE
- HGA

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top NOT acceptable)
Amount to Collect: 3 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Remarks: If B/T patient, requires prior authorization for outside testing at Quest, no longer offered at LabCorp.
Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.
Unacceptable Conditions:
- Collected in Gold top

PROCESSING

Test Code: ANAPL
Test Group: Ehrlichia
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
- Freeze serum. Order Quest test # 83386N.
If B/T patient, requires prior authorization for outside testing at Quest, no longer offered at LabCorp.

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Unacceptable Conditions:**
- Collected in Gold top

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.

### RESULT INTERPRETATION

**Units:**
- titer

**Reference Interval:**
- IgG: < 1:64 titer
- IgM: < 1:20 titer

### ADMINISTRATIVE

**CPT Codes:**
- 86666-90 x2

**LOINC Codes:**
- 30338-8

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- ANAPL

**Test Group:**
- Ehrlichia

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Immunoflourescent assay

**Remarks:**
- If B/T patient, requires prior authorization for outside testing at Quest, no longer offered at LabCorp.

**Collect:**
- Red top (Gold top NOT acceptable)

**Amount to Collect:**
- 3 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Unacceptable Conditions:**
- Collected in Gold top

**Specimen Preparation:**
Freeze serum. Order Quest test # 83386N.

If B/T patient, requires prior authorization for outside testing at Quest, no longer offered at LabCorp.

**Units:**
- titer

**Reference Interval:**
- IgG: < 1:64 titer
- IgM: < 1:20 titer

**Synonyms:**
- Ehrlichia phagocytophilia
- Ehrlichia equi
- Human granulocytic ehrlichiosis
- Human granulocytic anaplasmosis
- HGE
- HGA

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.

**Reported:**
- Set up 6x per week, turnaround 4-5 days.

**CPT Codes:**
- 86666-90 x2

**LOINC Codes:**
- 30338-8
Androstanediol Glucuronide, 3 alpha-AGLU

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Enzyme digestion, chromatography, RIA
Reported: Test run Monday and Thursday. Turnaround time: 4-7 days.
Additional Information:
3α-Androstanediol Glucuronide is useful in evaluating idiopathic hirsutism in women, especially when the total testosterone concentrations are not elevated.

COLLECTION

Sample Type: Serum
Collect: Gold top, Red top
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL serum
Minimum Volume: 0.3 mL serum

PROCESSING

Test Code: AGLU
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest test # 5276X.
Preferred Volume: 2 mL serum
Minimum Volume: 0.3 mL serum

RESULT INTERPRETATION

Units: ng/dL
Reference Interval:
Prepubertal 10-60 ng/dL

Tanner Stages II-III:
Males 19-164 ng/mL
Females 33-244 ng/dL

>= 18 year olds:
Males 260-1500 ng/dL
Females 60-300 ng/dL

Additional Information:
3a-Androstane diol Glucuronide is useful in evaluating idiopathic hirsutism in women, especially when the total testosterone concentrations are not elevated.

ADMINISTRATIVE

CPT Codes:
82154-90

LOINC Codes:
1680-8

COMPLETE VIEW

Available Stat:
No

Test Code:
AGLU

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Enzyme digestion, chromatography, RIA

Collect:
Gold top, Red top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Refrigerate. Order Quest test # 5276X.

Units:
ng/dL

Reference Interval:
Prepubertal 10-60 ng/dL

Tanner Stages II-III:
Males 19-164 ng/mL
Females 33-244 ng/dL

>= 18 year olds:
Males 260-1500 ng/dL
Females 60-300 ng/dL
Reported:
  Test run Monday and Thursday. Turnaround time: 4-7 days.

Additional Information:
  3a-Androstanediol Glucuronide is useful in evaluating idiopathic hirsutism in women, especially when the total testosterone concentrations are not elevated.

CPT Codes:
  82154-90

LOINC Codes:
  1680-8
Androstenedione
ASDN

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Test performed Tuesday-Saturday. Turnaround time: 2-4 days.
Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0349. Newborn reference ranges are taken from Tietz, NW, Clinical Guide to Laboratory Tests, 2nd ed., 1990, Saunders, Philadelphia.

COLLECTION

Patient Preparation:
Early AM sample preferred
Sample Type:
Serum or plasma
Collect:
Red top preferred (Gold top NOT acceptable), EDTA, Light Green and Dark Green acceptable
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum plasma
Minimum Volume:
0.25 mL serum or plasma
Remarks:
Early AM sample preferred
Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen at -20C 2 years
Unacceptable Conditions:
Sample collected in Gold top

PROCESSING

Test Code:
ASDN
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 17182.
Preferred Volume:
1 mL serum plasma
Minimum Volume:
0.25 mL serum or plasma
Unacceptable Conditions:
Sample collected in Gold top
Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen at -20C 2 years

RESULT INTERPRETATION

Units:
ng/dL

Reference Interval:
Pediatric:
1-12 months 6-78 ng/dL
1-4 years 5-51 ng/dL
5-9 years 6-115 ng/dL
10-13 years 12-221 ng/dL
14-17 years 22-225 ng/dL

Premature infants (31-35 weeks) <= 480 ng/dL
Term infants <= 290 ng/dL

Tanner Stages:
II-III Males 17-82 ng/dL
II-III Females 43-180 ng/dL
IV-V Males 57-150 ng/dL
IV-V Females 7-68 ng/dL

>= 18 year old male:
18-30 years 50-220 ng/dL
31-50 years 40-190 ng/dL
51-60 years 50-220 ng/dL

>= 18 year old female:
Follicular 35-250 ng/dL
Mid-cycle 60-285 ng/dL
Luteal 30-235 ng/dL
Postmenopausal 20-75 ng/dL

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0349. Newborn reference ranges are taken from Tietz, NW, Clinical Guide to Laboratory Tests, 2nd ed., 1990, Saunders, Philadelphia.

ADMINISTRATIVE

CPT Codes:
82157-90
LOINC Codes:
1854-9

COMPLETE VIEW

Available Stat:
No
Test Code:
ASDN
Performing Lab:
Quest
Sendout:
Yes
Methodology:
LC/MS/MS

Patient Preparation:
Early AM sample preferred

Remarks:
Early AM sample preferred

Collect:
Red top preferred (Gold top NOT acceptable), EDTA, Light Green and Dark Green acceptable

Amount to Collect:
2 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
1 mL serum plasma

Minimum Volume:
0.25 mL serum or plasma

Unacceptable Conditions:
Sample collected in Gold top

Specimen Preparation:
Refrigerate. Order Quest # 17182.

Units:
ng/dL

Reference Interval:

Pediatric:
1-12 months 6-78 ng/dL
1-4 years  5-51 ng/dL
5-9 years  6-115 ng/dL
10-13 years 12-221 ng/dL
14-17 years 22-225 ng/dL

Premature infants (31-35 weeks) <= 480 ng/dL
Term infants             <= 290 ng/dL

Tanner Stages:
II-III Males 17-82 ng/dL
II-III Females 43-180 ng/dL
IV-V Males   57-150 ng/dL
IV-V Females 7-68 ng/dL

>= 18 year old male:
18-30 years 50-220 ng/dL
31-50 years 40-190 ng/dL
51-60 years 50-220 ng/dL

>= 18 year old female:
Follicular    35-250 ng/dL
Mid-cycle     60-285 ng/dL
Luteal        30-235 ng/dL
Postmenopausal 20-75 ng/dL

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen at -20C 2 years

Reported:
Test performed Tuesday-Saturday. Turnaround time: 2-4 days.

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0349. Newborn reference ranges are taken from Tietz, NW, Clinical Guide to Laboratory Tests, 2nd ed., 1990, Saunders, Philadelphia.
CPT Codes:
  82157-90
LOINC Codes:
  1854-9
Aneuvysion FISH
CYFD, BCYFD

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily, Monday-Friday

Methodology:
Fluorescent in-situ hybridization

Reported:
7-14 days

Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. A normal result indicates that no numeric abnormality of chromosomes 13, 18, 21, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

“Direct FISH” is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For Direct FISH analysis, 50 cells are examined for each probe.

Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA ‘88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:
- Cytogenetic analysis
- Karyotype
- Karyotyping
- CYFD
- BCYFD

COLLECTION

Sample Type:
Heparinized whole blood, CVS, Amniotic fluid, POC

Collect:
Blood: Dark green top
Amniotic fluid: Sterile screw top container
CVS or POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.

Amount to Collect:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic fluid: 10 mL
CVS: 10 mg
?POC: 10 mg

Preferred Volume:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic fluid: 10 mL
CVS: 10 mg
?POC: 10 mg

Minimum Volume:
Whole blood, child or adult: 3 mL
Whole blood, infant: 1 mL
Amniotic fluid: 5 mL
CVS: 5 mg
?POC: 5 mg

Remarks:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
BCYFD: Blood
CYFD: Bone marrow

Test Group:
Chromosome Analysis

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Preferred Volume:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic fluid: 10 mL
CVS: 10 mg
?POC: 10 mg

Minimum Volume:
Whole blood, child or adult: 3 mL
Whole blood, infant: 1 mL
Amniotic fluid: 5 mL
CVS: 5 mg
?POC: 5 mg

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
48 hours

RESULT INTERPRETATION

Reference Interval:
Normal. See Additional Information

Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. A normal result indicates that no numeric abnormality of chromosomes 13, 18, 21, X and Y were
identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

**DIRECT FISH results are preliminary:** G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

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Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

### ADMINISTRATIVE

**CPT Codes:**
- 88275, 88271x3

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 50684-0

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- BCYFD: Blood
- CYFD: Bone marrow

**Test Group:**
- Chromosome Analysis

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily, Monday-Friday

**Methodology:**
- Fluorescent in-situ hybridization

**Remarks:**
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

**Collect:**
- Blood: Dark green top
- Amniotic fluid: Sterile screw top container
- CVS or POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.

**Amount to Collect:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- ?POC: 10 mg

**Sample Type:**
- Heparinized whole blood, CVS, Amniotic fluid, POC

**Preferred Volume:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
CVS: 10 mg
?POC: 10 mg

Minimum Volume:
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- ?POC: 5 mg

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Reference Interval:
- Normal. See Additional Information

Synonyms:
- Cytogenetic analysis
- Karyotype
- Karyotyping
- CYFD
- BCYFD

Stability (from collection to initiation):
- 48 hours

Reported:
- 7-14 days

Reflex Testing:
- If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional Information:
- Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. A normal result indicates that no numeric abnormality of chromosomes 13, 18, 21, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For Direct FISH analysis, 50 cells are examined for each probe.

Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

CPT Codes:
- 88275, 88271x3

LDT or Modified FDA:
- Yes

LOINC Codes:
- 50684-0
Aneuvysion FISH 13/21
A1321, BA1321

ORDERING

Available Stat:
No
Performing Lab:
Medical genomics - Cytogenetics
Performed:
Set up daily, Monday - Friday
Methodology:
Fluorescent in-situ hybridization (FISH)
Reported:
2-3 days
Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

“Direct FISH” is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY, The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.

Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.
Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.
Synonyms:
- AV 18/XY
- Direct aneuploidy FISH 18/XY
- A1321
- BA1321

COLLECTION

Sample Type:
Heparinized whole blood, Amniotic fluid, CVS, POC
Collect:
Blood: Dark green top
Amniotic fluid: Sterile screw top container
CVS or POC: 15 mL centrifuge tube with transport media (Available from Cytogenetics: 353-4844)
Amount to Collect:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic fluid: 10 mL
CVS: 10 mg
POC: 10 mg

Preferred Volume:
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- ?POC: 10 mg

Minimum Volume:
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- ?POC: 5 mg

Stability (from collection to initiation):
- 1-2 days

PROCESSING

Test Code:
- BA1321: Blood
- A1321: Bone marrow

Test Group:
- FISH

Performing Lab:
- Medical genomics - Cytogenetics

Specimen Preparation:
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Preferred Volume:
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- ?POC: 10 mg

Minimum Volume:
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- ?POC: 5 mg

Stability (from collection to initiation):
- 1-2 days

RESULT INTERPRETATION

Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY. The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.
Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275, 88291

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BA1321: Blood
  - A1321: Bone marrow

**Test Group:**
- FISH

**Performing Lab:**
- Medical genomics - Cytogenetics

**Performed:**
- Set up daily, Monday - Friday

**Methodology:**
- Fluorescent in-situ hybridization (FISH)

**Collect:**
- Blood: Dark green top
- Amniotic fluid: Sterile screw top container
- CVS or POC: 15 mL centrifuge tube with transport media (Available from Cytogenetics: 353-4844)

**Amount to Collect:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

**Sample Type:**
- Heparinized whole blood, Amniotic fluid, CVS, POC

**Preferred Volume:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

**Minimum Volume:**
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- POC: 5 mg

**Specimen Preparation:**
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

**Synonyms:**
- AV 18/XY
- Direct aneuploidy FISH 18/XY
- A1321
Stability (from collection to initiation):
1-2 days

Reported:
2-3 days

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY, The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.

Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

CPT Codes:
88271 x2, 88275, 88291

LDT or Modified FDA:
Yes
**Aneuvysion FISH 18/XY**
A18XY, BÀ18XY

### ORDERING

**Available Stat:**  
No

**Performing Lab:**  
Medical genomics - Cytogenetics

**Performed:**  
Set up daily, Monday - Friday

**Methodology:**  
Fluorescent in-situ hybridization (FISH)

**Reported:**  
2-3 days

**Additional Information:**

Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

**DIRECT FISH results are preliminary:** G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY, The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.

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**Reflex Testing:**

If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

**Synonyms:**

- AV 18/XY
- Direct aneuploidy FISH 18/XY
- A18XY
- BA18XY

### COLLECTION

**Sample Type:**

Heparinized whole blood, Amniotic fluid, CVS, POC

**Collect:**

- Blood: Dark green top
- Amniotic fluid: Sterile screw top container
- CVS or POC: 15 mL centrifuge tube with transport media (Available from Cytogenetics: 353-4844)

**Amount to Collect:**

- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
POC: 10 mg

**Preferred Volume:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

**Minimum Volume:**
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- POC: 5 mg

**Stability (from collection to initiation):**
- 1-2 days

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### PROCESSING

**Test Code:**
- BA18XY: Blood
- A18XY: Bone marrow

**Performing Lab:**
- Medical genomics - Cytogenetics

**Specimen Preparation:**
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

**Preferred Volume:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

**Minimum Volume:**
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- POC: 5 mg

**Stability (from collection to initiation):**
- 1-2 days

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### RESULT INTERPRETATION

**Additional Information:**
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

**DIRECT FISH results are preliminary:** G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY. The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.
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**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x3, 88275, 88291

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BA18XY: Blood
- A18XY: Bone marrow

**Test Group:**
- FISH

**Performing Lab:**
- Medical genomics - Cytogenetics

**Performed:**
- Set up daily, Monday - Friday

**Methodology:**
- Fluorescent in-situ hybridization (FISH)

**Collect:**
- Blood: Dark green top
- Amniotic fluid: Sterile screw top container
- CVS or POC: 15 mL centrifuge tube with transport media (Available from Cytogenetics: 353-4844)

**Amount to Collect:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- ?POC: 10 mg

**Sample Type:**
- Heparinized whole blood, Amniotic fluid, CVS, POC

**Preferred Volume:**
- Whole blood, child or adult: 10 mL
- Whole blood, infant: 3 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- ?POC: 10 mg

**Minimum Volume:**
- Whole blood, child or adult: 3 mL
- Whole blood, infant: 1 mL
- Amniotic fluid: 5 mL
- CVS: 5 mg
- ?POC: 5 mg

**Specimen Preparation:**
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

**Synonyms:**
- AV 18/XY
- Direct aneuploidy FISH 18/XY
- A18XY
Stability (from collection to initiation):
1-2 days

Reported:
2-3 days

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Additional Information:
Direct FISH is limited to the detection of aneuploidy (increase or decrease in copy number) of chromosomes 13, 18, 21, X and Y by analyzing 50 INTERPHASE nuclei. This FISH contain 18/XY individual probe set only, 50 interphase nuclei will be analyzed. A normal result indicates that no numeric abnormality of chromosomes 18, X and Y were identified. It does not rule out the possibility of structural defects or numeric defects in other chromosomes.

DIRECT FISH results are preliminary: G-banded chromosome analysis of 15 colonies or 20 cells remains the standard of care for prenatal diagnosis and all cytogenetic studies. It is also standard of care that no irreversible therapeutic action be initiated on the basis of DIRECT FISH results alone. About one third of all chromosome abnormalities cannot be detected by DIRECT FISH, including structural abnormalities, mosaicism, and numerical abnormalities of other chromosomes.

"Direct FISH" is the UCSF Cytogenetics name for interphase fluorescence in situ hybridization (FISH) analysis for chromosomes 13, 18, 21, X, and Y. This probe will contain only 18 and XY. The UCSF lab currently utilizes the FDA-cleared probe set AneuVysionTM from Vysis, Inc. For this Direct FISH analysis, 50 cells are examined for this 18/XY probe set.

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CPT Codes:
88271 x3, 88275, 88291

LDT or Modified FDA:
Yes
Angiotensin Converting Enzyme, CSF

ACEC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric kinetic
Reported:
3-5 days
Additional Information:
This test is useful in diagnosing patients with sarcoidosis involving the central nervous system and meninges.

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL CSF
Minimum Volume:
0.2 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen 2 months

PROCESSING

Test Code:
ACEC
Test Group:
ACE
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze sample at -20C Order Quest # 34692N
Preferred Volume:
1 mL CSF
Minimum Volume:
0.2 mL CSF
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen 2 months

RESULT INTERPRETATION
Units:
U/L
Reference Interval:
<= 15 U/L
Additional Information:
This test is useful in diagnosing patients with sarcoidosis involving the central nervous system and meninges.

ADMINISTRATIVE

CPT Codes:
82164-90

COMPLETE VIEW

Available Stat:
No
Test Code:
ACEC
Test Group:
ACE
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Spectrophotometric kinetic
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Sample Type:
CSF
Preferred Volume:
1 mL CSF
Minimum Volume:
0.2 mL CSF
Specimen Preparation:
Freeze sample at -20C Order Quest # 34692N
Units:
U/L
Reference Interval:
<= 15 U/L
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen 2 months
Reported:
3-5 days
Additional Information:
This test is useful in diagnosing patients with sarcoidosis involving the central nervous system and meninges.
CPT Codes:
82164-90
Angiotensin Converting Enzyme, serum
ACE

ORDERING

Available Stat:
- No
Performing Lab:
- Quest
Methodology:
- Spectrophotometric kinetic
Reported:
- Test performed Monday-Saturday. Turnaround time: 2-4 days.
Synonyms:
- ACE

COLLECTION

Sample Type:
- Serum
Collect:
- Gold top
Amount to Collect:
- 2 mL blood
Preferred Volume:
- 1 mL serum
Minimum Volume:
- 0.2 mL serum

PROCESSING

Test Code:
- ACE
Test Group:
- ACE
Sendout:
- Yes
Performing Lab:
- Quest
Specimen Preparation:
- Centrifuge under refrigeration and separate serum within 1 hour of collection. Store refrigerated. Order Quest # 18572P
Preferred Volume:
- 1 mL serum
Minimum Volume:
- 0.2 mL serum

RESULT INTERPRETATION

Units:
- U/L
Reference Interval:
- Pediatric (6 mo-17 years): 13-100 U/L
- Adults (19-61 years): 9-67 U/L
ADMINISTRATIVE

CPT Codes:
- 82164-90

LOINC Codes:
- 2742-5

COMPLETE VIEW

Available Stat: No
Test Code: ACE
Test Group: ACE
Performing Lab: Quest
Sendout: Yes
Methodology:
  Spectrophotometric kinetic
Collect:
  Gold top
Amount to Collect:
  2 mL blood
Sample Type:
  Serum
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.2 mL serum
Specimen Preparation:
  Centrifuge under refrigeration and separate serum within 1 hour of collection. Store refrigerated. Order Quest # 18572P
Units:
  U/L
Reference Interval:
  Pediatric (6 mo-17 years): 13-100 U/L
  Adults (19-61 years): 9-67 U/L
Synonyms:
  • ACE
Reported:
  Test performed Monday-Saturday. Turnaround time: 2-4 days.
CPT Codes:
- 82164-90
LOINC Codes:
- 2742-5
**Anion Gap (Information only)**

**ORDERING**

Additional Information:

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test.

**RESULT INTERPRETATION**

Reference Interval:

4-14

Normal range was determined by testing 412 male and female healthy adult blood donors at UCSF.

Additional Information:

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test.

**COMPLETE VIEW**

Reference Interval:

4-14

Normal range was determined by testing 412 male and female healthy adult blood donors at UCSF.

Additional Information:

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test.
Anti-Adrenal Antibody Screen
ADRAB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
IFA
Reported:
4-6 days
Additional Information:
Adrenal Antibody is detected in patients with autoimmune adrenal disease, e.g., Addison's disease.
Reflex Testing:
If screen is positive, titer will be performed automatically and reported separately.

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top vacutainer
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

PROCESSING

Test Code:
ADRAB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot an freeze serum. Transport to CB frozen. Order Quest test code 42465N
Preferred Volume:
2 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
Printed 06/07/19
Test information subject to change
Additional Information:
Adrenal Antibody is detected in patients with autoimmune adrenal disease, e.g., Addison's disease.

CPT Codes:
86255-90

COMPLETE VIEW

Available Stat:
No

Test Code:
ADRAB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
IFA

Collect:
Gold top or Red top vacutainer

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Aliquot an freeze serum. Transport to CB frozen. Order Quest test code 42465N

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

Reported:
4-6 days

Reflex Testing:
If screen is positive, titer will be performed automatically and reported separately.

Additional Information:
Adrenal Antibody is detected in patients with autoimmune adrenal disease, e.g., Addison's disease.

CPT Codes:
86255-90
Anti-Angiotensin Type I Receptors
ILAT1R

ORDERING

Available Stat:  
Yes
Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:  
Luminex-based
Reported:  
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:  
This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.
In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:  
Yes

COLLECTION

Sample Type:  
Serum
Collect:  
Red top x 2
Amount to Collect:  
12 mL blood
Preferred Volume:  
6 mL serum
Remarks:  
Please see ITL Sample Collection Guide [here](#).
Stability (from collection to initiation):  
If kept at ambient temperature, can be good for up to 72 hours
Rejection Criteria:  
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:  
HTAT1R (Sunquest: ILAT1R)
Test Group:  
HLA Antibody Testing
Sendout:  
Yes
Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:  
6 mL serum
Rejection Criteria:  

Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**

If kept at ambient temperature, can be good for up to 72 hours

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### RESULT INTERPRETATION

**Additional Information:**

This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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### ADMINISTRATIVE

**CPT Codes:**

86832

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### COMPLETE VIEW

**Available Stat:**

Yes

**Test Code:**

HTAT1R (Sunquest: ILAT1R)

**Test Group:**

HLA Antibody Testing

**Performing Lab:**

Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**

Yes

**Methodology:**

Luminex-based

**Remarks:**

Please see ITL Sample Collection Guide [here](#).

**Collect:**

Red top x 2

**Amount to Collect:**

12 mL blood

**Sample Type:**

Serum

**Preferred Volume:**

6 mL serum

**Rejection Criteria:**

Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**

Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Stability (from collection to initiation):**

If kept at ambient temperature, can be good for up to 72 hours

**Reported:**

Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**

Yes

**Additional Information:**

This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.
In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:

86832
Antibodies to Extractable Nuclear Antigens  
AENA

ORDERING

Available Stat:  
No
Performing Lab:  
Immunology
Performed:  
Tuesday (day shift)
Methodology:  
Chemiluminescent
Reported:  
2-8 days

Additional Information:  
Systemic lupus erythematosus (SLE) is characterized by the presence of autoantibodies. One class of autoantibodies is directed against extractable nuclear antigens, often producing a speckled pattern on ANA screening.

Antibodies to Sm are present in approximately 40% of patients with SLE and are considered to be highly specific markers for this disease.

The RNP antigen is closely associated with the Sm antigen and is designated the Sm/RNP complex. Anti-RNP antibodies are found in a variety of rheumatic diseases including scleroderma, rheumatoid arthritis, discoid lupus, polymyositis, and Sjogren's syndrome.

Synonyms:  
- ENA  
- anti-SM  
- anti-RNP  
- anti-ENA  
- anti-smith  
- RNP antibody  
- Sm antibody  
- Smith antibody  
- Sm/RNP

COLLECTION

Sample Type:  
Serum
Collect:  
Gold top
Amount to Collect:  
2 mL blood
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.5 mL serum
Remarks:  
Avoid hemolysis

Unacceptable Conditions:  
Grossly hemolyzed, lipemic or icteric samples.
Test Code:
AENA
Performing Lab:
Immunology
Specimen Preparation:
Freeze serum at -20C
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples.

RESULT INTERPRETATION

Units:
Chemiluminescent Units (CU)
Reference Interval:
For both anti-SM and anti-RNP:
Negative: < 20 CU
Positive: >= 20 CU
Additional Information:
Systemic lupus erythematosus (SLE) is characterized by the presence of autoantibodies. One class of autoantibodies is directed against extractable nuclear antigens, often producing a speckled pattern on ANA screening.

Antibodies to Sm are present in approximately 40% of patients with SLE and are considered to be highly specific markers for this disease.

The RNP antigen is closely associated with the Sm antigen and is designated the Sm/RNP complex. Anti-RNP antibodies are found in a variety of rheumatic diseases including scleroderma, rheumatoid arthritis, discoid lupus, polymyositis, and Sjogren's syndrome.

ADMINISTRATIVE

CPT Codes:
86235 x 2
LOINC Codes:
43182-5

COMPLETE VIEW

Available Stat:
No
Test Code:
AENA
Performing Lab:
Immunology
Performed:
Tuesday (day shift)
Methodology:
Chemiluminescent
Remarks:
Avoid hemolysis
Collect:
Gold top
Amount to Collect:
2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric samples.

**Specimen Preparation:**
- Freeze serum at -20°C

**Units:**
- Chemiluminescent Units (CU)

**Reference Interval:**
- For both anti-SM and anti-RNP:
  - Negative: < 20 CU
  - Positive: >= 20 CU

**Synonyms:**
- ENA
- anti-SM
- anti-RNP
- anti-ENA
- anti-smith
- RNP antibody
- Sm antibody
- Smith antibody
- Sm/RNP

**Reported:**
- 2-8 days

**Additional Information:**
- Systemic lupus erythematosus (SLE) is characterized by the presence of autoantibodies. One class of autoantibodies is directed against extractable nuclear antigens, often producing a speckled pattern on ANA screening.

  Antibodies to Sm are present in approximately 40% of patients with SLE and are considered to be highly specific markers for this disease.

  The RNP antigen is closely associated with the Sm antigen and is designated the Sm/RNP complex. Anti-RNP antibodies are found in a variety of rheumatic diseases including scleroderma, rheumatoid arthritis, discoid lupus, polymyositis, and Sjogren's syndrome.

**CPT Codes:**
- 86235 x 2

**LOINC Codes:**
- 43182-5
**Anti-Cardiolipin Antibody, IgA**

**ACLA**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
ELISA

**Reported:**
Test is set up Monday-Saturday PM. Turnaround 2-3 days

**Synonyms:**
- anti-phospholipid antibody

### COLLECTION

**Sample Type:**
Serum, Citrated plasma

**Collect:**
Gold top or Blue top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.5 mL serum or plasma

**Remarks:**
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer.

### PROCESSING

**Test Code:**
ACLA

**Test Group:**
Anti-Cardiolipin

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Freeze serum or plasma at -20C. Order Quest # 4661X. **Note:** For Brown and Toland patients: Test procedure code is BTMOLT, and 1.0 frozen serum is shipped to LabCorp, test code 161836

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.5 mL serum or plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer.
RESULT INTERPRETATION

Units:
   APL U/mL
Reference Interval:
   Normal: < 10 APL U/mL
   Equivocal: 10-15 APL U/mL
   Positive: > 15 APL U/mL

ADMINISTRATIVE

CPT Codes:
   86147-90
LOINC Codes:
   5076-5

COMPLETE VIEW

Available Stat:
   No
Test Code:
   ACLA
Test Group:
   Anti-Cardiolipin
Performing Lab:
   Quest
Sendout:
   Yes
Methodology:
   ELISA
Remarks:
   If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.
Collect:
   Gold top or Blue top
Amount to Collect:
   2 mL blood
Sample Type:
   Serum, Citrated plasma
Preferred Volume:
   1 mL serum or plasma
Minimum Volume:
   0.5 mL serum or plasma
Unacceptable Conditions:
   Samples collected in outdated blue top vacutainer.
Specimen Preparation:
   Freeze serum or plasma at -20C. Note: For Brown and Toland patients: Test procedure code is BTMOLT, and 1.0 frozen serum is shipped to LabCorp, test code 161836
Units:
   APL U/mL
Reference Interval:
   Normal: < 10 APL U/mL
   Equivocal: 10-15 APL U/mL
   Positive: > 15 APL U/mL
Synonyms:
   • anti-phospholipid antibody
Reported:
   Test is set up Monday-Saturday PM. Turnaround 2-3 days
CPT Codes:
   86147-90
LOINC Codes:
   5076-5
Anti-Cardiolipin Antibody, IgG
ACLG

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Thursday (day shift)
Methodology:
Chemiluminescent Immunoassay
Reported:
Test run weekly, turn around time 2-8 days
Additional Information:
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

Synonyms:
- Anti-phospholipid antibody
- anticardiolipin antibody

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
ACLG
Test Group:
Anti-Cardiolipin
Performing Lab:
Immunology
Specimen Preparation:
Freeza serum at -20C
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Units:
C.U.
Reference Interval:
<20.1 CU

Additional Information:
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

ADMINISTRATIVE

CPT Codes:
86147

LOINC Codes:
24385-7

COMPLETE VIEW

Available Stat:
No

Test Code:
ACLG

Test Group:
Anti-Cardiolipin

Performing Lab:
Immunology

Performed:
Thursday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze serum at -20C

Units:
C.U.

Reference Interval:
<20.1 CU

Synonyms:
- Anti-phospholipid antibody
- Anticardiolipin antibody

Reported:
Test run weekly, turn around time 2-8 days

Additional Information:
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

CPT Codes:
86147

LOINC Codes:
# Anti-Cardiolipin Antibody, IgM

## ORDERING

**Available Stat:**
No

**Performing Lab:**
Immunology

**Performed:**
Thursday (day shift)

**Methodology:**
Chemiluminescent Immunoassay

**Reported:**
1-8 days

**Additional Information:**
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

**Synonyms:**
- anti-phospholipid antibody

## COLLECTION

**Sample Type:**
Serum

**Collect:**
Gold top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

## PROCESSING

**Test Code:**
ACLM

**Test Group:**
Anti-Cardiolipin

**Performing Lab:**
Immunology

**Specimen Preparation:**
Freeze serum at -20°C

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

## RESULT INTERPRETATION

**Units:**
C.U.
Reference Interval:
<20.1 CU

Additional Information:
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

CPT Codes:
86147

LOINC Codes:
24386-5

COMPLETE VIEW

Available Stat:
No

Test Code:
ACLM

Test Group:
Anti-Cardiolipin

Performing Lab:
Immunology

Performed:
Thursday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze serum at -20C

Units:
C.U.

Reference Interval:
<20.1 CU

Synonyms:
- anti-phospholipid antibody

Reported:
1-8 days

Additional Information:
Assays for antibodies to phospholipids are not well standardized and significant inter-laboratory variability exists. As such it is recommended that repeat testing be performed by the same method by the same laboratory. The units used do not correlate to a titer.

CPT Codes:
86147

LOINC Codes:
24386-5
Anti-Cyclic Citrullinated Peptide Antibody (IgG)

CYCP

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday (day shift)
Methodology:
Chemiluminescent immunoassay
Reported:
2-9 days
Additional Information:
The main clinically useful biologic markers in diagnosis of patients with rheumatoid arthritis (RA) are rheumatoid factor and antibodies to citrullinated peptides. These antibodies may also be useful for prediction of functional and radiographic outcomes. Anti-perinuclear antibodies (also called anti-keratin antibodies) often found in patients with RA recognize an epitope that contains the deimidated form of arginine called citrulline.

This test uses a third generation cyclic citrullinated peptide (CCP) antigen for detection of these antibodies. Presence of these antibodies is thought to be very specific for RA but not as sensitive as rheumatoid factor. Recent studies suggest that use of RF and CCP antibodies together may provide better sensitivity for diagnosis of RA than either alone. Note that at the present time, CCP antibodies are not considered part of the diagnostic criteria for RA. Test results that fall in the weak positive range may be repeated, if clinically indicated for diagnostic purposes, or may reflect treatment of a patient with an existing clinical diagnosis.

Synonyms:
- CCP
- anti-CCP

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum

PROCESSING

Test Code:
CYCP
Performing Lab:
Immunology
Specimen Preparation:
Freeze serum at -20C
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
RESULT INTERPRETATION

Units:

C.U.

Reference Interval:
<20.0 CU

Additional Information:

The main clinically useful biologic markers in diagnosis of patients with rheumatoid arthritis (RA) are rheumatoid factor and antibodies to citrullinated peptides. These antibodies may also be useful for prediction of functional and radiographic outcomes. Anti-perinuclear antibodies (also called anti-keratin antibodies) often found in patients with RA recognize an epitope that contains the deimidated form of arginine called citrulline.

This test uses a third generation cyclic citrullinated peptide (CCP) antigen for detection of these antibodies. Presence of these antibodies is thought to be very specific for RA but not as sensitive as rheumatoid factor. Recent studies suggest that use of RF and CCP antibodies together may provide better sensitivity for diagnosis of RA than either alone. Note that at the present time, CCP antibodies are not considered part of the diagnostic criteria for RA. Test results that fall in the weak positive range may be repeated, if clinically indicated for diagnostic purposes, or may reflect treatment of a patient with an existing clinical diagnosis.

ADMINISTRATIVE

CPT Codes:
86200

LOINC Codes:
33935-8

COMPLETE VIEW

Available Stat:
No

Test Code:
CYCP

Performing Lab:
Immunology

Performed:
Monday (day shift)

Methodology:
Chemiluminescent immunoassay

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Freeze serum at -20C

Units:
C.U.

Reference Interval:
<20.0 CU

Synonyms:
• CCP
- anti-CCP

**Reported:**
2-9 days

**Additional Information:**
The main clinically useful biologic markers in diagnosis of patients with rheumatoid arthritis (RA) are rheumatoid factor and antibodies to citrullinated peptides. These antibodies may also be useful for prediction of functional and radiographic outcomes. Anti-perinuclear antibodies (also called anti-keratin antibodies) often found in patients with RA recognize an epitope that contains the deimidated form of arginine called citrulline.

This test uses a third generation cyclic citrullinated peptide (CCP) antigen for detection of these antibodies. Presence of these antibodies is thought to be very specific for RA but not as sensitive as rheumatoid factor. Recent studies suggest that use of RF and CCP antibodies together may provide better sensitivity for diagnosis of RA than either alone. Note that at the present time, CCP antibodies are not considered part of the diagnostic criteria for RA. Test results that fall in the weak positive range may be repeated, if clinically indicated for diagnostic purposes, or may reflect treatment of a patient with an existing clinical diagnosis.

**CPT Codes:**
86200

**LOINC Codes:**
33935-8
Anti-Factor Xa Activity, Low Molecular Weight Heparin
LMHEP

ORDERING

Ordering Recommendations:
For patients receiving Low Molecular Weight Heparin only:
- Enoxaparin
- Dalteparin
- Tinzaparin
Available Stat:
Yes
Performing Lab:
- Parnassus Hematology
- Mission Bay Hematology
Performed:
Daily
Methodology:
Chromogenic
Reported:
- STAT: 1 hour
- Routine: 24 hours
Additional Information:
The utility of measuring LMW heparin levels is limited to a few clinical settings. Common indications for monitoring patients receiving LMW heparin include renal insufficiency, clinical obesity, weight < 50 kg or pregnancy.

The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
- Hydrolysis of the substrate by factor Xa
- Inhibition of factor Xa by the heparin-antithrombin complex.*
After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
*The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

The appropriate therapeutic range will vary with the specific medication, the disease, and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

Synonyms:
- LMW
- LMWH

COLLECTION

Sample Type:
Plasma
Collect:
- Blue top filled to full extent of vacuum (3.2% sodium citrate)
Amount to Collect:
- See Preferred Volume
Preferred Volume:
- 1.0 mL plasma
Minimum Volume:
- 0.5 mL plasma
Remarks:
- Deliver specimen to lab immediately for processing
Stability (from collection to initiation):
Stability (from collection to initiation): 2 hours

Storage/Transport Temperature:
Deliver whole blood at room temperature
Plasma acceptable on dry ice and stored -20 to -80C

RESULT INTERPRETATION

Units:
U/mL

Reference Interval:
Therapeutic (4 hours post dose):

Enoxaparin:
Q12 dosing 0.5-1.0 U/mL
Qday dosing 1.0-2.0 U/mL
Prophylactic dosing 0.2-0.4 U/mL

Dalteparin:
Q12 dosing 0.6 U/mL
Qday dosing 1.05 U/mL

Tinzaparin:
Qday dosing 0.85 U/mL

These are general guidelines only. Detailed recommendations for heparin therapy and monitoring are available through the the Hematology consultation services: for adults, pager 443-4276, for pediatrics, pager 443-6966.

Critical Values:
>2.0 U/mL
Additional Information:
The utility of measuring LMW heparin levels is limited to a few clinical settings. Common indications for monitoring patients receiving LMW heparin include renal insufficiency, clinical obesity, weight < 50 kg or pregnancy.

The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
- Hydrolysis of the substrate by factor Xa
- Inhibition of factor Xa by the heparin-antithrombin complex*.
After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
*The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

The appropriate therapeutic range will vary with the specific medication, the disease, and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

ADMINISTRATIVE

CPT Codes:
- 85520

LOINC Codes:
- 3271-4

COMPLETE VIEW

Available Stat:
- Yes

Ordering Recommendations:
- For patients receiving Low Molecular Weight Heparin only:
  - Enoxaparin
  - Dalteparin
  - Tinzaparin

Test Code:
- LMHEP

Performing Lab:
- Parnassus Hematology
- Mission Bay Hematology

Performed:
- Daily

Methodology:
- Chromogenic

Remarks:
- Deliver specimen to lab immediately for processing

Collect:
- Blue top filled to full extent of vacuum (3.2% sodium citrate)

Amount to Collect:
- See Preferred Volume

Sample Type:
- Plasma

Preferred Volume:
- 1.0 mL plasma

Minimum Volume:
- 0.5 mL plasma

Unacceptable Conditions:
- Hemolysis, Icterus, Lipemia
- Under-filled or Over-filled tubes
- Clotted
Specimen Preparation:
Deliver sample immediately to Hematology Lab

Units:
U/mL

Reference Interval:
Therapeutic (4 hours post dose):
Enoxaparin:
Q12 dosing 0.5-1.0 U/mL
Qday dosing 1.0-2.0 U/mL
Prophylactic dosing 0.2-0.4 U/mL

Dalteparin:
Q12 dosing 0.6 U/mL
Qday dosing 1.05 U/mL

Tinzaparin:
Qday dosing 0.85 U/mL

These are general guidelines only. Detailed recommendations for heparin therapy and monitoring are available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics, pager 443-6966.

Critical Values:
>2.0 U/mL

Synonyms:
- LMW
- LMWH

Storage/Transport Temperature:
Deliver whole blood at room temperature
Plasma acceptable on dry ice and stored -20 to -80C

Stability (from collection to initiation):
2 hours

Reported:
STAT: 1 hour
Routine: 24 hours

Additional Information:
The utility of measuring LMW heparin levels is limited to a few clinical settings. Common indications for monitoring patients receiving LMW heparin include renal insufficiency, clinical obesity, weight < 50 kg or pregnancy.

The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
- Hydrolysis of the substrate by factor Xa
- Inhibition of factor Xa by the heparin-antithrombin complex*.
After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
*The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

The appropriate therapeutic range will vary with the specific medication, the disease, and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

CPT Codes:
85520

LOINC Codes:
3271-4
Anti-Factor Xa Activity, Unfractionated Heparin
UNHEP

ORDERING

Ordering Recommendations:
For patients on Unfractionated Heparin by infusion only

Performing Lab:
Parnassus Hematology, Mission Bay Hematology

Performed:
24 hours per day, 7 days per week

Methodology:
Chromogenic

Reported:
1 hour from receipt in Hematology

Additional Information:
The utility of measuring heparin levels has been demonstrated in a few clinical settings. Patients receiving unfractionated heparin require heparin levels if there is heparin resistance (adults requiring more than 35,000 units/day) or if a lupus anticoagulant is present; in such conditions the PTT may not be an accurate indicator of anticoagulation.

The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
- Hydrolysis of the substrate by factor Xa
- Inhibition of factor Xa by the heparin-antithrombin complex*

After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
*The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

Synonyms:
- Anti-Xa Level

COLLECTION

Sample Type:
Blood

Collect:
Blue top filled to full extent of vacuum (3.2% sodium citrate)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
Deliver specimen to lab immediately for processing

Stability (from collection to initiation):
2 hours

Storage/Transport Temperature:
Deliver whole blood at room temperature
Plasma acceptable on dry ice and stored -20 to -80C

Unacceptable Conditions:
Hemolysis, Icterus, Lipemia
Under-filled or Over-filled tubes
Clotted

PROCESSING

Test Code:
- UNHEP

Performing Lab:
- Parnassus Hematology, Mission Bay Hematology

Specimen Preparation:
- Deliver sample immediately to Hematology Lab

Preferred Volume:
- 1 mL plasma

Minimum Volume:
- 0.5 mL plasma

Unacceptable Conditions:
- Hemolysis, Icterus, Lipemia
- Under-filled or Over-filled tubes
- Clotted

Stability (from collection to initiation):
- 2 hours

Storage/Transport Temperature:
- Deliver whole blood at room temperature
- Plasma acceptable on dry ice and stored -20 to -80C

RESULT INTERPRETATION

Units:
- U/mL

Reference Interval:
- Therapeutic:
  - UFH by infusion: 0.3 - 0.7 anti-Xa U/mL

Critical Values:
- >0.70 anti-Xa U/mL

Additional Information:
- The utility of measuring heparin levels has been demonstrated in a few clinical settings. Patients receiving unfractionated heparin require heparin levels if there is heparin resistance (adults requiring more than 35,000 units/day) or if a lupus anticoagulant is present; in such conditions the PTT may not be an accurate indicator of anticoagulation.

- The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
  - Hydrolysis of the substrate by factor Xa
  - Inhibition of factor Xa by the heparin-antithrombin complex*.

- After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
  - *The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

- The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

ADMINISTRATIVE

CPT Codes:
- 85520

LOINC Codes:
- 3274-8
Ordering Recommendations:
   For patients on Unfractionated Heparin by infusion only

Test Code:
   UNHEP

Performing Lab:
   Parnassus Hematology, Mission Bay Hematology

Performed:
   24 hours per day, 7 days per week

Methodology:
   Chromogenic

Remarks:
   Deliver specimen to lab immediately for processing

Collect:
   Blue top filled to full extent of vacuum (3.2% sodium citrate)

Amount to Collect:
   2 mL blood

Sample Type:
   Blood

Preferred Volume:
   1 mL plasma

Minimum Volume:
   0.5 mL plasma

Unacceptable Conditions:
   Hemolysis, Icterus, Lipemia
   Under-filled or Over-filled tubes
   Clotted

Specimen Preparation:
   Deliver sample immediately to Hematology Lab

Units:
   U/mL

Reference Interval:
   Therapeutic:
   UFH by infusion: 0.3 - 0.7 anti-Xa U/mL

Critical Values:
   >0.70 anti-Xa U/mL

Synonyms:
   ● Anti-Xa Level

Storage/Transport Temperature:
   Deliver whole blood at room temperature
   Plasma acceptable on dry ice and stored -20 to -80C

Stability (from collection to initiation):
   2 hours

Reported:
   1 hour from receipt in Hematology

Additional Information:
   The utility of measuring heparin levels has been demonstrated in a few clinical settings. Patients receiving unfractionated heparin require heparin levels if there is heparin resistance (adults requiring more than 35,000 units/day) or if a lupus anticoagulant is present; in such conditions the PTT may not be an accurate indicator of anticoagulation.

   The STA- Liquid anti-Xa method is a one-step reaction where factor Xa is added to the plasma-substrate mixture. Two reactions take place simultaneously,
   - Hydrolysis of the substrate by factor Xa
   - Inhibition of factor Xa by the heparin-antithrombin complex*

   After the necessary period of time for the competitive reaction to reach equilibrium, the quantity of pNA that is released is inversely proportional to the concentration of heparin present in the test medium.
*The heparin-antithrombin complex is made up from the heparin and the antithrombin peculiar to the patient.

The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available on the UCSF Carelinks webpage for reference purposes only. Recommendations for therapy and monitoring are also available through the Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

CPT Codes:
85520

LOINC Codes:
3274-8
**Anti-IgA**

**AIGA**

**ORDERING**

Available Stat:
No

Performing Lab:
Mayo

Methodology:
Fluorescent microsphere assay

Reported:
7-14 days.

Additional Information:
These IgG antibodies to IgA may be of limited specificity or class-specific.

**COLLECTION**

Sample Type:
Serum

Collect:
Gold top, Red top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Remarks:
Note: If testing is due to a transfusion reaction, the specimen should be drawn approximately a minimum of 10 days after the reaction. Testing performed on serum drawn immediately after a reaction may be falsely negative as transfused IgA may deplete anti-IgA antibodies.

**PROCESSING**

Test Code:
AIGA

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Refrigerate sample. Order MAYO# 8154. Call MCS for pickup.

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

**RESULT INTERPRETATION**

Units:
Units

Reference Interval:
Negative: <= 52.0 Units
Positive: > 52.0 Units

**Additional Information:**
These IgG antibodies to IgA may be of limited specificity or class-specific.

**ADMINISTRATIVE**

**CPT Codes:**
- 83520-90

**LOINC Codes:**
- 44584-1

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- AIGA

**Performing Lab:**
- Mayo

**Sendout:**
- Yes

**Methodology:**
- Fluorescent microsphere assay

**Remarks:**
- **Note:** If testing is due to a transfusion reaction, the specimen should be drawn approximately a minimum of 10 days after the reaction. Testing performed on serum drawn immediately after a reaction may be falsely negative as transfused IgA may deplete anti-IgA antibodies.

**Collect:**
- Gold top, Red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Specimen Preparation:**
- Refrigerate sample. Order MAYO# 8154. Call MCS for pickup.

**Units:**
- Units

**Reference Interval:**
- Negative: <= 52.0 Units
- Positive: > 52.0 Units

**Reported:**
- 7-14 days.

**Additional Information:**
- These IgG antibodies to IgA may be of limited specificity or class-specific.

**CPT Codes:**
- 83520-90

**LOINC Codes:**
- 44584-1
Antimicrobial Synergy Study
B043

ORDERING

Approval Required:
Yes, contact Microbiology x3-1268
Available Stat:
No
Performing Lab:
Microbiology
Additional Information:
This test is only orderable by the Microbiology staff.

PROCESSING

Test Code:
B043
Performing Lab:
Microbiology

RESULT INTERPRETATION

Additional Information:
This test is only orderable by the Microbiology staff.

ADMINISTRATIVE

CPT Codes:
87188

COMPLETE VIEW

Approval Required:
Yes, contact Microbiology x3-1268
Available Stat:
No
Test Code:
B043
Performing Lab:
Microbiology
Additional Information:
This test is only orderable by the Microbiology staff.
CPT Codes:
87188
Anti-Mullerian Hormone
AMHM

ORDERING
Performing Lab: ARUP
Performed: Sun-Sat
Methodology: Quantitative Enzyme-Linked Immunosorbent Assay
Reported: 1-3 days
Synonyms:
- MIF
- MIH
- MIS
- Mullerian inhibiting factor
- Mullerian-inhibiting hormone
- Mullerian-inhibiting substance

COLLECTION
Collect:
Serum separator tube. Also acceptable: Plain red or green (lithium heparin).
Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature: Frozen.

PROCESSING
Test Code: AMHM
ARUP Test Code: 2002656
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.2 mL)
Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Frozen.

RESULT INTERPRETATION
Reference Interval:

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<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
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</thead>
<tbody>
<tr>
<td>Effective April 7, 2014</td>
<td></td>
<td></td>
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</table>
### ADMINISTRATIVE

**CPT Codes:**

83520

**COMPLETE VIEW**

**Test Code:**

AMHM

**ARUP Test Code:**

2002656

**Performing Lab:**

ARUP

**Sendout:**

Yes

**Performed:**

Sun-Sat

**Methodology:**

Quantitative Enzyme-Linked Immunosorbent Assay

**Collect:**

Serum separator tube. Also acceptable: Plain red or green (lithium heparin).

**Specimen Preparation:**

Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum to an ARUP Standard Transport Tube. (Min: 0.2 mL)

**Reference Interval:**

Effective April 7, 2014

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval</th>
<th>Age</th>
<th>Reference Interval</th>
</tr>
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<tbody>
<tr>
<td>6 months - 14 years</td>
<td>0.256-6.345 ng/mL</td>
<td>6-11 months</td>
<td>56.677-495.299 ng/mL</td>
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<tr>
<td>15-17 years</td>
<td>0.861-10.451 ng/mL</td>
<td>1-6 years</td>
<td>33.442-342.450 ng/ml</td>
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<td>18-29 years</td>
<td>0.401-16.015 ng/mL</td>
<td>7-9 years</td>
<td>20.245-189.781 ng/mL</td>
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<tr>
<td>30-39 years</td>
<td>0.178-11.705 ng/mL</td>
<td>10-12 years</td>
<td>2.903-178.243 ng/mL</td>
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<td>40-45 years</td>
<td>6.282 ng/mL or less</td>
<td>13 years or greater</td>
<td>2.079-30.656 ng/mL</td>
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<tr>
<td>46-50 years</td>
<td>0.064 ng/mL or less</td>
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<tr>
<td>Post-menopausal</td>
<td>0.003 ng/mL or less</td>
<td></td>
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</table>

**Synonyms:**

- MIF
- MIH
- MIS
- Mullerian inhibiting factor
- Mullerian-inhibiting hormone
- Mullerian-inhibiting substance

**Storage/Transport Temperature:**

Printed 06/07/19
Test information subject to change
Frozen.

**Stability (from collection to initiation):**
- Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)

**Reported:**
- 1-3 days

**CPT Codes:**
- 83520
Anti-Nuclear Antibodies
ANA

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Reported: 1-3 days
Additional Information: Anti-Centromere and Anti-Nucleolar antibodies will be reported if present.

LE Prep is not an offered test. Order Anti-Nuclear antibodies

Reflex Testing: Positive samples will automatically be titered and a separate charge applied.

Synonyms:
- ANA
- LE Preparation
- LE Prep
- Antinuclear antibodies
- ANT
- anti-centromere antibodies
- anti-nucleolar antibodies

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Stability (from collection to initiation): Refrigerated 4 days

PROCESSING

Test Code: ANA
Performing Lab: Immunology
Specimen Preparation: Refrigerate sample
Preferred Volume: 0.5 mL serum
Stability (from collection to initiation): 

Test information subject to change
**RESULT INTERPRETATION**

**Units:**
titer

**Reference Interval:**
Negative titer < 40

**Additional Information:**
Anti-Centromere and Anti-Nucleolar antibodies will be reported if present.

LE Prep is not an offered test. Order Anti-Nuclear antibodies

**ADMINISTRATIVE**

**CPT Codes:**
86038

**LOINC Codes:**
5048-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
ANA

**Performing Lab:**
Immunology

**Performed:**
Monday-Friday (day shift)

**Collect:**
Gold top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum

**Specimen Preparation:**
Refrigerate sample

**Units:**
titer

**Reference Interval:**
Negative titer < 40

**Synonyms:**
- ANA
- LE Preparation
- LE Prep
- Antinuclear antibodies
- ANT
- anti-centromere antibodies
- anti-nucleolar antibodies

**Stability (from collection to initiation):**
Refrigerated 4 days

**Reported:**
1-3 days

**Reflex Testing:**
Positive samples will automatically be titered and a separate charge applied.

**Additional Information:**
Anti-Centromere and Anti-Nucleolar antibodies will be reported if present.

LE Prep is not an offered test. Order Anti-Nuclear antibodies

**CPT Codes:**
86038

**LOINC Codes:**
5048-4
Anti-Phospholipid Antibody Panel
APLA

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology, Immunology
Additional Information:
Panel includes Russell's Viper Venom Test (RVVTM), Lupus Anticoagulant by HEXA (HEXA), Anticardiolipin Antibodies IgG & IgM (ACLG, ACLM), and Beta 2 Glycoprotein Antibodies IgG & IgM (B2GPG, B2GPM). If "Anti-phospholipid Antibody" is ordered without further specification, the Anti-phospholipid Panel will be performed.

Lupus anticoagulants, along with anti-cardiolipin antibodies and anti-Beta 2 Glycoprotein antibodies, are the major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Russell's Viper Venom Test, Lupus Anticoagulant by HEXA, Anticardiolipin Antibodies IgG & IgM, and anti-Beta 2 Glycoprotein Antibodies IgG & IgM, each be performed as clinically indicated.

Synonyms:
- LA
- Lupus anticoagulant
- antiphospholipid syndrome

COLLECTION

Sample Type:
Citrated plasma AND serum
Collect:
Blue tops filled to full extent of vacuum x 2 and Gold top x1 (Red top acceptable)
Amount to Collect:
Two full Blue tops AND 2 mL blood in Gold top (Red top acceptable)
Preferred Volume:
2 mL citrated plasma AND 1 mL serum
Minimum Volume:
1 mL citrated plasma AND 0.6 mL serum
Remarks:
Check the expiration date on the label of the blue top vacutainer before drawing the patient.
Fill 2 Blue tops to full extent of vacuum, Gold top (or Red top) must contain at least 2 mL blood.
For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code:
APLA
Test Group:
Anti-phospholipid
Performing Lab:
Parnassus Hematology, Immunology
Specimen Preparation:
If "Anti-phospholipid Antibody" is ordered without further specification, order the Anti-phospholipid Panel (APLA).
Panel contains the following test codes: RVVTM, HEXA, ACLM, ACLG, B2GPG, B2GPM

**Preferred Volume:**
- 2 mL citrated plasma AND 1 mL serum

**Minimum Volume:**
- 1 mL citrated plasma AND 0.6 mL serum

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer.

### RESULT INTERPRETATION

**Additional Information:**
- Panel includes Russell's Viper Venom Test (RVVTM), Lupus Anticoagulant by HEXA (HEXA), Anticardiolipin Antibodies IgG & IgM (ACLG, ACLM), and Beta 2 Glycoprotein Antibodies IgG & IgM (B2GPG, B2GPM). If “Anti-phospholipid Antibody” is ordered without further specification, the Anti-phospholipid Panel will be performed.

- Lupus anticoagulants, along with anti-cardiolipin antibodies and anti-Beta 2 Glycoprotein antibodies, are the major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Russell's Viper Venom Test, Lupus Anticoagulant by HEXA, Anticardiolipin Antibodies IgG & IgM, and anti-Beta 2 Glycoprotein Antibodies IgG & IgM, each be performed as clinically indicated.

### ADMINISTRATIVE

**CPT Codes:**
- 86147

**LOINC Codes:**
- 55395-8

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- APLA

**Test Group:**
- Anti-phospholipid

**Performing Lab:**
- Parnassus Hematology, Immunology

**Remarks:**
- Check the expiration date on the label of the blue top vacutainer before drawing the patient.
- Fill 2 Blue tops to full extent of vacuum, Gold top (or Red top) must contain at least 2 mL blood.
- For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Collect:**
- Blue tops filled to full extent of vacuum x 2 and Gold top x1 (Red top acceptable)

**Amount to Collect:**
- Two full Blue tops AND 2 mL blood in Gold top (Red top acceptable)

**Sample Type:**
- Citrated plasma AND serum

**Preferred Volume:**
- 2 mL citrated plasma AND 1 mL serum

**Minimum Volume:**
- 1 mL citrated plasma AND 0.6 mL serum

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer.
Specimen Preparation:
If "Anti-phospholipid Antibody" is ordered without further specification, order the Anti-phospholipid Panel (APLA).

Panel contains the following test codes: RVVTM, HEXA, ACLM, ALCG, B2GPG, B2GPM

Synonyms:
- LA
- Lupus anticoagulant
- antiphospholipid syndrome

Additional Information:
Panel includes Russell's Viper Venom Test (RVVTM), Lupus Anticoagulant by HEXA (HEXA), Anticardiolipin Antibodies IgG & IgM (ACLG, ACLM), and Beta 2 Glycoprotein Antibodies IgG & IgM (B2GPG, B2GPM). If "Anti-phospholipid Antibody" is ordered without further specification, the Anti-phospholipid Panel will be performed.

Lupus anticoagulants, along with anti-cardiolipin antibodies and anti-Beta 2 Glycoprotein antibodies, are the major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Russell's Viper Venom Test, Lupus Anticoagulant by HEXA, Anticardiolipin Antibodies IgG & IgM, and anti- Beta 2 Glycoprotein Antibodies IgG & IgM, each be performed as clinically indicated.

CPT Codes:
86147

LOINC Codes:
55395-8
Antiplasmin Activity
A2PI

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Colorimetry w/synthetic chromagenic substrate
Reported:
7 days.
Additional Information:
Antiplasmin Activity is primarily due to alpha-2-antiplasmin, w/ some interference from alpha-2-macroglobulin.
Synonyms:
- Alpha-2-Antiplasmin
- A2-AP
- Alpha-2-plasmin inhibitor
- A2-antiplasmin
- A2-PI

COLLECTION

Sample Type:
Citrated Plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
A2PI
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Separate plasma by centrifugation, then recentrifuge the separated plasma to avoid spurious results from platelet contamination. Promptly freeze an 0.5 mL aliquot of the respun plasma in a plastic vial at -70°C. Call MCS for pick-up and ship on dry ice. The sample must be accompanied by a completed Mayo Medical Laboratories "Coagulation Request Form". Order MAYO# 9084
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
% activity
Reference Interval:
Newborn: >= 50%
>= 18 year old: 80-140%
30-36 wk premature infants may not reach adult levels for up to 90 days of age.
Additional Information:
Antiplasmin Activity is primarily due to alpha-2-antiplasmin, w/ some interference from alpha-2-macroglobulin.

ADMINISTRATIVE

CPT Codes:
85410-90
LOINC Codes:
27810-1

COMPLETE VIEW

Available Stat:
No
Test Code:
A2PI
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
Colorimetry w/synthetic chromagenic ubstrate
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated Plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Separate plasma by centrifugation, then recentrifuge the separated plasma to avoid spurious results from platelet contamination. Promptly freeze an 0.5 mL aliquot of the respun plasma in a plastic vial at -70C. Call MCS for pick-up and ship on dry ice. The sample must be accompanied by a completed Mayo Medical Laboratories "Coagulation Request Form". Order MAYO# 9084

Units:
% activity

Reference Interval:
Newborn: >= 50%
>= 18 year old: 80-140%

30-36 wk premature infants may not reach adult levels for up to 90 days of age.

Synonyms:
- Alpha-2-Antiplasmin
- A2-AP
- Alpha-2-plasmin inhibitor
- A2-antiplasmin
- A2-PI

Reported:
7 days.

Additional Information:
Antiplasmin Activity is primarily due to alpha-2-antiplasmin, with some interference from alpha-2-macroglobulin.

CPT Codes:
85410-90

LOINC Codes:
27810-1
Anti-Streptolysin O
ASO

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Rate Nephelometry
Reported: Test performed Tu, Thur, and Saturday. Turnaround time: 2-4 days.
Synonyms:
- ASO
- Antistreptolysin O
- ASLO
- ASOT
- ASTO
- Streptolysin titer

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

PROCESSING

Test Code: ASO
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest # 53702P
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

RESULT INTERPRETATION

Units:
IU/mL
Reference Interval:
<= 200 IU/mL

ADMINISTRATIVE

CPT Codes:
86060-90
LOINC Codes:
5370-2

COMPLETE VIEW

Available Stat:
No
Test Code:
ASO
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Rate Nephelometry
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Specimen Preparation:
Refrigerate. Order Quest # 53702P
Units:
IU/mL
Reference Interval:
<= 200 IU/mL
Synonyms:
- ASO
- Antistreptolysin O
- ASLO
- ASOT
- ASTO
- Streptolysin titer

Reported:
Test performed Tu, Thur, and Saturday. Turnaround time: 2-4 days.
CPT Codes:
86060-90
LOINC Codes:
5370-2
Antithrombin Activity
AT

ORDERING

Available Stat:
Yes, Mission Bay only

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
Mission Bay: 24-hours per day, 7-days per week
Parnassus: Test run every Monday 0800 - 1600.
If urgently needed, contact Parnassus hematology lab at 353 - 1747

Inform appropriate lab by phone when initiating ECLS anticoagulation protocol

Methodology:
Chromogenic substrate

Reported:
Mission Bay: STAT 1 hour, Routine 4 hours
Parnassus: 1-2 weeks

Additional Information:
A low level of antithrombin may be associated with an inherited deficiency or with secondary causes such as acute venous thrombosis, liver disease, disseminated intravascular coagulation, heparin therapy, pregnancy, estrogen therapy, and nephropathy with proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- ATIII
- AT3
- AT III
- AT Activity
- Anithrombin III Activity

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.

2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.

3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.

4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
For patients with Hct's >= 55% please contact Hematology (Parnassus: 353-1747, Mission Bay 476-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

### PROCESSING

**Test Code:**
AT

**Test Group:**
Antithrombin

**Performing Lab:**
Parnassus & Mission Bay Hematology

**Specimen Preparation:**
Deliver sample to Hematology asap for processing. Test specimens within four hours of collection or freeze plasma in a plastic tubes at -20C.

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

### RESULT INTERPRETATION

**Units:**
% activity

**Reference Interval:**
Adults: 79-120%

Neonatal normal ranges based on antithrombin activity are not available. We have included normal ranges below for neonates based on antigen levels which should roughly correlate with activity.

**Full term Neonates**
- Day 1: 39-87%
- Day 5: 41-93%
- Day 30: 48-108%
- Day 90: 73-121%


**Healthy Premature Neonates**
- Day 1: 14-62%
- Day 5: 30-82%
- Day 30: 37-81%
- Day 90: 45-121%
- Day 180: 52-128%


**Additional Information:**
A low level of antithrombin may be associated with an inherited deficiency or with secondary causes such as acute venous thrombosis, liver disease, disseminated intravascular coagulation, heparin therapy, pregnancy, estrogen therapy, and nephropathy with proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for
CPT Codes:
85300
LOINC Codes:
27811-9

COMPLETE VIEW

Available Stat:
Yes, Mission Bay only

Test Code:
AT

Test Group:
Antithrombin

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
Mission Bay: 24-hours per day, 7-days per week
Parnassus: Test run every Monday 0800 - 1600.
If urgently needed, contact Parnassus hematology lab at 353 - 1747
Inform appropriate lab by phone when initiating ECLS anticoagulation protocol

Methodology:
Chromogenic substrate

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
For patients with Hct's >= 55% please contact Hematology (Parnassus: 353-1747, Mission Bay 476-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Deliver sample to Hematology asap for processing. Test specimens within four hours of collection or freeze plasma in a plastic tubes at -20C.

Units:
% activity

Reference Interval:
Adults: 79-120%

Neonatal normal ranges based on antithrombin activity are not available. We have included normal ranges below for neonates based on...
antigen levels which should roughly correlate with activity.

**Full term Neonates**
Day 1: 39-87%
Day 5: 41-93%
Day 30: 48-108%
Day 90: 73-121%


**Healthy Premature Neonates**
Day 1: 14-62%
Day 5: 30-82%
Day 30: 37-81%
Day 90: 45-121%
Day 180: 52-128%


**Synonyms:**
- ATIII
- AT3
- AT III
- AT Activity
- Anithrombin III Activity

**Reported:**
Mission Bay: STAT 1 hour, Routine 4 hours
Parnassus: 1-2 weeks

**Additional Information:**
A low level of antithrombin may be associated with an inherited deficiency or with secondary causes such as acute venous thrombosis, liver disease, disseminated intravascular coagulation, heparin therapy, pregnancy, estrogen therapy, and nephropathy with proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
85300

**LOINC Codes:**
27811-9
Apolipoprotein E (APOE) Genotyping, Alzheimer Disease Risk

APOEZ

**ORDERING**

Ordering Recommendations:
Supports a clinical diagnosis of Alzheimer disease (AD) in symptomatic individuals. Use for AD risk assessment only. Genetic counseling and informed consent are strongly recommended prior to ordering and post test to discuss results.

Performing Lab:
ARUP

Performed:
Mon, Thu

Methodology:
Polymerase Chain Reaction/Fluorescence Monitoring

Reported:
2-7 days

Synonyms:
- Alzheimer’s
- Alzheimer’s
- Alzheimers
- APOE
- ApoE 2 mutations
- ApoE Alzheimer Risk
- ApoLipoprotein E Genotype

**COLLECTION**

Sample Type:
Whole blood

Collect:
Lavender (EDTA), Pink (K₂EDTA), or Yellow (ACD Solution A or B).

Amount to Collect:
3 mL

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Remarks:
Testing of fetal specimens or specimens from patients under the age of 18 years is not offered.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month.

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

**PROCESSING**

Test Code:
APOEZ

ARUP Test Code:
2013341
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation:
  Transport 3 mL whole blood. (Min: 1 mL)
Additional Processing Instructions:
  Do not aliquot. Send sample refrigerated to CB. Order ARUP test code 2013341.
Preferred Volume: 3 mL
Minimum Volume: 1 mL
Unacceptable Conditions:
  Plasma or serum. Heparinized specimens.
Stability (from collection to initiation):
  Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month.
Storage/Transport Temperature:
  Refrigerated.

RESULT INTERPRETATION

Reference Interval:
  Homozygous apo e3 (e3/e3): This genotype is the most common (normal) genotype.
Interpretive Data:
  Background Information for Apolipoprotein E (APOE) Genotyping, Alzheimer Disease Risk
  Characteristics: Alzheimer disease (AD), the most common cause of dementia, is characterized by progressive cognitive decline
  including memory, problem-solving skills, multi-step tasks, planning, and changes in personality. A clinical diagnosis of probable AD can
  be made based on clinical signs and neuroimaging, and the diagnosis is confirmed postmortem based on neuropathologic findings. The
  e4 allele of the APOE gene has been widely demonstrated to be associated with increased risk of AD. In individuals with a clinical
  diagnosis of AD, the presence of the e4 allele increases the likelihood that the diagnosis is correct, but is not diagnostic alone. APOE
  genotyping is not recommended for predicting AD risk in asymptomatic individuals.
  Prevalence of APOE e4: Heterozygosity and homozygosity for the e4 allele is present in approximately 25 percent and 1-2 percent of
  the general population, respectively.
  Inheritance of APOE e4: Semi-dominant.
  Penetrance of APOE e4: Incomplete and influenced by age, gender, ethnicity, family history and environmental factors. The e4 allele is
  neither necessary nor sufficient for diagnosing AD; therefore, not all individuals with AD have the e4 allele and not all individuals with the
  e4 allele will develop AD.
  Cause: Multi-factorial.
  Variants Tested: Two single nucleotide polymorphisms in the APOE gene at codons 130 (rs429358) and 176 (rs7412). The e3 allele
  (Cysteine at 130 and Arginine at 176) is the most common in the general population. The e4 allele (Arginine at 130 and 176) is
  associated with increased AD risk. The e2 allele (Cysteine at codons 130 and 176) may be associated with a lower risk for AD but
  homozygosity has been associated with increased risk for type III hyperlipoproteinemia.
  Clinical Sensitivity: Approximately 30-60 percent of individuals diagnosed with AD carry at least one e4 allele. The e4/e4 genotype is
  found in approximately 13 percent of the AD population and 20 percent of the familial AD population.
  Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring using hybridization probes.
  Analytical Sensitivity and Specificity: 99 percent.
  Limitations: Only the APOE alleles e2, e3 and e4 will be detected; rare alleles are not detected by this test. Diagnostic errors can occur
  due to rare sequence variations.

ADMINISTRATIVE

CPT Codes:
  81401

COMPLETE VIEW

Ordering Recommendations:
Supports a clinical diagnosis of Alzheimer disease (AD) in symptomatic individuals. Use for AD risk assessment only. Genetic counseling and informed consent are strongly recommended prior to ordering and post test to discuss results.

**Test Code:**
- APOEZ

**ARUP Test Code:**
- 2013341

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon, Thu

**Methodology:**
- Polymerase Chain Reaction/Fluorescence Monitoring

**Remarks:**
- Testing of fetal specimens or specimens from patients under the age of 18 years is not offered.

**Collect:**
- Lavender (EDTA), Pink (K$_2$EDTA), or Yellow (ACD Solution A or B).

**Amount to Collect:**
- 3 mL

**Sample Type:**
- Whole blood

**Preferred Volume:**
- 3 mL

**Minimum Volume:**
- 1 mL

**Unacceptable Conditions:**
- Plasma or serum. Heparinized specimens.

**Specimen Preparation:**
- Transport 3 mL whole blood. (Min: 1 mL)

**Additional Processing Instructions:**
- Do not aliquot. Send sample refrigerated to CB. Order ARUP test code 2013341.

**Reference Interval:**
- Homozygous apo e3 (e3/e3): This genotype is the most common (normal) genotype.

**Interpretive Data:**

Background Information for Apolipoprotein E (APOE) Genotyping, Alzheimer Disease Risk
Characteristics: Alzheimer disease (AD), the most common cause of dementia, is characterized by progressive cognitive decline including memory, problem-solving skills, multi-step tasks, planning, and changes in personality. A clinical diagnosis of probable AD can be made based on clinical signs and neuroimaging, and the diagnosis is confirmed postmortem based on neuropathologic findings. The e4 allele of the APOE gene has been widely demonstrated to be associated with increased risk of AD. In individuals with a clinical diagnosis of AD, the presence of the e4 allele increases the likelihood that the diagnosis is correct, but is not diagnostic alone. APOE genotyping is not recommended for predicting AD risk in asymptomatic individuals.

Prevalence of APOE e4: Heterozygosity and homozygosity for the e4 allele is present in approximately 25 percent and 1-2 percent of the general population, respectively.

Inheritance of APOE e4: Semi-dominant.

Penetrance of APOE e4: Incomplete and influenced by age, gender, ethnicity, family history and environmental factors. The e4 allele is neither necessary nor sufficient for diagnosing AD; therefore, not all individuals with AD have the e4 allele and not all individuals with the e4 allele will develop AD.

Cause: Multi-factorial.

Variants Tested: Two single nucleotide polymorphisms in the APOE gene at codons 130 (rs429358) and 176 (rs7412). The e3 allele (Cysteine at 130 and Arginine at 176) is the most common in the general population. The e4 allele (Arginine at 130 and 176) is associated with increased AD risk. The e2 allele (Cysteine at codons 130 and 176) may be associated with a lower risk for AD but homozygosity has been associated with increased risk for type III hyperlipoproteinemia.

Clinical Sensitivity: Approximately 30-60 percent of individuals diagnosed with AD carry at least one e4 allele. The e4/e4 genotype is found in approximately 13 percent of the AD population and 20 percent of the familial AD population.

Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring using hybridization probes.

Analytical Sensitivity and Specificity: 99 percent.

Limitations: Only the APOE alleles e2, e3 and e4 will be detected; rare alleles are not detected by this test. Diagnostic errors can occur.
due to rare sequence variations.

**Synonyms:**
- Alzheimer's
- Alzheimer's
- Alzheimers
- APOE
- ApoE 2 mutations
- ApoE Alzheimer Risk
- ApoLipoprotein E Genotype

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month.

**Reported:**
2-7 days

**CPT Codes:**
81401
Apolipoprotein E (APOE) Genotyping, Cardiovascular Risk

ORDERING

Ordering Recommendations:
- Provide supporting evidence for a diagnosis of type III hyperlipoproteinemia for evaluation of premature coronary heart disease.

Performing Lab:
- ARUP

Performed:
- Mon, Thu

Methodology:
- Polymerase Chain Reaction/Fluorescence Monitoring

Reported:
- 2-7 days

Synonyms:
- APOE
- ApoE 2 mutations
- ApoE cardiac risk
- ApoLipoprotein E Genotype

COLLECTION

Sample Type:
- Whole blood

Collect:
- Lavender (EDTA), Pink (K$_2$EDTA), or Yellow (ACD Solution A or B).

Amount to Collect:
- 3 mL

Preferred Volume:
- 3 mL

Minimum Volume:
- 1 mL

Remarks:
- This test is not recommended for nonsymptomatic patients under 18 years of age.

Stability (from collection to initiation):
- Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Storage/Transport Temperature:
- Refrigerated.

Unacceptable Conditions:
- Plasma or serum. Heparinized specimens.

PROCESSING

Test Code:
- APOEC

ARUP Test Code:
- 2013337

Sendout:
- Yes

Performing Lab:
- ARUP
Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Additional Processing Instructions:
Do not aliquot specimen. Transport to CB refrigerated. Order ARUP test code 2013337.

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
Homozygous APOE e3 (e3/e3): This genotype is the most common (normal) genotype.

Interpretive Data:
Background Information for Apolipoprotein E (APOE) Genotyping, Cardiovascular Risk Characteristics: Hyperlipoproteinemia III (HPL III) is characterized by increased cholesterol and triglyceride levels, presence of B-VLDL, xanthomas, and premature vascular disease including coronary heart disease (CHD) and peripheral artery disease.
Incidence of HPL III: Approximately 1 in 5,000.
Inheritance of HPL III: Multifactorial; greater than 90 percent of affected individuals are homozygous for the e2 allele but other factors such as diabetes and hypothyroidism also play a large role in development of disease.
Penetration: 1 to 5 percent of individuals homozygous for the e2 will develop HPL III.
Cause: 2 copies of the e2 allele provides supporting evidence for a diagnosis of HPL III in a symptomatic individual but e2 homozygosity is neither necessary nor sufficient for HPL III.
Clinical Sensitivity: 90 percent of individuals with HPL III are homozygous for the e2 variant.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring using hybridization probes.
Analytical Sensitivity and Specificity: 99 percent.
Limitations: Only the e2, e3 and e4 variants will be detected. Rare isoforms of APOE will not be detected. If rare alleles are suspected, phenotyping by isoelectric focusing may be indicated. Diagnostic errors can occur due to rare sequence variations.

ADMINISTRATIVE

CPT Codes:
81401

COMPLETE VIEW

Ordering Recommendations:
Provide supporting evidence for a diagnosis of type III hyperlipoproteinemia for evaluation of premature coronary heart disease.

Test Code:
APOEC

ARUP Test Code:
2013337

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon, Thu
Methodology:
Polymerase Chain Reaction/Fluorescence Monitoring

Remarks:
This test is not recommended for nonsymptomatic patients under 18 years of age.

Collect:
Lavender (EDTA), Pink (K₂EDTA), or Yellow (ACD Solution A or B).

Amount to Collect:
3 mL

Sample Type:
Whole blood

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Additional Processing Instructions:
Do not aliquot specimen. Transport to CB refrigerated. Order ARUP test code 2013337.

Reference Interval:
Homozygous APOE e3 (e3/e3): This genotype is the most common (normal) genotype.

Interpretive Data:
Background Information for Apolipoprotein E (APOE) Genotyping, Cardiovascular Risk
Characteristics: Hyperlipoproteinemia III (HPL III) is characterized by increased cholesterol and triglyceride levels, presence of B-VLDL, xanthomas, and premature vascular disease including coronary heart disease (CHD) and peripheral artery disease.
Incidence of HPL III: Approximately 1 in 5,000.
Inheritance of HPL III: Multifactorial; greater than 90 percent of affected individuals are homozygous for the e2 allele but other factors such as diabetes and hypothyroidism also play a large role in development of disease.
Penetrance: 1 to 5 percent of individuals homozygous for the e2 will develop HPL III.
Cause: 2 copies of the e2 allele provides supporting evidence for a diagnosis of HPL III in a symptomatic individual but e2 homozygosity is neither necessary nor sufficient for HPL III.
Clinical Sensitivity: 90 percent of individuals with HPL III are homozygous for the e2 variant.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring using hybridization probes.
Analytical Sensitivity and Specificity: 99 percent.
Limitations: Only the e2, e3 and e4 variants will be detected. Rare isoforms of APOE will not be detected. If rare alleles are suspected, phenotyping by isoelectric focusing may be indicated. Diagnostic errors can occur due to rare sequence variations.

Synonyms:
- APOE
- ApoE 2 mutations
- ApoE cardiac risk
- ApoLipoprotein E Genotype

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Reported:
2-7 days

CPT Codes:
81401
Apt Test

APT

ORDERING

Approval Required:
Yes, contact Mission Bay Hematology at x6-0194

Available Stat:
No

Performing Lab:
Mission Bay Hematology

Performed:
Test available 24 hours per day 7 days per week

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
For identification of swallowed maternal blood. Performed on stool, gastric aspirate or vomitus from infants within 3 days of birth.

COLLECTION

Sample Type:
Visibly bloody (not tarry) specimen AND heparinized capillary tube of blood

Collect:
Clean container for stool aspirate or vomitus and heparinized capillary tube

PROCESSING

Test Code:
APT

Performing Lab:
Mission Bay Hematology

RESULT INTERPRETATION

Reference Interval:
Adult

Additional Information:
For identification of swallowed maternal blood. Performed on stool, gastric aspirate or vomitus from infants within 3 days of birth.

ADMINISTRATIVE

CPT Codes:
83033

LOINC Codes:
40721-3

COMPLETE VIEW

Approval Required:
Yes, contact Mission Bay Hematology at x6-0194

Available Stat:
No

Test Code:
Performing Lab: Mission Bay Hematology

Performed: Test available 24 hours per day 7 days per week

Collect: Clean container for stool aspirate or vomitus and heparinized capillary tube

Sample Type: Visibly bloody (not tarry) specimen AND heparinized capillary tube of blood

Reference Interval: Adult

Reported: STAT 1 hour, Routine 4 hours

Additional Information: For identification of swallowed maternal blood. Performed on stool, gastric aspirate or vomitus from infants within 3 days of birth.

CPT Codes:

83033

LOINC Codes:

40721-3
Argatroban Assay
ARGA

ORDERING

Approval Required:
No, except for testing outside of stated test availability, contact Hematology at x31747

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Monday - Friday 0800-1600. Approval required for testing outside of these hours.

Methodology:
Mechanical clot detection assay

Reported:
1-3 days

Additional Information:

The information contained herein is applicable to patients receiving argatroban in the setting of heparin induced thrombocytopenia. If argatroban is being utilized in other settings, including percutaneous coronary interventions, it is suggested that the Hematology Consultation service (pager: 443-4276) and a physician in the coagulation laboratory (353-1747) be contacted.

Argatroban is usually monitored by the activated PTT. Rarely, however, plasma argatroban levels should be measured to give a more accurate estimate of clinical anticoagulation.

Lupus anticoagulants can prolong the PTT at baseline, or impact the PTT after a patient has begun heparin therapy. If a patient being treated with argatroban is known or suspected to have a lupus anticoagulant, an argatroban level and an aPTT should be sent simultaneously. If review of results of simultaneous argatroban and PTT measurements indicates that the patient’s lupus anticoagulant is causing an artifactual PTT prolongation, subsequent monitoring with argatroban levels is indicated.

The manufacturer of argatroban, GlaxoSmithKline, provides complete prescribing information on its website: http://www.argatroban.com/argatroban_indications.htm, including information on the association of plasma argatroban levels and the activated PTT. A portion of the relevant information from this March 2009 document is summarized in the following information:

"Laboratory Tests: Anticoagulation effects associated with Argatroban infusion at doses up to 40 mcg/kg/min correlate with increases of the activated partial thromboplastin time (aPTT)."

"Dosage Adjustment: After the initial dose of Argatroban, the dose can be adjusted as clinically indicated (not to exceed 10 mcg/kg/min), until the steady-state aPTT is 1.5 to 3 times the initial baseline value (not to exceed 100 seconds)"

Patients for whom a lupus anticoagulant influences the PTT must be monitored with argatroban levels. Therapeutic levels are not recommended by the manufacturer, but the manufacturer does provide a graph that shows a relationship among representative PTT levels, ACT levels, infusion rates, and plasma Argatroban levels:

In the graph, a 0.4 microgram/mL argatroban level corresponded to approximately 1.6x the baseline PTT whereas a 2.0 microgram/mL argatroban level corresponded to approximately 2.6x the baseline PTT.

At UCSF we have assessed the sensitivity of our current PTT reagent to argatroban in July 2017. In plasma calibrators containing argatroban, we observed that 0.54 microgram/mL argatroban resulted in a PTT 1.7x baseline, 1.03 microgram/mL resulted in a PTT 2.1x baseline, 1.49 microgram/mL resulted in a PTT 2.4x baseline, and 1.88 microgram/mL resulted in a PTT 2.6x baseline. These results are generally similar to the information provided by the manufacturer and to the results of prior UCSF ex vivo spiking studies (performed in January 2006, March 2006, June 2009, January 2013, and June 2016).

On the basis of the information available, argatroban levels of 0.5-2.0 micrograms/mL can be considered therapeutic. These levels corresponded to 1.5x-2.7x baseline PTT in plasma without a lupus anticoagulant, which is within the manufacturer's recommended therapeutic PTT of 1.5x-3.0x patient baseline.

For adult patients without lupus anticoagulants an argatroban order form is available and should be utilized. The therapeutic PTT as of August 2017 was 52-67.9 seconds. For patients in whom the PTT cannot be used for monitoring, a derivative algorithm, based on a
therapeutic target of 0.5-2.0 micrograms/mL, should be used for monitoring and dose adjustment, as clinically indicated. It is suggested that the Hematology Consultation service (415-443-4276) be contacted for recommendations regarding an appropriate algorithm for monitoring and dose adjustment in these patients.

The presence of heparin will interfere with the argatroban assay and can produce an erroneously elevated argatroban test result.

Synonyms:
- Direct thrombin inhibitor

**COLLECTION**

**Sample Type:**
- Citrated plasma

**Collect:**
- Blue top filled to full extent of vacuum

**Amount to Collect:**
- 2.7 mL blood

**Preferred Volume:**
- 1.0 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Remarks:**
1. Peripheral stick required as heparin will interfere with the test.
2. Collect 1 blue top filled to full extent of vacuum (2.7 mL blood). Check the expiration date on the label of the blue top vacutainer before drawing the patient.
3. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
4. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
5. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
6. For patients with Hct’s >= 55%, please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Stability (from collection to initiation):**
- 4 hours

**Unacceptable Conditions:**
- QNS, hemolyzed or clotted sample.

**PROCESSING**

**Test Code:**
- ARGA

**Performing Lab:**
- Parnassus Hematology

**Specimen Preparation:**
- Deliver sample immediately to Hematology for processing

**Preferred Volume:**
- 1.0 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
QNS, hemolyzed or clotted sample.

**Stability (from collection to initiation):**

4 hours

## RESULT INTERPRETATION

**Units:**

µg/mL (mcg/mL)

**Reference Interval:**

Therapeutic anticoagulation: 0.5-2.0 µg/mL (mcg/mL)

Note: these values may not be applicable to intra-operative anticoagulation. See ‘Additional information’

**Critical Values:**

> 2.0 µg/mL

**Additional Information:**

The information contained herein is applicable to patients receiving argatroban in the setting of heparin induced thrombocytopenia. If argatroban is being utilized in other settings, including percutaneous coronary interventions, it is suggested that the Hematology Consultation service (pager: 443-4276) and a physician in the coagulation laboratory (353-1747) be contacted.

Argatroban is usually monitored by the activated PTT. Rarely, however, plasma argatroban levels should be measured to give a more accurate estimate of clinical anticoagulation.

Lupus anticoagulants can prolong the PTT at baseline, or impact the PTT after a patient has begun heparin therapy. If a patient being treated with argatroban is known or suspected to have a lupus anticoagulant, an argatroban level and an aPTT should be sent simultaneously. If review of results of simultaneous argatroban and PTT measurements indicates that the patient's lupus anticoagulant is causing an artificial PTT prolongation, subsequent monitoring with argatroban levels is indicated.

The manufacturer of argatroban, GlaxoSmithKline, provides complete prescribing information on its website: [http://www.argatroban.com/argatroban_indications.htm](http://www.argatroban.com/argatroban_indications.htm), including information on the association of plasma argatroban levels and the activated PTT. A portion of the relevant information from this March 2009 document is summarized in the following information:

"Laboratory Tests: Anticoagulation effects associated with Argatroban infusion at doses up to 40 mcg/kg/min correlate with increases of the activated partial thromboplastin time (aPTT)."

"Dosage Adjustment: After the initial dose of Argatroban, the dose can be adjusted as clinically indicated (not to exceed 10 mcg/kg/min), until the steady-state aPTT is 1.5 to 3 times the initial baseline value (not to exceed 100 seconds)"

Patients for whom a lupus anticoagulant influences the PTT must be monitored with argatroban levels. Therapeutic levels are not recommended by the manufacturer, but the manufacturer does provide a graph that shows a relationship among representative PTT levels, ACT levels, infusion rates, and plasma Argatroban levels:

In the graph, a 0.4 microgram/mL argatroban level corresponded to approximately 1.6x the baseline PTT whereas a 2.0 microgram/mL argatroban level corresponded to approximately 2.6x the baseline PTT.

At UCSF we have assessed the sensitivity of our current PTT reagent to argatroban in July 2017. In plasma calibrators containing argatroban, we observed that 0.54 microgram/mL argatroban resulted in a PTT 1.7x baseline, 1.03 microgram/mL resulted in a PTT 2.1x baseline, 1.49 microgram/mL resulted in a PTT 2.4x baseline, and 1.88 microgram/mL resulted in a PTT 2.6x baseline. These results are generally similar to the information provided by the manufacturer and to the results of prior UCSF ex vivo spiking studies (performed in January 2006, March 2006, June 2009, January 2013, and June 2016).

On the basis of the information available, argatroban levels of 0.5-2.0 micrograms/mL can be considered therapeutic. These levels corresponded to 1.5x-2.7x baseline PTT in plasma without a lupus anticoagulant, which is within the manufacturer's recommended therapeutic PTT of 1.5x-3.0x patient baseline.

For adult patients without lupus anticoagulants an argatroban order form is available and should be utilized. The therapeutic PTT as of August 2017 was 52-67.9 seconds. For patients in whom the PTT cannot be used for monitoring, a derivative algorithm, based on a therapeutic target of 0.5-2.0 micrograms/mL, should be used for monitoring and dose adjustment, as clinically indicated. It is suggested that the Hematology Consultation service (415-443-4276) be contacted for recommendations regarding an appropriate algorithm for monitoring and dose adjustment in these patients.
The presence of heparin will interfere with the argatroban assay and can produce an erroneously elevated argatroban test result.

**ADMINISTRATIVE**

**CPT Codes:**
- 85130

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Approval Required:**
- No, except for testing outside of stated test availability, contact Hematology at x31747

**Available Stat:**
- No

**Test Code:**
- ARGA

**Performing Lab:**
- Parnassus Hematology

**Performed:**
- Monday - Friday 0800-1600. Approval required for testing outside of these hours.

**Methodology:**
- Mechanical clot detection assay

**Remarks:**
1. Peripheral stick required as heparin will interfere with the test.

2. Collect 1 blue top filled to full extent of vacuum (2.7 mL blood). Check the expiration date on the label of the blue top vacutainer before drawing the patient.

3. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.

4. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.

5. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

6. For patients with Hct’s >= 55%, please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Collect:**
- Blue top filled to full extent of vacuum

**Amount to Collect:**
- 2.7 mL blood

**Sample Type:**
- Citrated plasma

**Preferred Volume:**
- 1.0 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- QNS, hemolyzed or clotted sample.

**Specimen Preparation:**
- Deliver sample immediately to Hematology for processing

**Units:**
µg/mL (mcg/mL)

Reference Interval:
Therapeutic anticoagulation: 0.5-2.0 µg/mL (mcg/mL)

Note: these values may not be applicable to intra-operative anticoagulation. See 'Additional information'

Critical Values:
> 2.0 µg/mL

Synonyms:
- Direct thrombin inhibitor

Stability (from collection to initiation):
4 hours

Reported:
1-3 days

Additional Information:

The information contained herein is applicable to patients receiving argatroban in the setting of heparin induced thrombocytopenia. If argatroban is being utilized in other settings, including percutaneous coronary interventions, it is suggested that the Hematology Consultation service (pager: 443-4276) and a physician in the coagulation laboratory (353-1747) be contacted.

Argatroban is usually monitored by the activated PTT. Rarely, however, plasma argatroban levels should be measured to give a more accurate estimate of clinical anticoagulation.

Lupus anticoagulants can prolong the PTT at baseline, or impact the PTT after a patient has begun heparin therapy. If a patient being treated with argatroban is known or suspected to have a lupus anticoagulant, an argatroban level and an aPTT should be sent simultaneously. If review of results of simultaneous argatroban and PTT measurements indicates that the patient's lupus anticoagulant is causing an artifactual PTT prolongation, subsequent monitoring with argatroban levels is indicated.

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"Dosage Adjustment: After the initial dose of Argatroban, the dose can be adjusted as clinically indicated (not to exceed 10 mcg/kg/min), until the steady-state aPTT is 1.5 to 3 times the initial baseline value (not to exceed 100 seconds)"

Patients for whom a lupus anticoagulant influences the PTT must be monitored with argatroban levels. Therapeutic levels are not recommended by the manufacturer, but the manufacturer does provide a graph that shows a relationship among representative PTT levels, ACT levels, infusion rates, and plasma Argatroban levels:

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On the basis of the information available, argatroban levels of 0.5-2.0 micrograms/mL can be considered therapeutic. These levels corresponded to 1.5x-2.7x baseline PTT in plasma without a lupus anticoagulant, which is within the manufacturer's recommended therapeutic PTT of 1.5x-3.0x patient baseline.

For adult patients without lupus anticoagulants an argatroban order form is available and should be utilized. The therapeutic PTT as of August 2017 was 52-67.9 seconds. For patients in whom the PTT cannot be used for monitoring, a derivative algorithm, based on a therapeutic target of 0.5-2.0 micrograms/mL, should be used for monitoring and dose adjustment, as clinically indicated. It is suggested that the Hematology Consultation service (415-443-4276) be contacted for recommendations regarding an appropriate algorithm for monitoring and dose adjustment in these patients.

The presence of heparin will interfere with the argatroban assay and can produce an erroneously elevated argatroban test result.
CPT Codes:
   85130
LDT or Modified FDA:
   Yes
Arginine Vasopressin Hormone
AVP

ORDERING

Performing Lab:
ARUP

Performed:
Mon, Wed, Fri

Methodology:
Quantitative Radioimmunoassay

Reported:
3-11 days

Synonyms:
- ADH
- Arginine vasopressin
- AVP
- ADH, Plasma
- Antidiuretic Hormone
- Antidiuretic Hormone, Plasma
- Arginine Vasopressin, Plasma
- AVH, Plasma
- Diabetes Insipidus
- SIADH
- Vasopressin
- Vasopressin/ADH

COLLECTION

Sample Type:
EDTA Plasma

Collect:
Lavender (EDTA) or pink (K$_2$EDTA).

Amount to Collect:
12 mL blood

Preferred Volume:
6 mL plasma

Minimum Volume:
2.5 mL plasma

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 1 month

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Non-frozen specimens.

PROCESSING

Test Code:
AVP
ARUP Test Code: 0070027
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation:
Separate plasma from cells ASAP or within 2 hours of collection. Transfer 6 mL plasma to ARUP Standard Transport Tubes and freeze immediately. (Min: 2.5 mL)
Preferred Volume:
6 mL plasma
Minimum Volume:
2.5 mL plasma
Unacceptable Conditions:
Non-frozen specimens.
Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 1 month
Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
Effective May 21, 2012
0.0-6.9 pg/mL

ADMINISTRATIVE

CPT Codes:
84588
LOINC:
• 3126-0

COMPLETE VIEW

Test Code:
AVP
ARUP Test Code: 0070027
Performing Lab: ARUP
Sendout: Yes
Performed:
Mon, Wed, Fri
Methodology:
Quantitative Radioimmunoassay
Collect:
Lavender (EDTA) or pink (K$_2$EDTA).
Amount to Collect:
12 mL blood
Sample Type:
EDTA Plasma
Preferred Volume:
6 mL plasma

**Minimum Volume:**
2.5 mL plasma

**Unacceptable Conditions:**
Non-frozen specimens.

**Specimen Preparation:**
Separate plasma from cells ASAP or within 2 hours of collection. Transfer 6 mL plasma to ARUP Standard Transport Tubes and freeze immediately. (Min: 2.5 mL)

**Reference Interval:**
Effective May 21, 2012
0.0-6.9 pg/mL

**Synonyms:**
- ADH
- Arginine vasopressin
- AVP
- ADH, Plasma
- Antidiuretic Hormone
- Antidiuretic Hormone, Plasma
- Arginine Vasopressin, Plasma
- AVH, Plasma
- Diabetes Insipidus
- SIADH
- Vasopressin
- Vasopressin/ADH

**Storage/Transport Temperature:**
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 1 month

**Reported:**
3-11 days

**CPT Codes:**
84588

**LOINC:**
- 3126-0
Arsenic, 24 hour urine

ORDERING

Available Stat: 
No
Performing Lab: 
Quest
Methodology: 
ICP/MS
Reported: 
Test run Tuesday-Saturday. Turnaround: 2-5 days.
Additional Information: 
To convert µg/L to µmol/L (SI units) multiply by 0.0133.

Synonyms:
• As
• AS

COLLECTION

Patient Preparation: 
The patient should not eat crab, lobster, shellfish, shrimp or bottom-feeders such as flounder for at least 3 days prior to specimen collection.
Sample Type: 
24 hour urine collection
Collect: 
Acid washed 24 hour urine collection container
Amount to Collect: 
Entire 24 hour urine output
Preferred Volume: 
10 mL urine
Minimum Volume: 
5 mL urine

PROCESSING

Test Code: 
ASU
Test Group: 
Arsenic
Sendout: 
Yes
Performing Lab: 
Quest
Specimen Preparation: 
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate 10 mL aliquot. Order Quest # 3087N
Preferred Volume: 
10 mL urine
Minimum Volume: 
5 mL urine

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:

µg/L (mcg/L)

Reference Interval:

<81 µg/L (Varies w/diet)

Additional Information:

To convert µg/L to µmol/L (SI units) multiply by 0.0133.

ADMINISTRATIVE

CPT Codes:

82175-90

LOINC Codes:

21074-0

COMPLETE VIEW

Available Stat:

No

Test Code:

ASU

Test Group:

Arsenic

Performing Lab:

Quest

Sendout:

Yes

Methodology:

ICP/MS

Patient Preparation:

The patient should not eat crab, lobster, shellfish, shrimp or bottom-feeders such as flounder for at least 3 days prior to specimen collection.

Collect:

Acid washed 24 hour urine collection container

Amount to Collect:

Entire 24 hour urine output

Sample Type:

24 hour urine collection

Preferred Volume:

10 mL urine

Minimum Volume:

5 mL urine

Specimen Preparation:

Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate 10 mL aliquot. Order Quest # 3087N

Units:

µg/L (mcg/L)

Reference Interval:

<81 µg/L (Varies w/diet)

Synonyms:

- As
- AS

Reported:

Test run Tuesday-Saturday. Turnaround: 2-5 days.

Additional Information:

To convert µg/L to µmol/L (SI units) multiply by 0.0133.
CPT Codes:
   82175-90
LOINC Codes:
   21074-0
Arsenic, blood
ASB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively coupled Plasma Mass Spectroscopy
Reported:
Test run Tuesday-Thursday. Turnaround: 2-7 days.
Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.0133.
Synonyms:
• As
• AS
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

COLLECTION

Patient Preparation:
Patient should refrain from eating seafood and taking herbal supplements at least 3 days prior to sample collection.
Sample Type:
EDTA whole blood
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
4 mL blood
Preferred Volume:
4 mL blood
Minimum Volume:
2 mL blood
Remarks:
To avoid contamination use powderless gloves during collection. Mix well, inverting gently 5x.
Stability (from collection to initiation):
Room temp or refrigerated: 10 days

PROCESSING

Test Code:
ASB
Test Group:
Arsenic
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Do not centrifuge or transfer to another container. Refrigerate.
Order Quest # 269X

Preferred Volume:
4 mL blood

Minimum Volume:
2 mL blood

Stability (from collection to initiation):
Room temp or refrigerated: 10 days

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
<= 60 µg/L

Critical Values:
Quest Priority-2: > 60 µg/L

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.0133.

ADMINISTRATIVE

CPT Codes:
82175-90

LOINC Codes:
5583-0

COMPLETE VIEW

Available Stat:
No

Test Code:
ASB

Test Group:
Arsenic

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively coupled Plasma Mass Spectroscopy

Patient Preparation:
Patient should refrain from eating seafood and taking herbal supplements at least 3 days prior to sample collection.

Remarks:
To avoid contamination use powderless gloves during collection. Mix well, inverting gently 5x.

Collect:
Navy blue top (EDTA) tube

Amount to Collect:
4 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
4 mL blood

Minimum Volume:
2 mL blood
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Do not centrifuge or transfer to another container. Refrigerate. Order Quest # 269X

Units:
µg/L (mcg/L)

Reference Interval:
<= 60 µg/L

Critical Values:
Quest Priority-2: > 60 µg/L

Synonyms:
• As
• AS
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

Stability (from collection to initiation):
Room temp or refrigerated: 10 days

Reported:
Test run Tuesday-Thursday. Turnaround: 2-7 days.

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.0133.

CPT Codes:
82175-90

LOINC Codes:
5583-0
Arsenic, random urine
ASUR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively-Coupled Plasma Mass Spectroscopy
Reported:
Performed 5x per week. Turnaround 6-10 days
Synonyms:
- As
- AS

COLLECTION

Patient Preparation:
The patient should not eat crab, lobster, shellfish, shrimp or bottom-feeders such as flounder for at least 3 days prior to specimen collection.
Sample Type:
Random urine (second AM void preferred)
Collect:
Urine cup
Amount to Collect:
7 mL urine
Preferred Volume:
7 mL urine
Minimum Volume:
3.5 mL urine
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks

PROCESSING

Test Code:
ASUR
Test Group:
Arsenic
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate aliquot. Order Quest test # 84913N
Preferred Volume:
7 mL urine
Minimum Volume:
3.5 mL urine
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks
RESULT INTERPRETATION

Units:
µg/g creatinine

Reference Interval:
Non-exposed >= 18 year old: <= 50 µg/g creatinine

ADMINISTRATIVE

CPT Codes:
82175-90, 82570-90

LOINC Codes:
13463-5

COMPLETE VIEW

Available Stat:
No

Test Code:
ASUR

Test Group:
Arsenic

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively-Coupled Plasma Mass Spectroscopy

Patient Preparation:
The patient should not eat crab, lobster, shellfish, shrimp or bottom-feeders such as flounder for at least 3 days prior to specimen collection.

Collect:
Urine cup

Amount to Collect:
7 mL urine

Sample Type:
Random urine (second AM void preferred)

Preferred Volume:
7 mL urine

Minimum Volume:
3.5 mL urine

Specimen Preparation:
Refrigerate aliquot. Order Quest test # 84913N

Units:
µg/g creatinine

Reference Interval:
Non-exposed >= 18 year old: <= 50 µg/g creatinine

Synonyms:
• As
• AS

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks

Reported:
Performed 5x per week. Turnaround 6-10 days
CPT Codes:
   82175-90, 82570-90
LOINC Codes:
   13463-5
ARU Test Aspirin Reaction

ORDERING

Approval Required:
No, but must contact Hematology at x3-1747 to receive collection kit. For Neurointerventional radiology only.

Performing Lab:
Hematology, Parnassus

Performed:
Monday - Friday 0800 - 1600
Saturday - Sunday 0800 - 1545

Methodology:
VerifyNow System

Reported:
4 hours

Additional Information:
The VerifyNow Aspirin Test is designed to measure aspirin's expected antiplatelet effect.

Plavix®, Ticlid®, and Effient® are commonly prescribed in conjunction with aspirin. While infrequent, these agents may cause a reduction of ARU in some patients.

Test performance was not affected by hematocrit values between 29-56%, platelet count values of >= 92,000/µL or moderate to extensive blood hemolysis induced by physical manipulation. Based on an in-house study performed on 3/29/16, correlation showed that as platelet count increased, ARU results increased.

According to manufacturer:
>= 550 ARU - Platelet dysfunction consistent with aspirin has not been detected
<550 ARU - Platelet dysfunction consistent with aspirin has been detected

Results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

Synonyms:
- Aspirin Reaction

COLLECTION

Sample Type:
Citrated and EDTA anticoagulated whole blood

Collect:
1. Greiner partial fill discard
2. Greiner partial fill 3.2% Sodium citrate blue top
3. Lavender EDTA tube

Amount to Collect:
8 mL

Preferred Volume:
8 mL

Minimum Volume:
6 mL

Remarks:
Contact Hematology at x3-1747 for collection kits. DO NOT collect any specimens before 0800 or after 1600 from Monday to Friday; before 0800 or after 1545 on Saturday and Sunday.

1. Whole blood samples must be collected in or immediately transferred to Greiner 2.0 mL partial fill blue top tubes containing 3.2% Sodium Citrate. The tube must be filled to its intended whole blood capacity (indicated by small black line).
2. Whole blood may be collected from venous sites using a 21 gauge or larger needle in an appropriate blood collection tube.
3. Blood samples should be obtained from an extremity free of peripheral venous infusions.
4. Collect a discard tube first (approximately 2 mL), Greiner partial fill blue tops 2nd, and a lavender for CBC last.
5. Gently invert the sample tube at least 5 times to ensure complete mixing of the contents.
6. Blood must set a minimum of 10 minutes after collection before testing but no longer than 4 hours.

Samples cannot be pneumatic tubed.

**Stability (from collection to initiation):**

4 hours

**Unacceptable Conditions:**

- Clotted samples or if stability period exceeded.
- Incorrect tube type and/or no discard tube received.
- Patients with Hct's < 33% and/or Plt's < 119

**PROCESSING**

**Test Code:**

ARU

**Performing Lab:**

Hematology, Parnassus

**Specimen Preparation:**

Deliver immediately to Hematology

**Additional Processing Instructions:**

An ARU will be ordered in computer. If no CBC or CBCD is requested, Central Processing will order a hematocrit (HCT) and platelet count (PLT).

**Preferred Volume:**

8 mL

**Minimum Volume:**

6 mL

**Unacceptable Conditions:**

- Clotted samples or if stability period exceeded.
- Incorrect tube type and/or no discard tube received.
- Patients with Hct's < 33% and/or Plt's < 119

**Stability (from collection to initiation):**

4 hours

**RESULT INTERPRETATION**

**Units:**

ARU

**Reference Interval:**

620 - 672

**Additional Information:**

The VerifyNow Aspirin Test is designed to measure aspirin's expected antiplatelet effect.

Plavix®, Ticlid®, and Effient® are commonly prescribed in conjunction with aspirin. While infrequent, these agents may cause a reduction of ARU in some patients.

Test performance was not affected by hematocrit values between 29-56%, platelet count values of >= 92,000/µL or moderate to extensive blood hemolysis induced by physical manipulation. Based on an in-house study performed on 3/29/16, correlation showed that as platelet count increased, ARU results increased.

According to manufacturer:

- >= 550 ARU - Platelet dysfunction consistent with aspirin has not been detected
- <550 ARU - Platelet dysfunction consistent with aspirin has been detected
Results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

**ADMINISTRATIVE**

**CPT Codes:**
85576

**LOINC Codes:**
49011-0

**COMPLETE VIEW**

**Approval Required:**
No, but must contact Hematology at x3-1747 to receive collection kit. For Neurointerventional radiology only.

**Test Code:**
ARU

**Performing Lab:**
Hematology, Parnassus

**Performed:**
Monday - Friday 0800 - 1600  
Saturday - Sunday 0800 - 1545

**Methodology:**
VerifyNow System

**Remarks:**
Contact Hematology at x3-1747 for collection kits. DO NOT collect any specimens before 0800 or after 1600 from Monday to Friday; before 0800 or after 1545 on Saturday and Sunday.

1. Whole blood samples must be collected in or immediately transferred to Greiner 2.0 mL partial fill blue top tubes containing 3.2% Sodium Citrate. The tube must be filled to its intended whole blood capacity (indicated by small black line).
2. Whole blood may be collected from venous sites using a 21 gauge or larger needle in an appropriate blood collection tube.
3. Blood samples should be obtained from an extremity free of peripheral venous infusions.
4. Collect a discard tube first (approximately 2 mL), Greiner partial fill blue tops 2nd, and a lavender for CBC last.
5. Gently invert the sample tube at least 5 times to ensure complete mixing of the contents.
6. Blood must set a minimum of 10 minutes after collection before testing but no longer than 4 hours.

Samples cannot be pneumatic tubed.

**Collect:**
1. Greiner partial fill discard
2. Greiner partial fill 3.2% Sodium citrate blue top
3. Lavender EDTA tube

**Amount to Collect:**
8 mL

**Sample Type:**
Citrated and EDTA anticoagulated whole blood

**Preferred Volume:**
8 mL

**Minimum Volume:**
6 mL

**Unacceptable Conditions:**
Clotted samples or if stability period exceeded.
Incorrect tube type and/or no discard tube received.
Patients with Hct's < 33% and/or Plt's < 119

**Specimen Preparation:**
Deliver immediately to Hematology

**Additional Processing Instructions:**
An ARU will be ordered in computer. If no CBC or CBCD is requested, Central Processing will order a hematocrit (HCT) and platelet count (PLT).
Units:
    ARU
Reference Interval:
    620 - 672
Synonyms:
    • Aspirin Reaction
Stability (from collection to initiation):
    4 hours
Reported:
    4 hours
Additional Information:
    The VerifyNow Aspirin Test is designed to measure aspirin's expected antiplatelet effect.

    Plavix®, Ticlid®, and Effient® are commonly prescribed in conjunction with aspirin. While infrequent, these agents may cause a reduction of ARU in some patients.

    Test performance was not affected by hematocrit values between 29-56%, platelet count values of >= 92,000/µL or moderate to extensive blood hemolysis induced by physical manipulation. Based on an in-house study performed on 3/29/16, correlation showed that as platelet count increased, ARU results increased.

    According to manufacturer:
    >= 550 ARU - Platelet dysfunction consistent with aspirin has not been detected

    <550 ARU - Platelet dysfunction consistent with aspirin has been detected

    Results should be interpreted in conjunction with other laboratory and clinical data available to the clinician.

CPT Codes:
    85576
LOINC Codes:
    49011-0
Arylsulfatase A

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Enzymatic
Reported: Test run Tuesday & Thursday. Results available 2-4 days after set-up.

Additional Information:
Absence of the enzyme Arylsulfatase A results in an accumulation in the cells of cerebroside sulfate (a toxic substance) which causes the disease metachromatic leukocystrophy (MLD). MLD is a lysosomal storage disorder disease in which the patient lacks a protein needed to metabolize ingested food. It is transmitted as an autosomal recessive trait and is characterized by a wide range of symptoms with both early and delayed onset forms. See also Lysosomal Disease.

Synonyms:
- Multiple sulfatase deficiency
- Sulfatase deficiency,multiple

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 20 mL urine
Minimum Volume: 8 mL urine
Stability (from collection to initiation): Refrigerated: 10 days
Rejection Criteria: Room temp or frozen sample

PROCESSING

Test Code: ASUL
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
- Refrigerate, DO NOT freeze. Order Quest #34694X.
Preferred Volume: 20 mL urine
Minimum Volume: 8 mL urine
Rejection Criteria:
RESULT INTERPRETATION

Units:
U/L
Reference Interval:
>2.4 U/L
Additional Information:
Absence of the enzyme Arylsulfatase A results in an accumulation in the cells of cerebroside sulfate (a toxic substance) which causes the disease metachromatic leukocystrophy (MLD). MLD is a lysosomal storage disorder disease in which the patient lacks a protein needed to metabolize ingested food. It is transmitted as an autosomal recessive trait and is characterized by a wide range of symptoms with both early and delayed onset forms. See also Lysosomal Disease.

ADMINISTRATIVE

CPT Codes:
84311-90
LOINC Codes:
2061-0

COMPLETE VIEW

Available Stat:
No
Test Code:
ASUL
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzymatic
Collect:
Urine cup
Amount to Collect:
See preferred volume
Sample Type:
Random urine
Preferred Volume:
20 mL urine
Minimum Volume:
8 mL urine
Rejection Criteria:
Room temp or frozen sample
Specimen Preparation:
Refrigerate, DO NOT freeze. Order Quest #34694X.
Units:
U/L
Reference Interval:
>2.4 U/L
Synonyms:
• Multiple sulfatase deficiency
- Sulfatase deficiency, multiple

**Stability (from collection to initiation):**
- Refrigerated: 10 days

**Reported:**
- Test run Tuesday & Thursday. Results available 2-4 days after set-up.

**Additional Information:**
Absence of the enzyme Arylsulfatase A results in an accumulation in the cells of cerebroside sulfate (a toxic substance) which causes the disease metachromatic leukocystrophy (MLD). MLD is a lysosomal storage disorder disease in which the patient lacks a protein needed to metabolize ingested food. It is transmitted as an autosomal recessive trait and is characterized by a wide range of symptoms with both early and delayed onset forms. See also Lysosomal Disease.

**CPT Codes:**
- 84311-90

**LOINC Codes:**
- 2061-0
Ascaris lumbricoides eggs
P401

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Test performed Monday-Friday, 0800-1500 only.
Reported:
1-3 days
Additional Information:
Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.
Synonyms:
• O&P

COLLECTION

Sample Type:
Stool
Collect:
O&P vials
Unacceptable Conditions:
Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. More than one sample received within 24 hours.

PROCESSING

Test Code:
P401
Test Group:
Ascaris
Performing Lab:
Microbiology
Specimen Preparation:
Refrigerated unpreserved samples: 24 hours
SAF preserved samples at room temperature: indefinite
Unacceptable Conditions:
Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. More than one sample received within 24 hours.

RESULT INTERPRETATION

Additional Information:
Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.

ADMINISTRATIVE

CPT Codes:
87177; 88313; 87206
LOINC Codes:
10704-5

COMPLETE VIEW

Available Stat:
No

Test Code:
P401

Test Group:
Ascaris

Performing Lab:
Microbiology

Performed:
Test performed Monday-Friday, 0800-1500 only.

Collect:
O&P vials

Sample Type:
Stool

Unacceptable Conditions:
Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. More than one sample received within 24 hours.

Specimen Preparation:
Refrigerated unpreserved samples: 24 hours
SAF preserved samples at room temperature: indefinite

Synonyms:
• O&P

Reported:
1-3 days

Additional Information:
Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.

CPT Codes:
87177; 88313; 87206

LOINC Codes:
10704-5
Ascaris lumbricoides worm
P404

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Test performed Monday-Friday, 0800-1500 only.
Reported: 1-3 days
Additional Information: Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.
Synonyms: O&P

COLLECTION

Sample Type: Worm
Collect: Clean container with gauze moistened with water

PROCESSING

Test Code: P404
Performing Lab: Microbiology
Specimen Preparation: Refrigerated: 24 hours

RESULT INTERPRETATION

Additional Information: Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.

ADMINISTRATIVE

CPT Codes: 87169
LOINC Codes: 673-4

COMPLETE VIEW

Available Stat: No
Test Code: P404
Performing Lab:
  Microbiology

Performed:
  Test performed Monday-Friday, 0800-1500 only.

Collect:
  Clean container with gauze moistened with water

Sample Type:
  Worm

Specimen Preparation:
  Refrigerated: 24 hours

Synonyms:
  • O&P

Reported:
  1-3 days

Additional Information:
  Because of the large number of eggs produced, stool examination is generally the diagnostic method of choice. See Parasites-Sputum, Parasites-Stool, and Parasites-Worm Identification.

CPT Codes:
  87169

LOINC Codes:
  673-4
Ascorbic Acid
ASCA

**ORDERING**

Available Stat:  
No

Performing Lab:  
Quest

Methodology:  
Capillary electrophoresis

Reported:  
Set up 5x per week. Turnaround time: 3-5 days

Additional Information:  
Clinical use: assessment of nutritional status. To convert mg/dL to µmol/L (SI units) multiply by 56.78.

Vitamin C is an antioxidant involved in connective tissue metabolism, drug-metabolizing systems, and mixed-function oxidase systems to list a few. Vitamin C deficiency causes scurvy; manifestations include impaired formation of mature connective tissue, bleeding into the skin, weakness, fatigue, and depression.

Synonyms:  
- Ascorbate
- Vitamin C
- Vit. C
- Vit C

**COLLECTION**

Patient Preparation:  
An 8 hour fast before specimen collection is preferred. Patient should refrain from taking vitamin supplements 24 hours prior to collection.

Sample Type:  
Serum

Collect:  
Gold top

Amount to Collect:  
4 mL blood

Preferred Volume:  
2 mL serum

Minimum Volume:  
1 mL serum

Remarks:  
Wrap the tube in aluminum foil to protect it from light.

Stability (from collection to initiation):  
Frozen at -20C 10 days.

Rejection Criteria:  
Received at room temperature or refrigerated

**PROCESSING**

Test Code:  
ASCA

Sendout:  
Yes
Performing Lab:
    Quest

Specimen Preparation:
    Aliquot serum in dark pour-off vial. Freeze serum at -20C. Do not thaw frozen specimen. Order Quest # 19034P

Preferred Volume:
    2 mL serum

Minimum Volume:
    1 mL serum

Rejection Criteria:
    Received at room temperature or refrigerated

Stability (from collection to initiation):
    Frozen at -20C 10 days.

RESULT INTERPRETATION

Units:
    mg/dL

Reference Interval:
    0.20-1.90 mg/dL

Additional Information:
    Clinical use: assessment of nutritional status. To convert mg/dL to µmol/L (SI units) multiply by 56.78.
    Vitamin C is an antioxidant involved in connective tissue metabolism, drug-metabolizing systems, and mixed-function oxidase systems to list a few. Vitamin C deficiency causes scurvy; manifestations include impaired formation of mature connective tissue, bleeding into the skin, weakness, fatigue, and depression.

ADMINISTRATIVE

CPT Codes:
    82180-90

LOINC Codes:
    1903-4

COMPLETE VIEW

Available Stat:
    No

Test Code:
    ASCA

Performing Lab:
    Quest

Sendout:
    Yes

Methodology:
    Capillary electrophoresis

Patient Preparation:
    An 8 hour fast before specimen collection is preferred. Patient should refrain from taking vitamin supplements 24 hours prior to collection.

Remarks:
    Wrap the tube in aluminum foil to protect it from light.

Collect:
    Gold top

Amount to Collect:
    4 mL blood

Sample Type:
Serum

Preferred Volume:  
2 mL serum

Minimum Volume:  
1 mL serum

Rejection Criteria:  
Received at room temperature or refrigerated

Specimen Preparation:  
Aliquot serum in dark pour-off vial. Freeze serum at -20C. Do not thaw frozen specimen. Order Quest # 19034P

Units:  
mg/dL

Reference Interval:  
0.20-1.90 mg/dL

Synonyms:  
• Ascorbate  
• Vitamin C  
• Vit. C  
• Vit C

Stability (from collection to initiation):  
Frozen at -20C 10 days.

Reported:  
Set up 5x per week. Turnaround time: 3-5 days

Additional Information:  
Clinical use: assessment of nutritional status. To convert mg/dL to µmol/L (SI units) multiply by 56.78.

Vitamin C is an antioxidant involved in connective tissue metabolism, drug-metabolizing systems, and mixed-function oxidase systems to list a few. Vitamin C deficiency causes scurvy; manifestations include impaired formation of mature connective tissue, bleeding into the skin, weakness, fatigue, and depression.

CPT Codes:  
82180-90

LOINC Codes:  
1903-4
Aspartate transaminase, Plasma / Serum

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (non-activated alpha-ketoglutarate/NADH)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Hemolysis may artifactually increase the result.

Samples with AST levels above the upper limit of the assay will automatically be diluted and re-run.

Synonyms:
- SGOT
- AST
- GOT
- glutamic-oxaloacetic transaminase
- glutamic-aspartic transaminase
- transaminase A
- AAT
- AspT
- 2-oxoglutarate-glutamate aminotransferase
- aspartate alpha-ketoglutarate transaminase
- aspartate aminotransferase
- aspartate-2-oxoglutarate transaminase
- aspartic acid aminotransferase
- aspartic aminotransferase
- aspartyl aminotransferase
- glutamate-oxalacetate aminotransferase
- glutamate-oxalate transaminase
- glutamic-aspartic aminotransferase
- glutamic-oxalacetic transaminase
- glutamic oxalic transaminase
- GOT (enzyme)
- L-aspartate transaminase
- L-aspartate-alpha-ketoglutarate transaminase
- L-aspartate-2-ketoglutarate aminotransferase
- L-aspartate-2-oxoglutarate aminotransferase
- L-aspartate-2-oxoglutarate-transaminase
- L-aspartic aminotransferase

Test information subject to change.
- oxaloacetate-aspartate aminotransferase
- oxaloacetate transferase
- aspartate-2-oxoglutarate aminotransferase
- glutamate oxaloacetate transaminase

## COLLECTION

**Sample Type:**
Plasma or serum

**Collect:**
Light green top preferred, Gold top acceptable

**Amount to Collect:**
1 mL blood

**Prefered Volume:**
0.5 mL plasma or serum

**Minimum Volume:**
0.2 mL plasma or serum

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

## PROCESSING

**Test Code:**
AST

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Chemistry

**Preferred Volume:**
0.5 mL plasma or serum

**Minimum Volume:**
0.2 mL plasma or serum

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

## RESULT INTERPRETATION

**Units:**
U/L

**Reference Interval:**
- 0-7 days: 24-100
- 8-30 days: 20-72
- 1 month - 11 months: 13-65
- 1 year - 5 years: 18-63
- >= 6 years: 17-42

**Note:**
2. Normal range for 1 to 6 year old children adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
4. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

**Additional Information:**
Hemolysis may artifactually increase the result.
Samples with AST levels above the upper limit of the assay will automatically be diluted and re-run.

**ADMINISTRATIVE**

**CPT Codes:**
- 84450

**LOINC Codes:**
- 1920-8

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- AST

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Spectrophotometric, kinetic (non-activated alpha-ketoglutarate/NADH)

**Collect:**
- Light green top preferred, Gold top acceptable

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Plasma or serum

**Preferred Volume:**
- 0.5 mL plasma or serum

**Minimum Volume:**
- 0.2 mL plasma or serum

**Units:**
- U/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
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</tr>
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**Note:**
2. Normal range for 1 to 6 year old children adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
4. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

**Synonyms:**
- SGOT
- AST
- GOT
- glutamic-oxaloacetic transaminase
- glutamic-aspartic transaminase
- transaminase A
• AAT
• AspT
• 2-oxoglutarate-glutamate aminotransferase
• aspartate alpha-ketoglutarate transaminase
• aspartate aminotransferase
• aspartate-2-oxoglutarate transaminase
• aspartic acid aminotransferase
• aspartic aminotransferase
• aspartyl aminotransferase
• glutamate-oxalacetic transaminase
• glutamic-oxalacetic transaminase
• glutamic-oxalic transaminase
• GOT (enzyme)
• L-aspartate transaminase
• L-aspartate-alpha-ketoglutarate transaminase
• L-aspartate-2-ketoglutarate aminotransferase
• L-aspartate-2-oxoglutarate aminotransferase
• L-aspartate-2-oxoglutarate-transaminase
• L-aspartic aminotransferase
• oxaloacetate-aspartate aminotransferase
• oxaloacetate transferase
• aspartate:2-oxoglutarate aminotransferase
• glutamate oxaloacetate transaminase

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- Hemolysis may artifactually increase the result.
- Samples with AST levels above the upper limit of the assay will automatically be diluted and re-run.

**CPT Codes:**
- 84450

**LOINC Codes:**
- 1920-8
Aspergillus Antibodies
ASPG

ORDERING

Available Stat:
No
Performing Lab:
Quest
Reported:
Test performed Monday - Friday. Turnaround time: 3-5 days.
Additional Information:
Positive result indicates exposure to Aspergillus, and the possibility of hypersensitivity pneumonia. Includes testing against A. fumigatus, A. niger and A. flavus.
Synonyms:
• Aspergillus Precipitins

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
ASPG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 20341X.
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Positive result indicates exposure to Aspergillus, and the possibility of hypersensitivity pneumonia. Includes testing against A. fumigatus, A. niger and A. flavus.
CPT Codes:
86606-90
LOINC Codes:
5053-4

COMPLETE VIEW

Available Stat:
No
Test Code:
ASPG
Performing Lab:
Quest
Sendout:
Yes
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Refrigerate. Order Quest # 20341X.
Reference Interval:
Negative
Synonyms:
• Aspergillus Precipitins
 Reported:
Test performed Monday - Friday. Turnaround time: 3-5 days.
Additional Information:
Positive result indicates exposure to Aspergillus, and the possibility of hypersensitivity pneumonia. Includes testing against A. fumigatus, A. niger and A. flavus.
CPT Codes:
86606-90
LOINC Codes:
5053-4
Aspergillus Culture
P259A

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Set up daily, day and evening shifts
Additional Information: Preferable when Aspergillus species are the only fungal pathogen of concern. A separate culture for Aspergillus is unnecessary from normally sterile sites, where any fungus will not be overgrown by normal bacterial flora.
Cultures incubated 4 days.
See also Mycology section in text at front of Lab Manual.
Synonyms: Fungal culture

COLLECTION

Sample Type: Sputum, Wound
Collect: Clean collection cup, swab
Stability (from collection to initiation): Refrigerated 24 hours
Unacceptable Conditions: Samples on swabs

PROCESSING

Test Code: P259A
Test Group: Fungal Culture
Performing Lab: Microbiology
Unacceptable Conditions: Samples on swabs
Stability (from collection to initiation): Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information: Preferable when Aspergillus species are the only fungal pathogen of concern. A separate culture for Aspergillus is unnecessary from normally sterile sites, where any fungus will not be overgrown by normal bacterial flora.
Cultures incubated 4 days.
See also Mycology section in text at front of Lab Manual.
ADMINISTRATIVE

CPT Codes:
87102

COMPLETE VIEW

Available Stat:
No
Test Code:
P259A
Test Group:
Fungal Culture
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Collect:
Clean collection cup, swab
Sample Type:
Sputum, Wound
Unacceptable Conditions:
Samples on swabs
Synonyms:
- Fungal culture
Stability (from collection to initiation):
Refrigerated 24 hours
Additional Information:
Preferable when Aspergillus species are the only fungal pathogen of concern. A separate culture for Aspergillus is unnecessary from normally sterile sites, where any fungus will not be overgrown by normal bacterial flora.
Cultures incubated 4 days.
See also Mycology section in text at front of Lab Manual.
CPT Codes:
87102
Autoimmune Encephalopathy panel, CSF
ENCEC

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
IFA/RIA/CBA/WB

Additional Information:
This antibody panel may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation.

Testing includes testing for Ab's to:

- Neuronal VGKC autoantibody
- AGNA-1
- Amphiphysin
- ANNA-1
- ANNA-2
- ANNA-3
- CRMP-5-IgG
- PCA-1
- PCA-2
- PCA-Tr
- AMPAR-Ab
- GABAR-Ab
- NMDAR-Ab
- GAD65

Reflex Testing:
The following tests may be reflexively added and billed for based on screening results if appropriate:

- Amphiphysin Western blot
- CRMP-5 Western blot confirmation
- Paraneoplastic autoantibody Western blot confirmation
- NMO/AQP4-IgG
- CBA
- AMPAR-Ab titer
- GABAR-Ab titer
- NMDAR-Ab titer

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
4 mL
Preferred Volume:
4 mL
Minimum Volume:
2 mL
Stability (from collection to initiation):
Room temperature 3 days, refrigerated or frozen 4 weeks
Unacceptable Conditions:
Grossly blood samples

Rejection Criteria:
Grossly blood samples

PROCESSING

Test Code:
ENCEC

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Aliquot and freeze sample. Send to CB frozen. Order Mayo test code ENCEC

Preferred Volume:
4 mL

Minimum Volume:
2 mL

Unacceptable Conditions:
Grossly blood samples

Rejection Criteria:
Grossly blood samples

Stability (from collection to initiation):
Room temperature 3 days, refrigerated or frozen 4 weeks

RESULT INTERPRETATION

Additional Information:
This antibody panel may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation.

Testing includes testing for Ab’s to:

- Neuronal VGKC autoantibody
- AGNA-1
- Amphiphysin
- ANNA-1
- ANNA-2
- ANNA-3
- CRMP-5-IgG
- PCA-1
- PCA-2
- PCA-Tr
- AMPAR-Ab
- GABAR-Ab
- NMDAR-Ab
- GAD65

ADMINISTRATIVE

CPT Codes:
83519-90 Neuronal VGKC autoantibody
86256-90 AGNA-1
86256-90 Amphiphysin
86256-90 ANNA-1
86256-90 ANNA-2
86256-90 ANNA-3
86256-90 CRMP-5-IgG
86256-90 PCA-1
86256-90 PCA-2
86256-90 PCA-Tr
86255-90 AMPAR-Ab
86255-90 GABAR-Ab
86255-90 NMDAR-Ab
86341-90 GAD65
84182-90 Amphiphysin Western blot (if appropriate)
84182-90 CRMP-5 Western blot confirmation (if appropriate)
84182-90 Paraneoplastic autoantibody Western blot confirmation (if appropriate)
86255-90 NMO/AQP4-IgG CBA (if appropriate)
86256-90 AMPAR-Ab titer (if appropriate)
86256-90 GABAR-Ab titer (if appropriate)
86256-90 NMDAR-Ab titer (if appropriate)

LOINC Codes:
53714-2, 35142-9, 24400-4, 24401-2, 35144-5, 35385-4, 14248-9, 35143-7, 51748-2, 53708-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
ENCEC

**Performing Lab:**
Mayo

**Sendout:**
Yes

**Methodology:**
IFA/RIA/CBA/WB

**Collect:**
CSF tube or sterile collection tube

**Amount to Collect:**
4 mL

**Sample Type:**
CSF

**Preferred Volume:**
4 mL

**Minimum Volume:**
2 mL

**Rejection Criteria:**
Grossly blood samples

**Unacceptable Conditions:**
Grossly blood samples

**Specimen Preparation:**
Aliquot and freeze sample. Send to CB frozen. Order Mayo test code ENCEC

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated or frozen 4 weeks

**Reflex Testing:**
The following tests may be reflexively added and billed for based on screening results if appropriate:

- Amphiphysin Western blot
- CRMP-5 Western blot confirmation
- Paraneoplastic autoantibody Western blot confirmation
- NMO/AQP4-IgG CBA
- AMPAR-Ab titer
GABAR-Ab titer
NMDAR-Ab titer

Additional Information:

This antibody panel may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation.

Testing includes testing for Ab’s to:

Neuronal VGKC autoantibody
AGNA-1
Amphiphysin
ANNA-1
ANNA-2
ANNA-3
CRMP-5-IgG
PCA-1
PCA-2
PCA-Tr
AMPAR-Ab
GABAR-Ab
NMDAR-Ab
GAD65

CPT Codes:
83519-90 Neuronal VGKC autoantibody
86256-90 AGNA-1
86256-90 Amphiphysin
86256-90 ANNA-1
86256-90 ANNA-2
86256-90 ANNA-3
86256-90 CRMP-5-IgG
86256-90 PCA-1
86256-90 PCA-2
86256-90 PCA-Tr
86255-90 AMPAR-Ab
86255-90 GABAR-Ab
86255-90 NMDAR-Ab
86341-90 GAD65
84182-90 Amphiphysin Western blot (if appropriate)
84182-90 CRMP-5 Western blot confirmation (if appropriate)
84182-90 Paraneoplastic autoantibody Western blot confirmation (if appropriate)
86255-90 NMO/AQP4-IgG CBA (if appropriate)
86256-90 AMPAR-Ab titer (if appropriate)
86256-90 GABAR-Ab titer (if appropriate)
86256-90 NMDAR-Ab titer (if appropriate)

LOINC Codes:
53714-2, 35142-9, 24400-4, 24401-2, 35144-5, 35385-4, 14248-9, 35143-7, 51748-2, 53708-4
Autoimmune Encephalopathy panel, serum
ENCES

ORDERING

Available Stat:
No

Performing Lab:
Mayo

Methodology:
IFA/RIA/CBA/WB

Reported:
4-10 days

Additional Information:
Please note: Do not also order the paraneoplastic autoantibody panel (test code: PAE), as PAE is already a component of the Autoimmune Encephalopathy Panel.

This test may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation

Testing includes testing for the following Ab's:

- ACh receptor (muscle) binding antibody
- AChR ganglionic neuronal antibody
- Neuronal VGKC autoantibody
- N-type calcium channel antibody
- P/Q-type calcium channel antibody
- AGNA-1
- Amphiphysin
- ANNA-1
- ANNA-2
- ANNA-3
- CRMP-5-IgG
- PCA-1
- PCA-2
- PCA-Tr
- AMPAR-Ab
- GABAR-Ab
- NMDAR-Ab
- GAD65
- Amphiphysin Western blot (if appropriate)
- CRMP-5 Western blot confirmation (if appropriate)
- Paraneoplastic autoantibody Western blot confirmation (if appropriate)
- NMO/AQP4-IgG CBA (if appropriate)
- AMPAR-Ab titer (if appropriate)
- GABAR-Ab titer (if appropriate)
- NMDAR-Ab titer (if appropriate)

Reflex Testing:
The following tests may be reflexively added and billed for based on screening results if appropriate:

- Amphiphysin Western blot
- CRMP-5 Western blot confirmation
- Paraneoplastic autoantibody Western blot confirmation
- NMO/AQP4-IgG CBA
- AMPAR-Ab titer
- GABAR-Ab titer
- NMDAR-Ab titer

COLLECTION

Printed 06/07/19
Test information subject to change
Sample Type:
    Serum

Collect:
    Red top or Gold top

Amount to Collect:
    8 mL blood

Preferred Volume:
    4 mL serum

Minimum Volume:
    2 mL serum

Stability (from collection to initiation):
    Room temperature 3 days, refrigerated or frozen 4 weeks.

Unacceptable Conditions:
    Gross hemolysis

Rejection Criteria:
    Gross hemolysis

PROCESSING

Test Code:
    ENCES

Sendout:
    Yes

Performing Lab:
    Mayo

Specimen Preparation:
    Aliquot and freeze serum. Ship to CB frozen. Order Mayo test code ENCES

Preferred Volume:
    4 mL serum

Minimum Volume:
    2 mL serum

Unacceptable Conditions:
    Gross hemolysis

Rejection Criteria:
    Gross hemolysis

Stability (from collection to initiation):
    Room temperature 3 days, refrigerated or frozen 4 weeks.

RESULT INTERPRETATION

Additional Information:
    Please note: Do not also order the paraneoplastic autoantibody panel (test code: PAE), as PAE is already a component of the Autoimmune Encephalopathy Panel.

    This test may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation

    Testing includes testing for the following Ab's:

        ACh receptor (muscle) binding antibody
        AChR ganglionic neuronal antibody
        Neuronal VGKC autoantibody
        N-type calcium channel antibody
        P/Q-type calcium channel antibody
        AGNA-1
Amphiphysin  
ANNA-1  
ANNA-2  
ANNA-3  
CRMP-5-IgG  
PCA-1  
PCA-2  
PCA-Tr  
AMPAR-Ab  
GABAR-Ab  
NMDAR-Ab  
GAD65  
Amphiphysin Western blot (if appropriate)  
CRMP-5 Western blot confirmation (if appropriate)  
Paraneoplastic autoantibody Western blot confirmation (if appropriate)  
NMO/AQP4-IgG CBA (if appropriate)  
AMPAR-Ab titer (if appropriate)  
GABAR-Ab titer (if appropriate)  
NMDAR-Ab titer (if appropriate)  

**ADMINISTRATIVE**

**CPT Codes:**

- 83519-90 ACh receptor (muscle) binding antibody  
- 83519-90 AChR ganglionic neuronal antibody  
- 83519-90 Neuronal VGKC autoantibody  
- 83519-90 N-type calcium channel antibody  
- 83519-90 P/Q-type calcium channel antibody  
- 86256-90 AGNA-1  
- 86256-90 Amphiphysin  
- 86256-90 ANNA-1  
- 86256-90 ANNA-2  
- 86256-90 ANNA-3  
- 86256-90 CRMP-5-IgG  
- 86256-90 PCA-1  
- 86256-90 PCA-2  
- 86256-90 PCA-Tr  
- 86255-90 AMPAR-Ab  
- 86255-90 GABAR-Ab  
- 86255-90 NMDAR-Ab  
- 86341-GAD65  
- 84182-90 Amphiphysin Western blot (if appropriate)  
- 84182-90 CRMP-5 Western blot confirmation (if appropriate)  
- 84182-90 Paraneoplastic autoantibody Western blot confirmation (if appropriate)  
- 86255-90 NMO/AQP4-IgG CBA (if appropriate)  
- 86256-90 AMPAR-Ab titer (if appropriate)  
- 86256-90 GABAR-Ab titer (if appropriate)  
- 86256-90 NMDAR-Ab titer (if appropriate)  

**LOINC Codes:**

- 53709-2, 33927-5, 13997-2, 43188-2, 33924-2, 11034-6, 33979-6, 33980-4, 35386-2, 42233-7, 30347-9, 33925-9, 53717-5, 33926-7, 41871-5  

**COMPLETE VIEW**

- **Available Stat:** No  
- **Test Code:** ENCES  
- **Performing Lab:** Mayo  
- **Sendout:**
Methodology:
IFA/RIA/CBA/WB

Collect:
Red top or Gold top

Amount to Collect:
8 mL blood

Sample Type:
Serum

Preferred Volume:
4 mL serum

Minimum Volume:
2 mL serum

Rejection Criteria:
Gross hemolysis

Unacceptable Conditions:
Gross hemolysis

Specimen Preparation:
Aliquot and freeze serum. Ship to CB frozen. Order Mayo test code ENCES

Stability (from collection to initiation):
Room temperature 3 days, refrigerated or frozen 4 weeks.

Reported:
4-10 days

Reflex Testing:
The following tests may be reflexively added and billed for based on screening results if appropriate:

- Amphiphysin Western blot
- CRMP-5 Western blot confirmation
- Paraneoplastic autoantibody Western blot confirmation
- NMO/AQP4-IgG CBA
- AMPAR-Ab titer
- GABAR-Ab titer
- NMDAR-Ab titer

Additional Information:
Please note: Do not also order the paraneoplastic autoantibody panel (test code: PAE), as PAE is already a component of the Autoimmune Encephalopathy Panel.

This test may be useful for evaluating new onset encephalopathy (noninfectious or metabolic) comprising confusional states, psychosis, delirium, memory loss, hallucinations, movement disorders, sensory or motor complaints, seizures, dyssomnias, ataxias, nausea, vomiting, inappropriate antidiuresis, coma, dysautonomias, or hypoventilation

Testing includes testing for the following Ab's:

- ACh receptor (muscle) binding antibody
- AChR ganglionic neuronal antibody
- Neuronal VGKC autoantibody
- N-type calcium channel antibody
- P/Q-type calcium channel antibody
- AGNA-1
- Amphiphysin
- ANNA-1
- ANNA-2
- ANNA-3
- CRMP-5-IgG
- PCA-1
- PCA-2
- PCA-Tr
- AMPAR-Ab
- GABAR-Ab
- NMDAR-Ab
GAD65
Amphiphysin Western blot (if appropriate)
CRMP-5 Western blot confirmation (if appropriate)
Paraneoplastic autoantibody Western blot confirmation (if appropriate)
NMO/AQP4-IgG CBA (if appropriate)
AMPAR-Ab titer (if appropriate)
GABAR-Ab titer (if appropriate)
NMDAR-Ab titer (if appropriate)

CPT Codes:
83519-90 ACh receptor (muscle) binding antibody
83519-90 AChR ganglionic neuronal antibody
83519-90 Neuronal VGKC autoantibody
83519-90 N-type calcium channel antibody
83519-90 P/Q-type calcium channel antibody
86256-90 AGNA-1
86256-90 Amphiphysin
86256-90 ANNA-1
86256-90 ANNA-2
86256-90 ANNA-3
86256-90 CRMP-5-IgG
86256-90 PCA-1
86256-90 PCA-2
86256-90 PCA-Tr
86255-90 AMPAR-Ab
86255-90 GABAR-Ab
86255-90 NMDAR-Ab
86341-GAD65
84182-90 Amphiphysin Western blot (if appropriate)
84182-90 CRMP-5 Western blot confirmation (if appropriate)
84182-Paraneoplastic autoantibody Western blot confirmation (if appropriate)
86255-90 NMO/AQP4-IgG CBA (if appropriate)
86256-90 AMPAR-Ab titer (if appropriate)
86256-90 GABAR-Ab titer (if appropriate)
86256-90 NMDAR-Ab titer (if appropriate)

LOINC Codes:
53709-2, 33927-5, 13997-2, 43188-2, 33924-2, 11034-6, 33979-6, 33980-4, 35386-2, 42233-7, 30347-9, 33925-9, 53717-5, 33926-7, 41871-5
Avian Influenza A
P319

ORDERING

Available Stat:
No
Performing Lab:
State Viral & Rickettsial Disease Laboratory
Methodology:
PCR
Reported:
2 days after receipt at the State Viral & Rickettsial Disease Laboratory

Additional Information:
Avian influenza A (H5N1) testing is indicated for hospitalized patients with:

1. Radiographically confirmed pneumonia, acute respiratory distress syndrome, or other severe respiratory illness for which an alternate diagnosis has not been established, **AND**
2. History of travel within 10 days of symptom onset to a country with documented H5N1 avian influenza in poultry and/or humans.

For an updated list of countries affected by H5N1 see www.sfdph.org/cdcp and locate Avian Influenza under the tab Infectious Diseases A-Z.

Testing should be considered on a case by case basis in consultation with SFDPH for hospitalized or ambulatory patients with:

1. Documented temperature of > 38°C (> 100.4°F), **AND**
2. One or more of the following: cough, sore throat, shortness of breath, **AND**
3. History of contact with poultry OR a known or suspected human case of influenza A (H5N1) in an H5N1-affected country within 10 days of symptom onset.

Viral cultures on specimens from suspected avian influenza cases are not done in the Clinical Laboratories. Test performed by California Dept. of Health Services, Microbial Diseases Laboratory, 850 Marina Bay Parkway, Richmond, CA 94804

Synonyms:
- H5N1

COLLECTION

Sample Type:
Nasopharyngeal swab
Collect:
Flocked swab in Universal Transport Medium (UTM)

**DO NOT** use cotton or calcium arginate swabs for collection

Amount to Collect:
1 Flocked swab
Preferred Volume:
1 Flocked swab
Minimum Volume:
1 Flocked swab

Remarks:
**IMPORTANT:** If avian influenza is suspected, call SFDPH Disease Control at (415)554-2830 immediately for consultation to determine the need for testing.

Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Stability (from collection to initiation):

Printed 06/07/19
Test information subject to change
Refrigerated 3 days, frozen 1 month

**Unacceptable Conditions:**
Collected with cotton or cotton alginate swabs and wooden handles

**PROCESSING**

**Test Code:**
P319

**Sendout:**
Yes

**Performing Lab:**
State Viral & Rickettsial Disease Laboratory

**Specimen Preparation:**
Refrigerate specimen and transport to SFDPH Laboratory with cold packs, along with a SFDPH laboratory form. Specimens are stable at 2-8°C for 72 hours. Freeze at -70°C if transport time to SFDPH is > 72 hours.

When specimen is received, notify supervisor (virologist or senior CLS after hours/weekend) to call State Viral & Rickettsial Disease lab (510)307-8585.

**Preferred Volume:**
1 Flocked swab

**Minimum Volume:**
1 Flocked swab

**Unacceptable Conditions:**
Collected with cotton or cotton alginate swabs and wooden handles

**Stability (from collection to initiation):**
Refrigerated 3 days, frozen 1 month

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
Avian influenza A (H5N1) testing is indicated for hospitalized patients with:

1. Radiographically confirmed pneumonia, acute respiratory distress syndrome, or other severe respiratory illness for which an alternate diagnosis has not been established, **AND**
2. History of travel within 10 days of symptom onset to a country with documented H5N1 avian influenza in poultry and/or humans.

For an updated list of countries affected by H5N1 see www.sfdph.org/cdcp and locate Avian Influenza under the tab Infectious Diseases A-Z.

Testing should be considered on a case by case basis in consultation with SFDPH for hospitalized or ambulatory patients with:

1. Documented temperature of > 38°C (> 100.4°F), **AND**
2. One or more of the following: cough, sore throat, shortness of breath, **AND**
3. History of contact with poultry OR a known or suspected human case of influenza A (H5N1) in an H5N1-affected country within 10 days of symptom onset.

Viral cultures on specimens from suspected avian influenza cases are not done in the Clinical Laboratories. Test performed by California Dept. of Health Services, Microbial Diseases Laboratory, 850 Marina Bay Parkway, Richmond, CA 94804

**ADMINISTRATIVE**

**LOINC Codes:**
29257-3

**COMPLETE VIEW**
Available Stat: No
Test Code: P319
Performing Lab: State Viral & Rickettsial Disease Laboratory
Sendout: Yes
Methodology: PCR
Remarks:
IMPORTANT: If avian influenza is suspected, call SFDPH Disease Control at (415)554-2830 immediately for consultation to determine the need for testing.

Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Collect:
Flocked swab in Universal Transport Medium (UTM)

DO NOT use cotton or calcium alginate swabs for collection

Amount to Collect:
1 Flocked swab

Sample Type: Nasopharyngeal swab

Preferred Volume:
1 Flocked swab

Minimum Volume:
1 Flocked swab

Unacceptable Conditions:
Collected with cotton or cotton alginate swabs and wooden handles

Specimen Preparation:
Refrigerate specimen and transport to SFDPH Laboratory with cold packs, along with a SFDPH laboratory form. Specimens are stable at 2-8°C for 72 hours. Freeze at -70°C if transport time to SFDPH is > 72 hours.

When specimen is received, notify supervisor (virologist or senior CLS after hours/weekend) to call State Viral & Rickettsial Disease lab (510)307-8585.

Reference Interval:
Negative

Synonyms:
• H5N1

Stability (from collection to initiation):
Refrigerated 3 days, frozen 1 month

Reported:
2 days after receipt at the State Viral & Rickettsial Disease Laboratory

Additional Information:
Avian influenza A (H5N1) testing is indicated for hospitalized patients with:

1. Radiographically confirmed pneumonia, acute respiratory distress syndrome, or other severe respiratory illness for which an alternate diagnosis has not been established, AND
2. History of travel within 10 days of symptom onset to a country with documented H5N1 avian influenza in poultry and/or humans.

For an updated list of countries affected by H5N1 see www.sfdph.org/cdc and locate Avian Influenza under the tab Infectious Diseases A-Z.

Testing should be considered on a case by case basis in consultation with SFDPH for hospitalized or ambulatory patients with:
1. Documented temperature of > 38°C (> 100.4°F), AND
2. One or more of the following: cough, sore throat, shortness of breath, AND
3. History of contact with poultry OR a known or suspected human case of influenza A (H5N1) in an H5N1-affected country within 10 days of symptom onset.

Viral cultures on specimens from suspected avian influenza cases are not done in the Clinical Laboratories. Test performed by California Dept. of Health Services, Microbial Diseases Laboratory, 850 Marina Bay Parkway, Richmond, CA 94804

**LOINC Codes:**

29257-3
B. pertussis/parapertussis DNA
P355

ORDERING

Performing Lab: Microbiology
Methodology: Nucleic Acid Amplification
Reported: 1-2 days
Synonyms:
- Whooping Cough
- Haemophilus pertussis
- Bordetella pertussis PCR
- Bordetella parapertussis
- Bordetella pertussis DNA

COLLECTION

Sample Type: Nasopharyngeal swab
Collect: Flocked swab in Universal Transport Medium (UTM)
Amount to Collect: 1 flocked swab
Remarks: Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.
Stability (from collection to initiation): Room temperature up to 8 hours; Refrigerated at 2-8C up to 7 days
Storage/Transport Temperature: Refrigerate at 2-8C up to 7 days; Freeze at -70C up to 5 months

PROCESSING

Test Code: P355
Performing Lab: Microbiology
Stability (from collection to initiation): Room temperature up to 8 hours; Refrigerated at 2-8C up to 7 days
Storage/Transport Temperature: Refrigerate at 2-8C up to 7 days; Freeze at -70C up to 5 months

RESULT INTERPRETATION

Reference Interval: Not Detected
Critical Values: Positive for Bordetella spp.
**COMPLETE VIEW**

**Test Code:**
- P355

**Performing Lab:**
- Microbiology

**Methodology:**
- Nucleic Acid Amplification

**Remarks:**
- Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

**Collect:**
- Flocked swab in Universal Transport Medium (UTM)

**Amount to Collect:**
- 1 flocked swab

**Sample Type:**
- Nasopharyngeal swab

**Reference Interval:**
- Not Detected

**Critical Values:**
- Positive for Bordetella spp.

**Synonyms:**
- Whooping Cough
- Haemophilus pertussis
- Bordetella pertussis PCR
- Bordetella parapertussis
- Bordetella pertussis DNA

**Storage/Transport Temperature:**
- Refrigerate at 2-8°C up to 7 days; Freeze at -70°C up to 5 months

**Stability (from collection to initiation):**
- Room temperature up to 8 hours; Refrigerated at 2-8°C up to 7 days

**Reported:**
- 1-2 days

**CPT Codes:**
- 87798 x 2

**LOINC Codes:**
- 62428-8
Babesia microti Antibodies (IgG & IgM)

**BABES**

**ORDERING**

Available Stat:
No

Performing Lab:
Focus via Quest

Methodology:
Immunofluorescence assay

Reported:
Set up 5x per week. Turnaround time 4-6 days

Additional Information:
Elevated antibody levels to B. microti indicate exposure to the organism. Human babesiosis infection is transmitted by the bite of an infected Ixodes tick or less frequently from transfusion with blood from an infected donor. Definitive diagnosis is made by identifying intraerythrocytic organisms in peripheral blood. In patients with low parasitemia, antibody detection by IFA is recommended. IgG levels greater than or equal to 1:1024 can be detected in acute phase patients with parasites in blood smears. The IFA assay can be used as a seroepidemiologic tool to study the frequency and distribution of B. microti in endemic areas especially in persons with mixed infections also involving Borrelia burgdorferi.

Human Babesia antibodies may persist for 6-12 months after acute illness, and may cross-react with malaria antibodies.

**Synonyms:**
- Babesiosis

**COLLECTION**

Sample Type:
Serum

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Room temperature 72 hours, refrigerated 1 week, frozen at -20C 1 month.

**Unacceptable Conditions:**
Sample collected in Gold top

**PROCESSING**

Test Code:
BABES

Sendout:
Yes

Performing Lab:
Focus via Quest

Specimen Preparation:
Refrigerate sample. Order Quest # 34300

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

**Unacceptable Conditions:**
- Sample collected in Gold top

**Stability (from collection to initiation):**
- Room temperature 72 hours, refrigerated 1 week, frozen at -20C 1 month.

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**RESULT INTERPRETATION**

**Units:**
- titer

**Reference Interval:**
- Babesia Ab IgG: < 1:64 titer
- Babesia Ab IgM: < 1:20 titer

**Additional Information:**
Elevated antibody levels to B. microti indicate exposure to the organism. Human babesiosis infection is transmitted by the bite of an infected Ixodes tick or less frequently from transfusion with blood from an infected donor. Definitive diagnosis is made by identifying intraerythrocytic organisms in peripheral blood. In patients with low parasitemia, antibody detection by IFA is recommended. IgG levels greater than or equal to 1:1024 can be detected in acute phase patients with parasites in blood smears. The IFA assay can be used as a seroepidemiologic tool to study the frequency and distribution of B. microti in endemic areas especially in persons with mixed infections also involving Borrelia burgdorferi.

Human Babesia antibodies may persist for 6-12 months after acute illness, and may cross-react with malaria antibodies.

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**ADMINISTRATIVE**

**CPT Codes:**
- 86753-90 x2

**LOINC Codes:**
- 16427-7

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BABES

**Performing Lab:**
- Focus via Quest

**Sendout:**
- Yes

**Methodology:**
- Immunofluorescence assay

**Collect:**
- Red top (Gold top NOT acceptable)

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Unacceptable Conditions:**
- Sample collected in Gold top

**Specimen Preparation:**
- Refrigerate sample. Order Quest # 34300
Uns: titer

Reference Interval:
   Babesia Ab IgG: < 1:64 titer
   Babesia Ab IgM: < 1:20 titer

Synonyms:
   - Babesiosis

Stability (from collection to initiation):
   Room temperature 72 hours, refrigerated 1 week, frozen at -20C 1 month.

Reported:
   Set up 5x per week. Turnaround time 4-6 days

Additional Information:
   Elevated antibody levels to B. microti indicate exposure to the organism. Human babesiosis infection is transmitted by the bite of an infected Ixodes tick or less frequently from transfusion with blood from an infected donor. Definitive diagnosis is made by identifying intraerythrocytic organisms in peripheral blood. In patients with low parasitemia, antibody detection by IFA is recommended. IgG levels greater than or equal to 1:1024 can be detected in acute phase patients with parasites in blood smears. The IFA assay can be used as a seroepidemiologic tool to study the frequency and distribution of B. microti in endemic areas especially in persons with mixed infections also involving Borrelia burgdorferi.

   Human Babesia antibodies may persist for 6-12 months after acute illness, and may cross-react with malaria antibodies.

CPT Codes:
   86753-90 x2

LOINC Codes:
   16427-7
Bacterial Culture and Gram stain, CSF
P076

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Microbiology

**Performed:**
Set up daily, day and evening shifts

**Methodology:**
Aerobic and Anaerobic culture

**Additional Information:**
Performed on tube #2. Includes Aerobic & Anaerobic cultures w/ gram stain.

**Reflex Testing:**
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

**COLLECTION**

**Sample Type:**
CSF

**Collect:**
CSF tube or sterile collection tube

**Amount to Collect:**
5 mL CSF

**Preferred Volume:**
5 mL CSF

**Remarks:**
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Stability (from collection to initiation):**
Incubated at 35-37°C, 24 hours

**Unacceptable Conditions:**
Refrigerated samples

**PROCESSING**

**Test Code:**
P076

**Test Group:**
Bacterial Culture

**Performing Lab:**
Microbiology

**Specimen Preparation:**
Maintain sample at room temperature

**Preferred Volume:**
5 mL CSF

**Unacceptable Conditions:**
Refrigerated samples

**Stability (from collection to initiation):**
Incubated at 35-37°C, 24 hours
RESULT INTERPRETATION

Additional Information:
Performed on tube #2. Includes Aerobic & Anaerobic cultures w/ gram stain.

ADMINISTRATIVE

CPT Codes:
87070; 87205; 87075
LOINC Codes:
606-4

COMPLETE VIEW

Available Stat:
No
Test Code:
P076
Test Group:
Bacterial Culture
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Aerobic and Anaerobic culture
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
CSF tube or sterile collection tube
Amount to Collect:
5 mL CSF
Sample Type:
CSF
Preferred Volume:
5 mL CSF
Unacceptable Conditions:
Refrigerated samples
Specimen Preparation:
Maintain sample at room temperature
Stability (from collection to initiation):
Incubated at 35-37C, 24 hours
Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.
Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.
Additional Information:
Performed on tube #2. Includes Aerobic & Anaerobic cultures w/ gram stain.
CPT Codes:
87070; 87205; 87075
LOINC Codes:
606-4
Bacterial Culture and Gram stain, Genital
P070

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Set up daily, day and evening shifts
Additional Information: Aerobic culture only, Includes culture for Gonococcus.
Reflex Testing: If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.
Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Sample Type: Swab x2
Collect: Tubed charcoal containing transport medium.
Remarks: Submit two swabs.
Stability (from collection to initiation): 12 hours in appropriate transport medium
Unacceptable Conditions: Swabs not received in transport media

PROCESSING

Test Code: P070
Test Group: Bacterial Culture
Performing Lab: Microbiology
Specimen Preparation: Maintain sample at room temperature
Unacceptable Conditions: Swabs not received in transport media
Stability (from collection to initiation): 12 hours in appropriate transport medium

RESULT INTERPRETATION

Additional Information: Aerobic culture only, Includes culture for Gonococcus.

ADMINISTRATIVE

CPT Codes:
COMPLETE VIEW

Available Stat:
   No

Test Code:
   P070

Test Group:
   Bacterial Culture

Performing Lab:
   Microbiology

Performed:
   Set up daily, day and evening shifts

Remarks:
   Submit two swabs.

Collect:
   Tubed charcoal containing transport medium.

Sample Type:
   Swab x2

Unacceptable Conditions:
   Swabs not received in transport media

Specimen Preparation:
   Maintain sample at room temperature

Stability (from collection to initiation):
   12 hours in appropriate transport medium

Reflex Testing:
   If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

   Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
   Aerobic culture only, includes culture for Gonococcus.

CPT Codes:
   87070; 87205

LOINC Codes:
   10352-3
Bacterial Culture and Gram stain, Respiratory
P063

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Aerobic culture
Additional Information:
Includes gram stain.
Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.
Synonyms:
- Sputum culture
- Lung culture
- BAL culture

COLLECTION

Sample Type:
BAL, lung biopsy, sputum, external eye, ear, or sinus drainage.
Collect:
Clean container, swabs in transport media
Remarks:
Submit expectorated sputum in cup with screw-on or snap-on lid. For tissue samples collected by a surgical procedure, see entry for Head and Neck
Stability (from collection to initiation):
Refrigerated 24 hours
Unacceptable Conditions:
More than one sputum or ETA in 48 hours.

PROCESSING

Test Code:
P063
Test Group:
Bacterial Culture
Performing Lab:
Microbiology
Specimen Preparation:
Maintain sample at room temperature
Unacceptable Conditions:
More than one sputum or ETA in 48 hours.
Stability (from collection to initiation):
Refrigerated 24 hours
RESULT INTERPRETATION

Critical Values:
First positive Burkholderia cepacia isolate from a CF patient.

Additional Information:
Includes gram stain.

ADMINISTRATIVE

CPT Codes:
87205; 87070

LOINC Codes:
622-1

COMPLETE VIEW

Available Stat:
No

Test Code:
P063

Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Remarks:
Submit expectorated sputum in cup with screw-on or snap-on lid. For tissue samples collected by a surgical procedure, see entry for Head and Neck

Collect:
Clean container, swabs in transport media

Sample Type:
BAL, lung biopsy, sputum, external eye, ear, or sinus drainage.

Unacceptable Conditions:
More than one sputum or ETA in 48 hours.

Specimen Preparation:
Maintain sample at room temperature

Critical Values:
First positive Burkholderia cepacia isolate from a CF patient.

Synonyms:
- Sputum culture
- Lung culture
- BAL culture

Stability (from collection to initiation):
Refrigerated 24 hours

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Includes gram stain.

CPT Codes:
87205; 87070

LOINC Codes:
622-1
Bacterial Culture and Gram stain, Wound, Superficial skin
P080

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Additional Information:
Includes aerobic culture and gram stain. Incubated for 48 hours.
Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Sample Type:
Aspirate or swab
Collect:
Syringe w/out needle, swab in transport media
Remarks:
Submit pus in a syringe after removing needle. If there is insufficient pus to aspirate, submit two sterile swabs in charcoal-containing transport medium.

If anaerobic culture is desired, check the box on the request slip for ‘AEROBIC & ANAEROBIC’.
Stability (from collection to initiation):
Room temperature 24 hours (after 12 hours the recovery of fastidious organisms may be compromised)
Unacceptable Conditions:
Swabs not received in transport media.

PROCESSING

Test Code:
P080
Test Group:
Bacterial Culture
Performing Lab:
Microbiology
Specimen Preparation:
Maintain sample at room temperature
Unacceptable Conditions:
Swabs not received in transport media.
Stability (from collection to initiation):
Room temperature 24 hours (after 12 hours the recovery of fastidious organisms may be compromised)

RESULT INTERPRETATION

Additional Information:
Includes aerobic culture and gram stain. Incubated for 48 hours.
CPT Codes:
87205; 87070

COMPLETE VIEW

Available Stat:
No

Test Code:
P080

Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Remarks:
Submit pus in a syringe after removing needle. If there is insufficient pus to aspirate, submit two sterile swabs in charcoal-containing transport medium.

If anaerobic culture is desired, check the box on the request slip for 'AEROBIC & ANAEROBIC'.

Collect:
Syringe w/out needle, swab in transport media

Sample Type:
Aspirate or swab

Unacceptable Conditions:
Swabs not received in transport media.

Specimen Preparation:
Maintain sample at room temperature

Stability (from collection to initiation):
Room temperature 24 hours (after 12 hours the recovery of fastidious organisms may be compromised)

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Includes aerobic culture and gram stain. Incubated for 48 hours.

CPT Codes:
87205; 87070
Bacterial Culture, Non-sterile Site (excluding superficial skin) with Gram stain

P082

ORDERING

Available Stat:
- No

Performing Lab:
- Microbiology

Performed:
- Set up daily, day and evening shifts

Methodology:
- Aerobic and anaerobic culture Gram stain

Reported:
- Up to 4 days

Additional Information:
- Includes aerobic and anaerobic cultures and Gram stain.

Reflex Testing:
- If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.
- Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Sample Type:
- Aspirate, unfixed tissue from normally non-sterile sites (e.g. skin biopsy, sinus), swab, drainage (e.g. bile, JP)

Collect:
- Fluid: Sterile tube or container
- Swab: Amies transport medium with charcoal

Stability (from collection to initiation):
- Room temperature 12 hours

Unacceptable Conditions:
- Swabs not received in transport medium.

PROCESSING

Test Code:
- P082

Test Group:
- Bacterial culture

Performing Lab:
- Microbiology

Specimen Preparation:
- Maintain specimen at room temperature.

Unacceptable Conditions:
- Swabs not received in transport medium.

Stability (from collection to initiation):
- Room temperature 12 hours

RESULT INTERPRETATION

Additional Information:
- Includes aerobic and anaerobic cultures and Gram stain.
CPT Codes:
87205, 87070, 87075

COMPLETE VIEW

Available Stat:
No

Test Code:
P082

Test Group:
Bacterial culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic and anaerobic culture Gram stain

Collect:
Fluid: Sterile tube or container
Swab: Amies transport medium with charcoal

Sample Type:
Aspirate, unfixed tissue from normally non-sterile sites (e.g. skin biopsy, sinus), swab, drainage (e.g. bile, JP)

Unacceptable Conditions:
Swabs not received in transport medium.

Specimen Preparation:
Maintain specimen at room temperature.

Stability (from collection to initiation):
Room temperature 12 hours

Reported:
Up to 4 days

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Includes aerobic and anaerobic cultures and Gram stain.

CPT Codes:
87205, 87070, 87075
Bacterial Culture, Normally Sterile Site, with Gram stain
P095

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Aerobic and anaerobic culture Gram stain
Reported:
Up to 14 days
Additional Information:
Used for normally sterile fluids except blood, urine or CSF (e.g. joint, pericardial, peritoneal, pleural or vitreous). Includes aerobic and anaerobic cultures and Gram stain.
Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.
Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.
Synonyms:
• Surgical tissue culture, bone marrow culture

COLLECTION

Sample Type:
Body fluid, unfixed tissue from normally sterile sites, bone marrow aspirate
Collect:
Peritoneal fluid: Aerobic and anaerobic blood culture bottles, and sterile tube
Non-peritoneal fluid: Sterile tube
Tissue: Anaerobic transport vial or sterile container
Bone marrow aspirate: 1.5 mL Isolator tube
Swabs: Amies transport medium with charcoal
Amount to Collect:
Peritoneal fluid: 50 mL
Non-peritoneal fluid: 25 mL
Tissue: 5 cu mm
Bone marrow aspirate: 0.5 mL
Preferred Volume:
Peritoneal fluid: 50 mL
Non-peritoneal fluid: 25 mL
Tissue: 5 cu mm
Bone marrow aspirate: 0.5 mL
Minimum Volume:
Peritoneal fluid: 10 mL
Non-peritoneal fluid: 0.5 mL
Tissue: 1-2 cu mm
Bone marrow aspirate: 0.5 mL
Remarks:
Submitting peritoneal fluid (abdominal fluid, ascitic fluid, dialysis fluid) for bacterial culture:
1. inoculate 10 ml into each of aerobic and anaerobic blood culture bottles at the patient's bedside for optimal growth and recovery of organisms. Divide the fluid equally among the bottles if < 20 mL is obtained.
2. Submit additional fluid in a sterile tube, which allows for gram stain to be performed and faster identification of bacteria present at
high concentrations.

**Submitting tissue**
For tissues not collected in the OR, obtain anaerobic transport medium from Microbiology L553 or from the Mount Zion OR

**Submitting bone marrow aspirate**
Schedule in advance at the time the bone marrow is requested.

**Stability (from collection to initiation):**
Room temperature 12 hours

**Unacceptable Conditions:**
Swabs not received in transport medium.

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**PROCESSING**

**Test Code:**
P095

**Test Group:**
Bacterial culture

**Performing Lab:**
Microbiology

**Specimen Preparation:**
Maintain specimen at room temperature.

**Preferred Volume:**
- Peritoneal fluid: 50 mL
- Non-peritoneal fluid: 25 mL
- Tissue: 5 cu mm
- Bone marrow aspirate: 0.5 mL

**Minimum Volume:**
- Peritoneal fluid: 10 mL
- Non-peritoneal fluid: 0.5 mL
- Tissue: 1-2 cu mm
- Bone marrow aspirate: 0.5 mL

**Unacceptable Conditions:**
Swabs not received in transport medium.

**Stability (from collection to initiation):**
Room temperature 12 hours

---

**RESULT INTERPRETATION**

**Reference Interval:**
No growth

**Critical Values:**
Positive Gram stain

**Additional Information:**
Used for normally sterile fluids except blood, urine or CSF (e.g. joint, pericardial, peritoneal, pleural or vitreous). Includes aerobic and anaerobic cultures and Gram stain.

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**ADMINISTRATIVE**

**CPT Codes:**
- 87205
- 87070
- 87075

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**COMPLETE VIEW**

**Available Stat:**
No
Test Code:
P095

Test Group:
Bacterial culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic and anaerobic culture
Gram stain

Remarks:

Submitting peritoneal fluid (abdominal fluid, ascitic fluid, dialysis fluid) for bacterial culture:

1. inoculate 10 ml into each of aerobic and anaerobic blood culture bottles at the patient's bedside for optimal growth and recovery of organisms. Divide the fluid equally among the bottles if < 20 mL is obtained.

2. Submit additional fluid in a sterile tube, which allows for gram stain to be performed and faster identification of bacteria present at high concentrations.

Submitting tissue
For tissues not collected in the OR, obtain anaerobic transport medium from Microbiology L553 or from the Mount Zion OR

Submitting bone marrow aspirate
Schedule in advance at the time the bone marrow is requested.

Collect:
Peritoneal fluid: Aerobic and anaerobic blood culture bottles, and sterile tube
Non-peritoneal fluid: Sterile tube
Tissue: Anaerobic transport vial or sterile container
Bone marrow aspirate: 1.5 mL Isolator tube
Swabs: Amies transport medium with charcoal

Amount to Collect:
Peritoneal fluid: 50 mL
Non-peritoneal fluid: 25 mL
Tissue: 5 cu mm
Bone marrow aspirate: 0.5 mL

Sample Type:
Body fluid, unfixed tissue from normally sterile sites, bone marrow aspirate

Preferred Volume:
Peritoneal fluid: 50 mL
Non-peritoneal fluid: 25 mL
Tissue: 5 cu mm
?Bone marrow aspirate: 0.5 mL

Minimum Volume:
Peritoneal fluid: 10 mL
Non-peritoneal fluid: 0.5 mL
Tissue: 1-2 cu mm
Bone marrow aspirate: 0.5 mL

Unacceptable Conditions:
Swabs not received in transport medium.

Specimen Preparation:
Maintain specimen at room temperature.

Reference Interval:
No growth

Critical Values:
Positive Gram stain

Synonyms:
- Surgical tissue culture, bone marrow culture

Stability (from collection to initiation):
Room temperature 12 hours
Reported:
Up to 14 days

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Used for normally sterile fluids except blood, urine or CSF (e.g. joint, pericardial, peritoneal, pleural or vitreous). Includes aerobic and anaerobic cultures and Gram stain.

CPT Codes:
87205, 87070, 87075
Bacterial Culture, Stool
P166

ORDERING

Approval Required:
Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x31268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Methodology:
Culture

Reported:
3-5 days

Additional Information:
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

Unusual findings such as the absence of normal gram-negative enteric flora are reported.

If suspected Yersinia species [P158] and Vibrio species [P159] must be requested separately to ensure that selective media are inoculated.

C. difficile is not cultured. If C. difficile is suspected request the C. difficile antigen assay (P328).

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed if appropriate.

Susceptibility testing may be omitted upon request when sample is submitted for testing.

Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

Synonyms:
- Salmonella
- Shigella
- Campylobacter
- Vibrio

COLLECTION

Sample Type:
Stool

Collect:
Urine cup or C & S (Cary & Blair) transport medium

Amount to Collect:
5 mL

Preferred Volume:
5 mL

Minimum Volume:
Fresh stool: 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.
If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

**Stability (from collection to initiation):**
- Unpreserved 3 hours, preserved 1 week.

**Unacceptable Conditions:**
- Unpreserved stool received > 3 hours after collection. More than two samples per day.

### PROCESSING

**Test Code:**
- P166

**Test Group:**
- Bacterial Culture

**Performing Lab:**
- Microbiology

**Specimen Preparation:**
- If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

**Preferred Volume:**
- 5 mL

**Minimum Volume:**
- Fresh stool: 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

**Unacceptable Conditions:**
- Unpreserved stool received > 3 hours after collection. More than two samples per day.

**Stability (from collection to initiation):**
- Unpreserved 3 hours, preserved 1 week.

### RESULT INTERPRETATION

**Critical Values:**
- Inpatient results only. After hours outpatient results will be phoned the following morning.

Stools positive with E. coli O157:H7, Vibrio cholerae, Salmonella typhi, Salmonella paratyphi A, or Salmonella cholerasuis

**Additional Information:**
- Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

- Unusual findings such as the absence of normal gram-negative enteric flora are reported.

- If suspected Yersinia species [P158] and Vibrio species [P159] must be requested separately to ensure that selective media are inoculated.

- C. difficile is not cultured. If C. difficile is suspected request the C. difficile antigen assay (P328).

### ADMINISTRATIVE

**CPT Codes:**
- 87045, 87046

**LOINC Codes:**
- 625-4

### COMPLETE VIEW
Approval Required:
Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x31268

Available Stat:
No

Test Code:
P166

Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Methodology:
Culture

Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

Collect:
Urine cup or C & S (Cary & Blair) transport medium

Amount to Collect:
5 mL

Sample Type:
Stool

Preferred Volume:
5 mL

Minimum Volume:
Fresh stool : 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.

Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning.

Stools positive with E. coli O157:H7, Vibrio cholerae, Salmonella typhi, Salmonella paratyphi A, or Salmonella cholerasuis

Synonyms:
• Salmonella
• Shigella
• Campylobacter
• Vibrio

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week.

Reported:
3-5 days

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed if appropriate.

Susceptibility testing may be omitted upon request when sample is submitted for testing.
Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

**Additional Information:**

Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

Unusual findings such as the absence of normal gram-negative enteric flora are reported.

If suspected Yersinia species [P158] and Vibrio species [P159] must be requested separately to ensure that selective media are inoculated.

C. difficile is not cultured. If C. difficile is suspected request the C. difficile antigen assay (P328).

**CPT Codes:**

87045, 87046

**LOINC Codes:**

625-4
Barbiturates Screen, Urine
BARB

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Competitive enzyme immunoassay method (Beckman UniCel DxC800) using G6PDH labeling.

Reported:
Stat 2 hours, routine 4 hours

Additional Information:
A concentration of < 200 µg/L is considered negative by this test. A positive result is ≥ 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects a number of barbiturates at varying concentrations.

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BARQNT. False negative results are also possible.

Barbiturates can be detected in urine from 1 up to 14 days after use (especially for phenobarbital as it is long-acting).

Synonyms:
- Butisol
- Alurate
- Amobarbital
- Amytal
- Apobarbital
- Butabarbital
- Butalbital
- Fiorinal
- Gemonil
- Metharbital
- Secobarbital
- Seconal
- Tuinal

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
See preferred volume
Preferred Volume:
- 1 mL urine

Minimum Volume:
- 0.5 mL urine

Stability (from collection to initiation):
- Refrigerated 1 week, frozen at -20°C 2 weeks

PROCESSING

Test Code:
- BARB

Test Group:
- Barbiturate

Performing Lab:
- Parnassus & Mission Bay Chemistry

Preferred Volume:
- 1 mL urine

Minimum Volume:
- 0.5 mL urine

Stability (from collection to initiation):
- Refrigerated 1 week, frozen at -20°C 2 weeks

RESULT INTERPRETATION

Units:
- µg/L

Reference Interval:
- Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cutoff concentration of 200 µg/L

Additional Information:
A concentration of < 200 µg/L is considered negative by this test. A positive result is >= 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes. This assay detects a number of barbiturates at varying concentrations.

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BARQNT. False negative results are also possible.

Barbiturates can be detected in urine from 1 up to 14 days after use (especially for phenobarbital as it is long-acting).

ADMINISTRATIVE

CPT Codes:
- 80301

LOINC Codes:
- 20664-9

COMPLETE VIEW

Available Stat:
- Yes
Test Code: BARB
Test Group: Barbiturate
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Competitive enzyme immunoassay method (Beckman UniCel DxC800) using G6PDH labeling.
Collect: Urine cup
Amount to Collect: See preferred volume
Sample Type: Random urine
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Units: µg/L
Reference Interval: Negative
Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cutoff concentration of 200 µg/L
Synonyms:
- Butisol
- Alurate
- Amobarbital
- Amytal
- Apobarbital
- Butabarbital
- Butalbital
- Fiorinal
- Gemonil
- Metharbital
- Secobarbital
- Seconal
- Tuinal
Stability (from collection to initiation): Refrigerated 1 week, frozen at -20C 2 weeks
Reported: Stat 2 hours, routine 4 hours
Additional Information:
A concentration of < 200 µg/L is considered negative by this test. A positive result is >= 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.
This assay detects a number of barbiturates at varying concentrations.

Click here for List of Cross Reactive Substances
False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BARQNT. False negative results are also possible.

Barbiturates can be detected in urine from 1 up to 14 days after use (especially for phenobarbital as it is long-acting).

CPT Codes:
80301

LOINC Codes:
20664-9
Barbiturates, Urine, Quantitative
BARQNT

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Barbiturates, Urine Screen with Reflex to Quantitation (2012211) is preferred.

Performing Lab:
ARUP

Performed:
Tue, Thu, Sat

Methodology:
Quantitative Gas Chromatography-Mass Spectrometry

Reported:
1-4 days

Synonyms:
- Amobarbital
- Amobarbitone
- Amytal
- Axocet
- Butalbital
- Fioricet
- Fiorinal
- Luminal
- Nembutal
- Pain Management
- Pain Management, Barbiturates, Quantitative, with medMATCH, Urine
- Pain Management, Barbiturates, with Confirmation with medMATCH, Urine
- Pentobarbital
- Phenobarbital
- Phenobarbitone
- Quinalbarbitone
- Sandoptal
- Secobarbital
- Seconal
- Solfoton
- Tuinal

COLLECTION

Collect:
Random urine.

Amount to Collect:
3.5 mL

Preferred Volume:
3.5 mL

Minimum Volume:
1.5 mL
Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
BARQNT
ARUP Test Code:
2012213
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transfer 3.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1.5 mL)

Additional Processing Instructions:
Aliquot and freeze. Transport to CB frozen. Order ARUP test code 2012213.

Preferred Volume:
3.5 mL
Minimum Volume:
1.5 mL

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butalbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Amobarbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Pentobarbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Secobarbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>50 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Positive cutoff: 50 ng/mL
For medical purposes only; not valid for forensic use.

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.
CPT Codes:
80345 (Alt code: G0480)

LOINC:
- 3950-3
- 11071-8
- 3926-3
- 11230-0
- 19695-6

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Barbiturates, Urine Screen with Reflex to Quantitation (2012211) is preferred.

Test Code:
BARQNT

ARUP Test Code:
2012213

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Tue, Thu, Sat

Methodology:
Quantitative Gas Chromatography-Mass Spectrometry

Collect:
Random urine.

Amount to Collect:
3.5 mL

Preferred Volume:
3.5 mL

Minimum Volume:
1.5 mL

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Transfer 3.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1.5 mL)

Additional Processing Instructions:
Aliquot and freeze. Transport to CB frozen. Order ARUP test code 2012213.

Reference Interval:

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butalbital</td>
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</tr>
<tr>
<td>Pentobarbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Secobarbital</td>
<td>50 ng/mL</td>
</tr>
<tr>
<td>Phenobarbital</td>
<td>50 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:

Positive cutoff: 50 ng/mL

For medical purposes only; not valid for forensic use.
The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

Synonyms:
- Amobarbital
- Amobarbitone
- Amytal
- Axocet
- Butalbital
- Fioricet
- Fiorinal
- Luminal
- Nembutal
- Pain Management
- Pain Management, Barbiturates, Quantitative, with medMATCH, Urine
- Pain Management, Barbiturates, with Confirmation with medMATCH, Urine
- Pentobarbital
- Phenobarbital
- Phenobarbitone
- Quinalbarbitone
- Sandoptal
- Secobarbital
- Seconal
- Solfoton
- Tuinal

Storage/Transport Temperature:
Room temperature.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Reported:
1-4 days

CPT Codes:
- 80345 (Alt code: G0480)

LOINC:
- 3950-3
- 11071-8
- 3926-3
- 11230-0
- 19695-6
<table>
<thead>
<tr>
<th>Bartonella species Antibodies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORDERING</strong></td>
</tr>
<tr>
<td>Available Stat:</td>
</tr>
<tr>
<td>Performing Lab:</td>
</tr>
<tr>
<td>Methodology:</td>
</tr>
<tr>
<td>Reported:</td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
</tr>
<tr>
<td>Cross-reactions between B. henselae (H-1), the causative agent of Cat Scratch Disease, and B. quintana, the organism causing Trench Fever, are extensive. These organisms may also be responsible for c. 20% of the small number of cases of culture-negative endocarditis.</td>
</tr>
<tr>
<td>Positive results will automatically be titered by Quest at an additional charge.</td>
</tr>
<tr>
<td>Testing available only on a limited basis. CSF is NOT tested.</td>
</tr>
<tr>
<td>Reflex Testing:</td>
</tr>
<tr>
<td>Bartonella Species Antibody (IgG, IgM): If Bartonella henselae and B.Quintana IgG and IgM Screens are positive, titers are performed at an additional charge. Reflex testing will be manually billed when results are reported by Quest-Nichols Diagnostic Lab.</td>
</tr>
<tr>
<td>Synonyms:</td>
</tr>
<tr>
<td>- BA</td>
</tr>
<tr>
<td>- Bacillary angiomatosis</td>
</tr>
<tr>
<td>- Cat Scratch Disease</td>
</tr>
<tr>
<td>- CSD</td>
</tr>
<tr>
<td>- peliosis hepatitis</td>
</tr>
<tr>
<td>- Rickettsia henselae</td>
</tr>
<tr>
<td>- Rickettsia quintana</td>
</tr>
<tr>
<td>- Rochalimea</td>
</tr>
<tr>
<td><strong>COLLECTION</strong></td>
</tr>
<tr>
<td>Sample Type:</td>
</tr>
<tr>
<td>Collect:</td>
</tr>
<tr>
<td>Amount to Collect:</td>
</tr>
<tr>
<td>Preferred Volume:</td>
</tr>
<tr>
<td>Minimum Volume:</td>
</tr>
<tr>
<td><strong>PROCESSING</strong></td>
</tr>
<tr>
<td>Test Code:</td>
</tr>
<tr>
<td>Sendout:</td>
</tr>
</tbody>
</table>
Performing Lab:
Quest

Specimen Preparation:
Separate serum within 4 hours of collection. Freeze at -20C. Order Quest test # 4127N

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative: < 1:64 for IgG
Negative: < 1:16 for IgM

Additional Information:
Cross-reactions between B. henselae (H-1), the causative agent of Cat Scratch Disease, and B. quintana, the organism causing Trench Fever, are extensive. These organisms may also be responsible for c. 20% of the small number of cases of culture-negative endocarditis.

Positive results will automatically be titered by Quest at an additional charge.

Testing available only on a limited basis. CSF is NOT tested.

ADMINISTRATIVE

CPT Codes:
86611-90 x 4

LOINC Codes:
43866-3

COMPLETE VIEW

Available Stat:
No

Test Code:
BART

Performing Lab:
Quest

Sendout:
Yes

Methodology:
IFA

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Separate serum within 4 hours of collection. Freeze at -20C. Order Quest test # 4127N

Reference Interval:
Negative: < 1:64 for IgG
Negative: < 1:16 for IgM

**Synonyms:**
- BA
- Bacillary angiomatosis
- Cat Scratch Disease
- CSD
- peliosis hepatitis
- Rickettsia henselae
- Rickettsia quintana
- Rochalimea

**Reported:**
5-7 days

**Reflex Testing:**
Bartonella Species Antibody (IgG, IgM): If Bartonella henselae and B. Quintana IgG and IgM Screens are positive, titers are performed at an additional charge. Reflex testing will be manually billed when results are reported by Quest-Nichols Diagnostic Lab.

**Additional Information:**
Cross-reactions between B. henselae (H-1), the causative agent of Cat Scratch Disease, and B. quintana, the organism causing Trench Fever, are extensive. These organisms may also be responsible for c. 20% of the small number of cases of culture-negative endocarditis.

Positive results will automatically be titered by Quest at an additional charge.

Testing available only on a limited basis. CSF is NOT tested.

**CPT Codes:**
86611-90 x 4

**LOINC Codes:**
43866-3
Basic Metabolic Panel, Fasting
FBMP

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, and total calcium.
Individual tests may be ordered separately.
Synonyms:
- Chem 7, Chem 8, Chem 10, BMP

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light Green top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum

PROCESSING

Test Code:
FBMP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum

RESULT INTERPRETATION

Units:
Various (see normal ranges)
Reference Interval:
See individual test entries
Critical Values:
- Sodium <125 or >155 mmol/L
- Potassium <3.0 or >6.0 mmol/L
- CO2, Total <15 or >40 mmol/L
Glucose, neonate  <30 or > 170 mg/dL
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total  <6.5 or > 13.5 mg/dL

Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, and total calcium.
Individual tests may be ordered separately.

ADMINISTRATIVE

CPT Codes:
80048
LOINC Codes:
24321-2

COMPLETE VIEW

Available Stat:
Yes
Test Code:
FBMP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Collect:
Light Green top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Sample Type:
Plasma or serum
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum
Units:
Various (see normal ranges)
Reference Interval:
See individual test entries
Critical Values:
Sodium  <125 or > 155 mmol/L
Potassium  <3.0 or > 6.0 mmol/L
CO2, Total  <15 or > 40 mmol/L
Glucose, neonate  <30 or > 170 mg/dL
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total  <6.5 or > 13.5 mg/dL

Synonyms:
- Chem 7, Chem 8, Chem 10, BMP

Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, and total calcium.
Individual tests may be ordered separately.
CPT Codes:
80048
LOINC Codes:
24321-2
Basic Metabolic Panel, Random
NBMP

ORDERING

Available Stat: Yes
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Reported:
  STAT 1 hour, Routine 4 hours
Additional Information:
  Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, random glucose, and total calcium.
  Individual tests may be ordered separately.
Synonyms:
  • Chem 7, Chem 8, Chem 10, BMP

COLLECTION

Sample Type:
  Plasma or serum
Collect:
  Light Green top preferred, Gold top acceptable
Amount to Collect:
  4 mL blood
Preferred Volume:
  2 mL plasma or serum
Minimum Volume:
  0.5 mL plasma or serum

PROCESSING

Test Code:
  NBMP
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
  2 mL plasma or serum
Minimum Volume:
  0.5 mL plasma or serum

RESULT INTERPRETATION

Units:
  Various (see normal ranges)
Reference Interval:
  See individual test entries
Critical Values:
  Sodium  <125 or > 155 mmol/L
  Potassium <3.0 or > 6.0 mmol/L
  CO2, Total <15 or > 40 mmol/L
Glucose, neonate  <30 or > 170 mg/dL
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total  <6.5 or > 13.5 mg/dL

Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, random glucose, and total calcium.
Individual tests may be ordered separately.

ADMINISTRATIVE

CPT Codes:
80048
LOINC Codes:
24321-2

COMPLETE VIEW

Available Stat:
Yes
Test Code:
NBMP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Collect:
Light Green top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Sample Type:
Plasma or serum
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum
Units:
Various (see normal ranges)
Reference Interval:
See individual test entries
Critical Values:
Sodium  <125 or > 155 mmol/L
Potassium  <3.0 or > 6.0 mmol/L
CO2, Total  <15 or > 40 mmol/L
Glucose, neonate  <30 or > 170 mg/dL
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total  <6.5 or > 13.5 mg/dL

Synonyms:
- Chem 7, Chem 8, Chem 10, BMP

Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, random glucose, and total calcium.
Individual tests may be ordered separately.

CPT Codes:
B-Cell Crossmatch by Cytotoxicity (For Donor)
HTBXCR (Sunquest: ILBXCD)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Cytotoxicity (AHG)
Reported: Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
Synonyms:
- B-Cell Crossmatch by NIH

COLLECTION

Sample Type: ACD anticoagulated whole blood
Collect: Yellow top (ACD) x 6
Amount to Collect: 51 mL blood (see Collection Instructions)
Preferred Volume: 51 mL blood
Minimum Volume: Contact ITL
Remarks: Fill ACD (Yellow) top tubes completely. If being collected with other crossmatch testing and HLA typing, collect 8 tubes. Specimens must be received in the lab before 1000 Friday - do NOT draw between 0900 Friday and 0900 Sunday.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours
Unacceptable Conditions:
Specimen > 48 hours

PROCESSING

Test Code: HTBXCR (Sunquest: ILBXCD)
Test Group: HLA Crossmatching
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume: 51 mL blood
Minimum Volume: Contact ITL

Unacceptable Conditions:
Specimen > 48 hours

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours

ADMINISTRATIVE

CPT Codes: 86805

COMPLETE VIEW

Available Stat: Yes
Test Code: HTBXCR (Sunquest: ILBXCD)
Test Group: HLA Crossmatching
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Sendout: Yes
Methodology: Cytotoxicity (AHG)
Remarks: Fill ACD (Yellow) top tubes completely. If being collected with other crossmatch testing and HLA typing, collect 8 tubes. Specimens must be received in the lab before 1000 Friday - do NOT draw between 0900 Friday and 0900 Sunday.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Collect:
Yellow top (ACD) x 6
Amount to Collect:
51 mL blood (see Collection Instructions)
Sample Type:
ACD anticoagulated whole blood
Preferred Volume:
51 mL blood
Minimum Volume:
Contact ITL
Unacceptable Conditions:
Specimen > 48 hours
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Synonyms:
- B-Cell Crossmatch by NIH
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
CPT Codes: 86805
B-Cell Crossmatch by Cytotoxicity w/ DTT (Recipient)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Cytotoxicity
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
Synonyms:
- B-Cell Crossmatch by NIH - DTT Treated

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum
Remarks:
Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample

PROCESSING

Test Code:
ILBXDT
Test Group:
HLA Crossmatching
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum

**Unacceptable Conditions:**
Hemolyzed sample

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**ADMINISTRATIVE**

**CPT Codes:**
86805

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
ILBXDT

**Test Group:**
HLA Crossmatching

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Cytotoxicity

**Remarks:**
Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

**Collect:**
Red top

**Amount to Collect:**
6 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
4 mL serum

**Minimum Volume:**
2 mL serum

**Unacceptable Conditions:**
Hemolyzed sample

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- B-Cell Crossmatch by NIH - DTT Treated

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

**CPT Codes:**
86805
B-Cell ImmunoCompetency Panel
BCIP

ORDERING

Performing Lab:
Immunology

Performed:
Monday - Thursday, day shift

Methodology:
Flow Cytometry

Reported:
2-3 days

Synonyms:
- B-Cell ImmunoComp Panel, BCIP
- B-cell Phenotyping Profile

COLLECTION

Sample Type:
Blood

Collect:
Lavender top

Amount to Collect:
3 mL

Preferred Volume:
3 mL

Minimum Volume:
2 mL

Remarks:
Do not draw samples for this test on Friday, weekends and UCSF observed holidays. Samples drawn on the day before holidays must be received in the lab by 12 noon.

Stability (from collection to initiation):
Room temperature, within 24 hours

Unacceptable Conditions:
Refrigerated sample received. Sample > 24 hours old when received.

PROCESSING

Test Code:
BCIP

Performing Lab:
Immunology

Specimen Preparation:
DO NOT refrigerate, store at room temperature and ship to China Basin

Preferred Volume:
3 mL

Minimum Volume:
2 mL

Unacceptable Conditions:
Refrigerated sample received. Sample > 24 hours old when received.

Stability (from collection to initiation):
Room temperature, within 24 hours
RESULT INTERPRETATION

Units:
%  

Reference Interval:

%CD19+ of total lymphs 5.3 - 23.3  
%CD20+ of total lymphs 4.8 - 22.0  
%CD27+ of CD19+ B-cells 10.7 - 46.2  
%CD27+/IgM+/IgD+ of CD19+ B-cells 1.6 - 23.1  
%CD27+/IgM-/IgD- of CD19+ B-cells 4.8 - 24.9  
%CD27+/IgM+/IgD- of CD19+ B-cells 0.5 - 6.2  
%IgM+ of CD19+ B-cells 21.2 - 78.7  
%CD38+/IgM- of CD19+ B-cells 0.5 - 5.4  
%CD38+/IgM+ of CD19+ B-cells 1.0 - 8.1  
%CD21+ of CD19+ B-cells 93.7 - 100.0  
%CD21- of CD19+ B-cells 0.9 - 7.0  

Note: Reference values are for >= 18 year olds. For pediatric ranges please see:

ADMINISTRATIVE

CPT Codes:  
88184; 88185 x 6

LDT or Modified FDA:  
Yes

COMPLETE VIEW

Test Code:  
BCIP

Performing Lab:  
Immunology

Performed:  
Monday - Thursday, day shift

Methodology:  
Flow Cytometry

Remarks:  
Do not draw samples for this test on Friday, weekends and UCSF observed holidays. Samples drawn on the day before holidays must be received in the lab by 12 noon.

Collect:  
Lavender top

Amount to Collect:  
3 mL

Sample Type:  
Blood

Preferred Volume:  
3 mL

Minimum Volume:  
2 mL

Unacceptable Conditions:  
Refrigerated sample received. Sample > 24 hours old when received.

Specimen Preparation:  
DO NOT refrigerate, store at room temperature and ship to China Basin
**Units:**

- %

**Reference Interval:**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>%CD19+ of total lymphs</td>
<td>5.3 - 23.3</td>
</tr>
<tr>
<td>%CD20+ of total lymphs</td>
<td>4.8 - 22.0</td>
</tr>
<tr>
<td>%CD27+ of CD19+ B-cells</td>
<td>10.7 - 46.2</td>
</tr>
<tr>
<td>%CD27+/IgM+/IgD+ of CD19+ B-cells</td>
<td>1.6 - 23.1</td>
</tr>
<tr>
<td>%CD27+/IgM-/IgD- of CD19+ B-cells</td>
<td>4.8 - 24.9</td>
</tr>
<tr>
<td>%CD27+/IgM+/IgD- of CD19+ B-cells</td>
<td>0.5 - 6.2</td>
</tr>
<tr>
<td>%IgM+ of CD19+ B-cells</td>
<td>21.2 - 78.7</td>
</tr>
<tr>
<td>%CD38+/IgM- of CD19+ B-cells</td>
<td>0.5 - 5.4</td>
</tr>
<tr>
<td>%CD38+/IgM+ of CD19+ B-cells</td>
<td>1.0 - 8.1</td>
</tr>
<tr>
<td>%CD21+ of CD19+ B-cells</td>
<td>93.7 - 100.0</td>
</tr>
<tr>
<td>%CD21- of CD19+ B-cells</td>
<td>0.9 - 7.0</td>
</tr>
</tbody>
</table>

Note: Reference values are for >= 18 year olds. For pediatric ranges please see:

**Synonyms:**

- B-Cell ImmunoComp Panel, BCIP
- B-cell Phenotyping Profile

**Stability (from collection to initiation):**

Room temperature, within 24 hours

**Reported:**

2-3 days

**CPT Codes:**

88184; 88185 x 6

**LDT or Modified FDA:**

Yes
BCL2 18q21.3 Break Apart Rearrangement FISH
BBCL2, BCL2

ORDERING

Performing Lab:
  Cytogenetics
Performed:
  Daily weekdays
Methodology:
  FISH
Reported:
  7~14 days
Synonyms:
  • BCL2 Dual Color Break Apart Rearrangement FISH, BCL2 18q21.3 Dual Color Break Apart Rearrangement FISH, blood

COLLECTION

Sample Type:
  Blood
Collect:
  Dark Green top for bone marrow, sterile container with medium for bone core.
Amount to Collect:
  2ml blood
Preferred Volume:
  2ml blood
Minimum Volume:
  1ml blood
Remarks:
  Mix well, do not spin, keep at room temperature.
Stability (from collection to initiation):
  48 hours
Unacceptable Conditions:
  Leaking, frozen and unlabeled samples.

PROCESSING

Test Code:
  BBCL2: Blood
  BCL2: Non-blood
Test Group:
  Cytogenetics
Performing Lab:
  Cytogenetics
Specimen Preparation:
  Do not refrigerate or freeze sample, call lab before sample rejection.
Preferred Volume:
  2ml blood
Minimum Volume:
  1ml blood
Unacceptable Conditions:
  Leaking, frozen and unlabeled samples.
Stability (from collection to initiation):
  48 hours
CPT Codes:
88271x1, 88271x1, 88275x1

LDT or Modified FDA:
Yes

Test Code:
BBCL2: Blood
BCL2: Non-blood

Test Group:
Cytogenetics

Performing Lab:
Cytogenetics

Performed:
Daily weekdays

Methodology:
FISH

Remarks:
Mix well, do not spin, keep at room temperature.

Collect:
Dark Green top for bone marrow, sterile container with medium for bone core.

Amount to Collect:
2ml blood

Sample Type:
Blood

Preferred Volume:
2ml blood

Minimum Volume:
1ml blood

Unacceptable Conditions:
Leaking, frozen and unlabeled samples.

Specimen Preparation:
Do not refrigerate or freeze sample, call lab before sample rejection.

Synonyms:
- BCL2 Dual Color Break Apart Rearrangement FISH, BCL2 18q21.3 Dual Color Break Apart Rearrangement FISH, blood

Stability (from collection to initiation):
48 hours

Reported:
7~14 days

CPT Codes:
88271x1, 88271x1, 88275x1

LDT or Modified FDA:
Yes
BCL6 Chromosome 3Q27 Rearrangement FISH
BCL6, BBCL6

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescence in situ Hybridization (break apart FISH)
Reported: 1-2 weeks
Synonyms:
- BCL6
- BBCL6

COLLECTION

Sample Type: Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy
Collect: Dark green top vacutainer
Amount to Collect:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm
Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm
Minimum Volume:
- Whole blood: 1 ml
- Bone marrow: 1 ml
- Bone core: 1 cm
Remarks: Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature
Stability (from collection to initiation): 2 days
Unacceptable Conditions: Frozen cracked, leaking or unlabeled samples

PROCESSING

Test Code:
- BBCL6: Blood
- BCL6: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm
Minimum Volume:
- Whole blood: 1 ml
Bone marrow: 1 ml
?Bone core: 1 cm

Unacceptable Conditions:
Frozen cracked, leaking or unlabeled samples

Stability (from collection to initiation):
2 days

ADMINISTRATIVE

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
BBCL6: Blood
BCL6: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Methodology:
Fluorescence in situ Hybridization (break apart FISH)

Remarks:
Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature

Collect:
Dark green top vacutainer

Amount to Collect:
Whole blood: 2 ml
Bone marrow: 2 ml
Bone core: 2 cm

Sample Type:
Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy

Preferred Volume:
Whole blood: 2 ml
Bone marrow: 2 ml
?Bone core: 2 cm

Minimum Volume:
Whole blood: 1 ml
Bone marrow: 1 ml
?Bone core: 1 cm

Unacceptable Conditions:
Frozen cracked, leaking or unlabeled samples

Synonyms:
• BCL6
• BBCL6

Stability (from collection to initiation):
2 days

Reported:
1-2 weeks

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes
BCR/ABL Quantitative

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 2x per week, Monday & Wednesday, day shift only

Methodology:
RT-PCR

Reported:
7-10 days

Additional Information:

A reciprocal translocation between chromosomes 9 and 22 results in the Philadelphia chromosome, which is commonly associated with chronic myelogenous leukemia (CML) and to a lesser extent with acute lymphocytic leukemia (ALL) or occasionally acute myeloid leukemia (AML). The oncogenic culprit of the Philadelphia chromosome stems from the fusion of two genes BCR and ABL1, located on chromosomes 22 and 9, respectively. The resulting BCR-ABL1 fusion gene produces an abnormal protein with increased tyrosine kinase activity that activates multiple intracellular signaling pathways, culminating in excessive growth of hematopoietic cells.

Three different variants of the BCR-ABL1 fusion gene correspond to the major, minor and micro breakpoints, which encode respectively for the p210, p190 and p230 proteins, all of which are detected by this assay. The majority of CML patients carry the p210 translocation, whereas the p190 translocation is present in approximately 20% of ALL patients and occasionally in AML. While the p230 translocation has also been detected in classic CML, it has also been found in a subset of patients with chronic neutrophilic leukemia (CNL).

Treatment of patients with CML and ALL is aimed at the eradication of BCR-ABL1 positive tumor cells with tyrosine kinase inhibitors and minimal residual disease monitoring of the therapy effectiveness is achieved by this assay with the quantitative monitoring of BCR-ABL1 mRNA expression.

This PCR based test will detect and quantitate the p210, p190 and p230 BCR-ABL1 translocations. The assay sensitivity is about 1 in 100,000 BCR-ABL1 positive K562 cells and spans 4-5 logs. Results are reported as on the Internal Scale (IS) for p210 (b3a2, b2a2) and as percent ratios for p190 (e1a2) and p230 (e19a2) translocations. Results of minimal residual disease testing are best interpreted in light of previous results obtained from the same laboratory. Inter-laboratory comparison of percent ratios is variable and may not be reliable.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:

- PCR
- CML
- Chronic myelogenous leukemia
- Philadelphia chromosome
- PH1 chromosome
- Breakpoint cluster region
- Tyrosine kinase
- Translocation 9:22
- t(9;22)
- Ph’ chromosome
- ALL
COLLECTION

Sample Type:
- EDTA whole blood, Marrow

Collect:
- Lavender top

Amount to Collect:
- Blood: 5 mL
- BM Aspirate: 2 mL

Preferred Volume:
- Blood: 5 mL
- BM Aspirate: 2 mL

Minimum Volume:
- Blood: 2 mL
- BM aspirate: 1 mL

Remarks:
- Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):
- Refrigerated 3 days.

Unacceptable Conditions:
- Heparinized samples

PROCESSING

Test Code:
- BCRABL

Test Group:
- BCRABL

Performing Lab:
- Medical Genomics - Molecular Diagnostics

Specimen Preparation:
- Do not centrifuge. Refrigerate sample, DO NOT freeze.

Preferred Volume:
- Blood: 5 mL
- BM Aspirate: 2 mL

Minimum Volume:
- Blood: 2 mL
- BM aspirate: 1 mL

Unacceptable Conditions:
- Heparinized samples

Stability (from collection to initiation):
- Refrigerated 3 days.

RESULT INTERPRETATION

Units:
- Ratio bcr:abl/abl (%)

Reference Interval:
- No bcr:abl transcripts (0%)

Additional Information:
A reciprocal translocation between chromosomes 9 and 22 results in the Philadelphia chromosome, which is commonly associated with chronic myelogenous leukemia (CML) and to a lesser extent with acute lymphocytic leukemia (ALL) or occasionally acute myeloid leukemia (AML). The oncogenic culprit of the Philadelphia chromosome stems from the fusion of two genes BCR and ABL1, located on chromosomes 22 and 9, respectively. The resulting BCR-ABL1 fusion gene produces an abnormal protein with increased tyrosine...
kinase activity that activates multiple intracellular signaling pathways, culminating in excessive growth of hematopoietic cells.

Three different variants of the BCR-ABL1 fusion gene correspond to the major, minor and micro breakpoints, which encode respectively for the p210, p190 and p230 proteins, all of which are detected by this assay. The majority of CML patients carry the p210 translocation, whereas the p190 translocation is present in approximately 20% of ALL patients and occasionally in AML. While the p230 translocation has also been detected in classic CML, it has also been found in a subset of patients with chronic neutrophilic leukemia (CNL).

Treatment of patients with CML and ALL is aimed at the eradication of BCR-ABL1 positive tumor cells with tyrosine kinase inhibitors and minimal residual disease monitoring of the therapy effectiveness is achieved by this assay with the quantitative monitoring of BCR-ABL1 mRNA expression.

This PCR based test will detect and quantitate the p210, p190 and p230 BCR-ABL1 translocations. The assay sensitivity is about 1 in 100,000 BCR-ABL1 positive K562 cells and spans 4-5 logs. Results are reported as on the Internal Scale (IS) for p210 (b3a2, b2a2) and as percent ratios for p190 (e1a2) and p230 (e19a2) translocations. Results of minimal residual disease testing are best interpreted in light of previous results obtained from the same laboratory. Inter-laboratory comparison of percent ratios is variable and may not be reliable.

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**ADMINISTRATIVE**

**CPT Codes:**
81206, 81207, 81208

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
46434-7

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**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
BCRABL

**Test Group:**
BCRABL

**Performing Lab:**
Medical Genomics - Molecular Diagnostics

**Performed:**
Run 2x per week, Monday & Wednesday, day shift only

**Methodology:**
RT-PCR

**Remarks:**
Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Collect:**
Lavender top

**Amount to Collect:**
Blood: 5 mL  
BM Aspirate: 2 mL

**Sample Type:**
EDTA whole blood, Marrow

**Preferred Volume:**
Blood: 5 mL
BM Aspirate: 2 mL

Minimum Volume:
Blood: 2 mL
BM aspirate: 1 mL

Unacceptable Conditions:
Heparinized samples

Specimen Preparation:
Do not centrifuge. Refrigerate sample, DO NOT freeze.

Units:
Ratio bcr:abl/abl (%)

Reference Interval:
No bcr:abl transcripts (0%)

Synonyms:
- PCR
- CML
- Chronic mylogenous leukemia
- Philadelphia chromosome
- PH1 chromosome
- Breakpoint cluster region
- Tyrosine kinase
- Translocation 9:22
- t(9:22)
- Ph' chromosome
- ALL

Stability (from collection to initiation):
Refrigerated 3 days.

Reported:
7-10 days

Additional Information:
A reciprocal translocation between chromosomes 9 and 22 results in the Philadelphia chromosome, which is commonly associated with chronic myelogenous leukemia (CML) and to a lesser extent with acute lymphocytic leukemia (ALL) or occasionally acute myeloid leukemia (AML). The oncogenic culprit of the Philadelphia chromosome stems from the fusion of two genes BCR and ABL1, located on chromosomes 22 and 9, respectively. The resulting BCR-ABL1 fusion gene produces an abnormal protein with increased tyrosine kinase activity that activates multiple intracellular signaling pathways, culminating in excessive growth of hematopoietic cells.

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Treatment of patients with CML and ALL is aimed at the eradication of BCR-ABL1 positive tumor cells with tyrosine kinase inhibitors and minimal residual disease monitoring of the therapy effectiveness is achieved by this assay with the quantitative monitoring of BCR-ABL1 mRNA expression.

This PCR based test will detect and quantitate the p210, p190 and p230 BCR-ABL1 translocations. The assay sensitivity is about 1 in 100,000 BCR-ABL1 positive K562 cells and spans 4-5 logs. Results are reported as on the Internal Scale (IS) for p210 (b3a2, b2a2) and as percent ratios for p190 (e1a2) and p230 (e19a2) translocations. Results of minimal residual disease testing are best interpreted in light of previous results obtained from the same laboratory. Inter-laboratory comparison of percent ratios is variable and may not be reliable.

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An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
81206, 81207, 81208

LDT or Modified FDA:
Yes

LOINC Codes:
46434-7
BCR/ABL translocation FISH
TR922, BT922

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up Monday-Friday only.
Methodology:
Fluorescent in-situ hybridization
Reported:
2-5 days
Synonyms:
- PCR
- CML
- Chronic mylogenous leukemia
- Philadelphia chromosome
- PH1 chromosome
- Breakpoint cluster region
- Tyrosine kinase
- Translocation 9:22
- t(9:22)
- Ph' chromosome
- ALL
- Cytogenetic analysis
- Karyotype
- Karyotyping
- TR922
- BT922

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable
Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.
Amount to Collect:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm
Preferred Volume:
Bone marrow: 2 mL
Blood: 2 mL
?Bone core: 2 cm
Minimum Volume:
   Bone marrow: 1 mL
   Blood: 1 mL
   ?Bone core: 1 cm

Stability (from collection to initiation):
   48 hours

Unacceptable Conditions:
   Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
   BT922: Blood
   TR922: Bone marrow

Test Group:
   BCRABL

Performing Lab:
   Medical Genomics - Cytogenetics

Specimen Preparation:
   Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Preferred Volume:
   Bone marrow: 2 mL
   Blood: 2 mL
   ?Bone core: 2 cm 

Minimum Volume:
   Bone marrow: 1 mL
   Blood: 1 mL
   ?Bone core: 1 cm

Unacceptable Conditions:
   Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
   48 hours

RESULT INTERPRETATION

Reference Interval:
   Not detected

ADMINISTRATIVE

CPT Codes:
   88271ZS, 88275ZS

LDT or Modified FDA:
   Yes

LOINC Codes:
   51867-0

COMPLETE VIEW

Available Stat:
   No

Test Code:
   BT922: Blood
   TR922: Bone marrow

Test Group:
   BCRABL
Performing Lab:  
Medical Genomics - Cytogenetics

Performed:  
Set up Monday-Friday only.

Methodology:  
Fluorescent in-situ hybridization

Collect:  
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.

Amount to Collect:  
Bone marrow: 2 mL  
Blood: 2 mL  
Bone core: 2 cm

Sample Type:  
Heparinized whole blood, bone marrow, bone core

Preferred Volume:  
Bone marrow: 2 mL  
Blood: 2 mL  
Bone core: 2 cm

Minimum Volume:  
Bone marrow: 1 mL  
Blood: 1 mL  
Bone core: 1 cm

Unacceptable Conditions:  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:  
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:  
Not detected

Synonyms:  
- PCR  
- CML  
- Chronic mylogenous leukemia  
- Philadelphia chromosome  
- PH1 chromosome  
- Breakpoint cluster region  
- Tyrosine kinase  
- Translocation 9:22  
- t(9:22)  
- Ph' chromosome  
- ALL  
- Cytogenetic analysis  
- Karyotype  
- Karyotyping  
- TR922  
- BT922

Stability (from collection to initiation):  
48 hours

Reported:  
2-5 days
CPT Codes:
  88271ZS, 88275ZS
LDT or Modified FDA:
  Yes
LOINC Codes:
  51867-0
Beckwith-Wiedemann Syndrome
MOLT

ORDERING

Approval Required:
Yes

Available Stat:
No

Performing Lab:
Mayo

Methodology:
Methylation-sensitive multiple ligation-dependent probe amplification is utilized to test for the presence of large deletions, duplications, and methylation defects in the imprinting center 1 (IC1) (H19) and IC2 (LIT1) critical regions on chromosome 11p15.

Reported:
2 weeks

Additional Information:

Beckwith-Wiedemann syndrome (BWS) is a disorder characterized by prenatal and/or postnatal overgrowth, neonatal hypoglycemia, congenital malformations, and an increased risk for embryonal tumors. Physical findings are variable and can include abdominal wall defects, macroglossia, and hemihyperplasia. The predisposition for tumor development is associated with specific tumor types such as adrenal carcinoma, nephroblastoma (Wilms tumor), hepatoblastoma, and rhabdomyosarcoma. In infancy, BWS has a mortality rate of approximately 20%.

Current data suggest that the etiology of BWS is due to dysregulation of imprinted genes in the 11p15 region of chromosome 11, including H19 (maternally expressed), LIT1 (official symbol KCNQ1OT1; paternally expressed), IGF2 (paternally expressed), and CDKN1C (aliases p57 and KIP2; maternally expressed). Expression of these genes is controlled by 2 imprinting centers (IC).

Approximately 85% of BWS cases appear to be sporadic, while 15% of cases are associated with an autosomal dominant inheritance pattern. When a family history is present, the etiology is often due to inherited point mutations in CDKN1C or an unknown cause. The etiology of sporadic cases includes:

- Hypomethylation of imprinting center 2 (IC2) (LIT1): approximately 50% to 60%
- Paternal uniparental disomy of chromosome 11: approximately 10% to 20%
- Hypermethylation of imprinting center 1 (IC1) (H19): approximately 2% to 7%
- Unknown: approximately 10% to 20% - Point mutation in CDKN1C: approximately 5% to 10%
- Cytogenetic abnormality: approximately 1% to 2%
- Differentially methylated region 1 (DMR1) or DMR2 microdeletion: rare

The clinical presentation of BWS is dependent on which gene in the 11p15 region is involved. The risk for cancer has been shown to be significantly higher in patients with abnormal methylation of IC1 (H19) versus IC2 (LIT1). In patients with abnormal methylation of IC2 (LIT1), abdominal wall defects and overgrowth are seen at a higher frequency. Russell-Silver syndrome (RSS) is a rare genetic condition with an incidence of approximately 1 in 100,000. RSS is characterized by pre- and postnatal growth retardation with normal head circumference, characteristic facies, fifth finger clinodactyly, and asymmetry of the face, body, and/or limbs. Less commonly observed clinical features include cafe au lait spots, genitourinary anomalies, motor, speech, cognitive delays, and hypoglycemia.

Although clinical diagnostic criteria have been developed, it has been demonstrated that many patients with molecularly confirmed RSS do not meet strict clinical diagnostic criteria for RSS. Therefore, most groups recommend a relatively low threshold for considering molecular testing in suspected cases of RSS.

RSS is a genetically heterogeneous condition that is associated with genetic and epigenetic alterations at chromosome 7 and the chromosome 11p15.5 region. The majority of cases of RSS are sporadic, although familial cases have been reported. The etiology of sporadic cases of RSS includes:

- Hypomethylation of IC1 (H19): approximately 30% to 50%
- Maternal uniparental disomy (UPD) of chromosome 7: approximately 5% to 10%*
- 11p15.5 duplications: rare
- Chromosome 7 duplications: rare*

*Note that this test does not detect chromosome 7 UPD. However, testing is available; order UNIPD / Uniparental Disomy.

The clinical phenotype of RSS has been associated with the specific underlying molecular etiology. Patients with hypomethylation of IC1 (H19) are more likely to exhibit "classic" RSS phenotype (ie, severe intrauterine growth retardation, postnatal growth retardation, and
asymmetry), while patients with maternal UPD7 often show a milder clinical phenotype. Despite these general genotype-phenotype correlations, many exceptions have been reported.

Methylation abnormalities of IC1 (H19) and IC2 (LIT1) can be detected by methylation-sensitive multiple ligation-dependent probe amplification. While testing can determine methylation status, it does not identify the mechanism responsible for the methylation defect (such as paternal uniparental disomy or cytogenetic abnormalities). Hypomethylation of IC2 (LIT1) is hypothesized to silence the expression of a number of maternally expressed genes, including CDKN1C. Hypermethylation of IC1 is hypothesized to silence the expression of H19, while also resulting in overexpression of IGF2. Absence of CDKN1C and H19 expression, in addition to overexpression of IGF2, is postulated to contribute to the clinical phenotype of BWS. Hypomethylation of IC1 is hypothesized to result in overexpression of H19 and underexpression of the IGF2, which is thought to contribute to the clinical phenotype of RSS.

Synonyms:
- BWS
- Overgrowth Disorder
- Imprinted disorder
- macroglossia
- LIT1

**COLLECTION**

**Sample Type:**
- EDTA Whole blood, Cultured amniocytes, cultured chorionic villi

**Collect:**
- Lavender top

**Amount to Collect:**
- 5 mL blood

**Preferred Volume:**
- Blood: 5 mL
- Cultured amniocytes: 2x T25 flasks, 80% confluent
- Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Minimum Volume:**
- Blood: 3 mL
- Cultured amniocytes: 2x T25 flasks, 80% confluent
- Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Unacceptable Conditions:**
- Blood collected in heparin. Deficient confluency in cultured cell flasks.

**PROCESSING**

**Test Code:**
- MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Sendout:**
- Yes

**Performing Lab:**
- Mayo

**Specimen Preparation:**
- Do not centrifuge. Do not freeze. Refrigerate sample

**Preferred Volume:**
- Blood: 5 mL
- Cultured amniocytes: 2x T25 flasks, 80% confluent
- Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Minimum Volume:**
- Blood: 3 mL
- Cultured amniocytes: 2x T25 flasks, 80% confluent
- Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Unacceptable Conditions:**
- Blood collected in heparin. Deficient confluency in cultured cell flasks.
Beckwith-Wiedemann syndrome (BWS) is a disorder characterized by prenatal and/or postnatal overgrowth, neonatal hypoglycemia, congenital malformations, and an increased risk for embryonal tumors. Physical findings are variable and can include abdominal wall defects, macroglossia, and hemihyperplasia. The predisposition for tumor development is associated with specific tumor types such as adrenal carcinoma, nephroblastoma (Wilms tumor), hepatoblastoma, and rhabdomyosarcoma. In infancy, BWS has a mortality rate of approximately 20%.

Current data suggest that the etiology of BWS is due to dysregulation of imprinted genes in the 11p15 region of chromosome 11, including H19 (maternally expressed), LIT1 (official symbol KCNQ1OT1; paternally expressed), IGF2 (paternally expressed), and CDKN1C (aliases p57 and KIP2; maternally expressed). Expression of these genes is controlled by 2 imprinting centers (IC).

Approximately 85% of BWS cases appear to be sporadic, while 15% of cases are associated with an autosomal dominant inheritance pattern. When a family history is present, the etiology is often due to inherited point mutations in CDKN1C or an unknown cause. The etiology of sporadic cases includes:

- Hypomethylation of imprinting center 2 (IC2) (LIT1): approximately 50% to 60%
- Paternal uniparental disomy of chromosome 11: approximately 10% to 20%
- Hypermethylation of imprinting center 1 (IC1) (H19): approximately 2% to 7%
- Unknown: approximately 10% to 20% -Point mutation in CDKN1C: approximately 5% to 10%
- Cytogenetic abnormality: approximately 1% to 2%
- Differentially methylated region 1 (DMR1) or DMR2 microdeletion: rare

The clinical presentation of BWS is dependent on which gene in the 11p15 region is involved. The risk for cancer has been shown to be significantly higher in patients with abnormal methylation of IC1 (H19) versus IC2 (LIT1). In patients with abnormal methylation of IC2 (LIT1), abdominal wall defects and overgrowth are seen at a higher frequency. Russell-Silver syndrome (RSS) is a rare genetic condition with an incidence of approximately 1 in 100,000. RSS is characterized by pre- and postnatal growth retardation with normal head circumference, characteristic facies, fifth finger clinodactyly, and asymmetry of the face, body, and/or limbs. Less commonly observed clinical features include cafe au lait spots, genitourinary anomalies, motor, speech, cognitive delays, and hypoglycemia. Although clinical diagnostic criteria have been developed, it has been demonstrated that many patients with molecularly confirmed RSS do not meet strict clinical diagnostic criteria for RSS. Therefore, most groups recommend a relatively low threshold for considering molecular testing in suspected cases of RSS.

RSS is a genetically heterogeneous condition that is associated with genetic and epigenetic alterations at chromosome 7 and the chromosome 11p15.5 region. The majority of cases of RSS are sporadic, although familial cases have been reported. The etiology of sporadic cases of RSS includes:

- Hypomethylation of IC1 (H19): approximately 30% to 50%
- Maternal uniparental disomy (UPD) of chromosome 7: approximately 5% to 10%* 
- 11p15.5 duplications: rare
- Chromosome 7 duplications: rare*

*Note that this test does not detect chromosome 7 UPD. However, testing is available; order UNIPD / Uniparental Disomy.

The clinical phenotype of RSS has been associated with the specific underlying molecular etiology. Patients with hypomethylation of IC1 (H19) are more likely to exhibit "classic" RSS phenotype (ie, severe intrauterine growth retardation, postnatal growth retardation, and asymmetry), while patients with maternal UPD7 often show a milder clinical phenotype. Despite these general genotype-phenotype correlations, many exceptions have been reported.

Methylation abnormalities of IC1 (H19) and IC2 (LIT1) can be detected by methylation-sensitive multiple ligation-dependent probe amplification. While testing can determine methylation status, it does not identify the mechanism responsible for the methylation defect (such as paternal uniparental disomy or cytogenetic abnormalities). Hypomethylation of IC2 (LIT1) is hypothesized to silence the expression of a number of maternally expressed genes, including CDKN1C. Hypermethylation of IC1 is hypothesized to silence the expression of H19, while also resulting in overexpression of IGF2. Absence of CDKN1C and H19 expression, in addition to overexpression of IGF2, is postulated to contribute to the clinical phenotype of BWS. Hypomethylation of IC1 is hypothesized to result in overexpression of H19 and underexpression of the IGF2, which is thought to contribute to the clinical phenotype of RSS.
**Available Stat:**
No

**Test Code:**
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Performing Lab:**
Mayo

**Sendout:**
Yes

**Methodology:**
Methylation-sensitive multiple ligation-dependent probe amplification is utilized to test for the presence of large deletions, duplications, and methylation defects in the imprinting center 1 (IC1) (H19) and IC2 (LIT1) critical regions on chromosome 11p15.

**Collect:**
Lavender top

**Amount to Collect:**
5 mL blood

**Sample Type:**
EDTA Whole blood, Cultured amniocytes, cultured chorionic villi

**Preferred Volume:**
Blood: 5 mL
Cultured amniocytes: 2x T25 flasks, 80% confluent
Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Minimum Volume:**
Blood: 3 mL
Cultured amniocytes: 2x T25 flasks, 80% confluent
Cultured chorionic villi: 2x T25 flasks, 80% confluent

**Unacceptable Conditions:**
Blood collected in heparin. Deficient confluency in cultured cell flasks.

**Specimen Preparation:**
Do not centrifuge. Do not freeze. Refrigerate sample

**Synonyms:**
- BWS
- Overgrowth Disorder
- Imprinted disorder
- macroglossia
- LIT1

**Reported:**
2 weeks

**Additional Information:**
Beckwith-Wiedemann syndrome (BWS) is a disorder characterized by prenatal and/or postnatal overgrowth, neonatal hypoglycemia, congenital malformations, and an increased risk for embryonal tumors. Physical findings are variable and can include abdominal wall defects, macroglossia, and hemihyperplasia. The predisposition for tumor development is associated with specific tumor types such as adrenal carcinoma, nephroblastoma (Wilms tumor), hepatoblastoma, and rhabdomyosarcoma. In infancy, BWS has a mortality rate of approximately 20%.

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- Unknown: approximately 10% to 20% - Point mutation in CDKN1C: approximately 5% to 10%
- Cytogenetic abnormality: approximately 1% to 2%
- Differentially methylated region 1 (DMR1) or DMR2 microdeletion: rare
The clinical presentation of BWS is dependent on which gene in the 11p15 region is involved. The risk for cancer has been shown to be significantly higher in patients with abnormal methylation of IC1 (H19) versus IC2 (LIT1). In patients with abnormal methylation of IC2 (LIT1), abdominal wall defects and overgrowth are seen at a higher frequency. Russell-Silver syndrome (RSS) is a rare genetic condition with an incidence of approximately 1 in 100,000. RSS is characterized by pre- and postnatal growth retardation with normal head circumference, characteristic facies, fifth finger clinodactyly, and asymmetry of the face, body, and/or limbs. Less commonly observed clinical features include cafe au lait spots, genitourinary anomalies, motor, speech, cognitive delays, and hypoglycemia. Although clinical diagnostic criteria have been developed, it has been demonstrated that many patients with molecularly confirmed RSS do not meet strict clinical diagnostic criteria for RSS. Therefore, most groups recommend a relatively low threshold for considering molecular testing in suspected cases of RSS.

RSS is a genetically heterogeneous condition that is associated with genetic and epigenetic alterations at chromosome 7 and the chromosome 11p15.5 region. The majority of cases of RSS are sporadic, although familial cases have been reported. The etiology of sporadic cases of RSS includes:

- Hypomethylation of IC1 (H19): approximately 30% to 50%
- Maternal uniparental disomy (UPD) of chromosome 7: approximately 5% to 10%
- 11p15.5 duplications: rare
- Chromosome 7 duplications: rare

*Note that this test does not detect chromosome 7 UPD. However, testing is available; order UNIPD / Uniparental Disomy.

The clinical phenotype of RSS has been associated with the specific underlying molecular etiology. Patients with hypomethylation of IC1 (H19) are more likely to exhibit “classic” RSS phenotype (ie, severe intrauterine growth retardation, postnatal growth retardation, and asymmetry), while patients with maternal UPD7 often show a milder clinical phenotype. Despite these general genotype-phenotype correlations, many exceptions have been reported.

Methylation abnormalities of IC1 (H19) and IC2 (LIT1) can be detected by methylation-sensitive multiple ligation-dependent probe amplification. While testing can determine methylation status, it does not identify the mechanism responsible for the methylation defect (such as paternal uniparental disomy or cytogenetic abnormalities). Hypomethylation of IC2 (LIT1) is hypothesized to silence the expression of a number of maternally expressed genes, including CDKN1C. Hypermethylation of IC1 is hypothesized to silence the expression of H19, while also resulting in overexpression of IGF2. Absence of CDKN1C and H19 expression, in addition to overexpression of IGF2, is postulated to contribute to the clinical phenotype of BWS. Hypomethylation of IC1 is hypothesized to result in overexpression of H19 and underexpression of the IGF2, which is thought to contribute to the clinical phenotype of RSS.
Benzodiazepines Screen, Urine

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Beta-glucuronidase treatment followed by competitive enzyme immunoassay method (Beckman UniCel DxC800 analyzer)
Reported: Stat 2 hours, routine 4 hours
Additional Information: A level < 200 µg/L is considered negative by this test. A positive result is >= 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects a number of benzodiazepines at varying concentrations.

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BNZQNT. False negative results are also possible.

Benzodiazepines can be detected from 6 hours up to 14 days after a single use (Negrusz A et al, Elimination of 7-aminoclonazepam in urine after a single dose of clonazepam. Anal Bioanal Chem, 2003, 376:123-130) and for longer in chronic users (French D et al, Choosing the right benzodiazepine assay: impact on clinical decision making. Lab Medicine, 2010, 41(4):2-6)

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Stability (from collection to initiation): Refrigerated 1 week, frozen at -20C 2 weeks

PROCESSING

Test Code: BENZ
Test Group: Benzodiazepine
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20°C 2 weeks

RESULT INTERPRETATION

Reference Interval:
Negative
Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cutoff concentration of 200 µg/L

Additional Information:
A level < 200 µg/L is considered negative by this test. A positive result is >= 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects a number of benzodiazepines at varying concentrations.

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BNZQNT. False negative results are also possible.

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ADMINISTRATIVE

CPT Codes:
80301

LOINC Codes:
14316-4

COMPLETE VIEW

Available Stat:
Yes

Test Code:
BENZ

Test Group:
Benzodiazepine

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Beta-glucuronidase treatment followed by competitive enzyme immunoassay method (Beckman UniCel DxC800 analyzer)

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine

Reference Interval:
Negative
Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cutoff concentration of 200 µg/L

Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20°C 2 weeks

Reported:
Stat 2 hours, routine 4 hours

Additional Information:
A level < 200 µg/L is considered negative by this test. A positive result is >= 200 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This assay detects a number of benzodiazepines at varying concentrations.

Click here for List of Cross Reactive Substances

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmatory test code BNZONT. False negative results are also possible.

Benzodiazepines can be detected from 6 hours up to 14 days after a single use (Negrusz A et al, Elimination of 7-aminoclonazepam in urine after a single dose of clonazepam. Anal Bioanal Chem, 2003, 376:123-130) and for longer in chronic users (French D et al, Choosing the right benzodiazepine assay: impact on clinical decision making. Lab Medicine, 2010, 41(4):2-6)

CPT Codes:
80301

LOINC Codes:
14316-4
Benzodiazepines, Urine, Quantitative
BNZQNT

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Benzodiazepines Urine Screen with Reflex to Quantitation (2012225) is preferred.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- Pain Management, Benzodiazepines, Quantitative, w/ medMATCH, Urine (Drugs of Abuse Confirmation/Quan
- Pain Management, Benzodiazepines, w/Confirmation w/med MATACH, Urine (Drugs of Abuse Confirmation/Qu

COLLECTION

Collect:
Random urine.

Amount to Collect:
0.5 mL

Preferred Volume:
0.5 mL

Minimum Volume:
0.3 mL

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
BNZQNT

ARUP Test Code:
2008291

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transfer 0.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Additional Processing Instructions:
Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 2008291.

Preferred Volume:
0.5 mL
Minimum Volume: 0.3 mL

Unacceptable Conditions: Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation): Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature: Room temperature.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alprazolam</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Alpha-hydroxyalprazolam</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Chlordiazepoxide</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Clonazepam</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>7-amino-clonazepam</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Diazepam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Midazolam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Alpha-hydroxymidazolam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Nordiazepam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Oxazepam</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Temazepam</td>
<td>20 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:

Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Drugs covered: alprazolam, alpha-hydroxyalprazolam, chlordiazepoxide, clonazepam, 7-amino-clonazepam, diazepam, lorazepam, midazolam, alpha-hydroxymidazolam, nordiazepam, oxazepam and temazepam.

Positive cutoff: 20 ng/mL unless specified below:
Alprazolam 5 ng/mL
Alpha-hydroxyalprazolam 5 ng/mL
Clonazepam 5 ng/mL
7-amino-clonazepam 5 ng/mL

For medical purposes only; not valid for forensic use.

Identification of specific drug(s) taken by specimen donor is problematic due to common metabolites, some of which are prescription drugs themselves. The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:
80346 (Alt code: G0480)

LOINC:
- 16227-1
- 3886-9
- 20559-1
- 16228-9
Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Benzodiazepines Urine Screen with Reflex to Quantitation (2012225) is preferred.

Test Code:
BNZQNT

ARUP Test Code:
2008291

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Collect:
Random urine.

Amount to Collect:
0.5 mL

Preferred Volume:
0.5 mL

Minimum Volume:
0.3 mL

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Transfer 0.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Additional Processing Instructions:
Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 2008291.

Reference Interval:

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</tr>
<tr>
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<td>20 ng/mL</td>
</tr>
<tr>
<td>Nordiazepam</td>
<td>20 ng/mL</td>
</tr>
</tbody>
</table>
Oxazepam 20 ng/mL
Temazepam 20 ng/mL

Interpretive Data:
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Drugs covered: alprazolam, alpha-hydroxyalprazolam, chlordiazepoxide, clonazepam, 7-aminoclonazepam, diazepam, lorazepam, midazolam, alpha-hydroxymidazolam, nordiazepam, oxazepam and temazepam.

Positive cutoff: 20 ng/mL unless specified below:
Alprazolam 5 ng/mL
Alpha-hydroxyalprazolam 5 ng/mL
Clonazepam 5 ng/mL
7-aminoclonazepam 5 ng/mL

For medical purposes only; not valid for forensic use.

Identification of specific drug(s) taken by specimen donor is problematic due to common metabolites, some of which are prescription drugs themselves. The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

Synonyms:
- Pain Management, Benzodiazepines, Quantitative, w/ medMATCH, Urine (Drugs of Abuse Confirmation/Quan
- Pain Management, Benzodiazepines, w/Confirmation w/med MATACH, Urine (Drugs of Abuse Confirmation/Qu

Storage/Transport Temperature:
Room temperature.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Reported:
1-4 days

CPT Codes:
80346 (Alt code: G0480)

LOINC:
- 16227-1
- 3886-9
- 20559-1
- 16228-9
- 17088-6
- 59615-5
- 16348-5
- 16229-7
- 51776-3
- 16233-9
- 20522-9
- 59590-0
Beta Amyloid 42/Tau Protein Analysis, CSF
ABTAU

ORDERING

Approval Required:
Yes, for inpatient test requests
Available Stat:
No
Performing Lab:
Athena
Methodology:
ELISA
Reported:
2 weeks
Synonyms:
• AB42
• Alzheimer’s

COLLECTION

Sample Type:
CSF
Collect:
Special polypropylene tube
Amount to Collect:
2 mL CSF
Preferred Volume:
2 mL CSF
Minimum Volume:
2 mL CSF
Remarks:
CSF must be collected in special polypropylene transport tube. These tubes can be obtained from the Parnassus Clinical Laboratory Specimen Receiving Desk (M-521; 415-353-1667) or from the Memory and Aging Center (1500 Owens St., Suite 320; San Francisco, CA 94158; Phone: 415-353-2057). Please request a special polypropylene tube for Beta Amyloid 42/Tau Protein Analysis, CSF.

Sample must be accompanied with completed Athena Test Requisition when submitted to the Clinical Laboratory.

Click here for Athena requisition form

For outpatients download the Neurology PDF form for Commercial Insurance or Self-pay. For inpatients download the Neurology PDF form for Hospitals, Labs and Clinics.

Unacceptable Conditions:
Samples not collected in special polypropylene tube.

PROCESSING

Test Code:
ABTAU
Sendout:
Yes
Performing Lab:
Athena
Specimen Preparation:
DO NOT TRANSFER SAMPLE TO ANOTHER TUBE! Sample must remain in the special polypropylene tube in which it was
collected. Refrigerate if necessary for a maximum of 24 hours. Transport to CB frozen. Ship to Athena frozen. Use Athena test code #177.

**Preferred Volume:**
- 2 mL CSF

**Minimum Volume:**
- 2 mL CSF

**Unacceptable Conditions:**
- Samples not collected in special polypropylene tube.

**ADMINISTRATIVE**

**CPT Codes:**
- 83520-90 x 3

**COMPLETE VIEW**

**Approval Required:**
- Yes, for inpatient test requests

**Available Stat:**
- No

**Test Code:**
- ABTAU

**Performing Lab:**
- Athena

**Sendout:**
- Yes

**Methodology:**
- ELISA

**Remarks:**
- CSF must be collected in special polypropylene transport tube. These tubes can be obtained from the Parnassus Clinical Laboratory Specimen Receiving Desk (M-521; 415-353-1667) or from the Memory and Aging Center (1500 Owens St., Suite 320; San Francisco, CA 94158; Phone: 415-353-2057). Please request a special polypropylene tube for Beta Amyloid 42/Tau Protein Analysis, CSF. Sample must be accompanied with completed Athena Test Requisition when submitted to the Clinical Laboratory.

**For outpatients download the Neurology PDF form for Commercial Insurance or Self-pay. For inpatients download the Neurology PDF form for Hospitals, Labs and Clinics.**

**Collect:**
- Special polypropylene tube

**Amount to Collect:**
- 2 mL CSF

**Sample Type:**
- CSF

**Preferred Volume:**
- 2 mL CSF

**Minimum Volume:**
- 2 mL CSF

**Unacceptable Conditions:**
- Samples not collected in special polypropylene tube.

**Specimen Preparation:**
- DO NOT TRANSFER SAMPLE TO ANOTHER TUBE! Sample must remain in the special polypropylene tube in which is was collected.

Refrigerate if necessary for a maximum of 24 hours. Transport to CB frozen. Ship to Athena frozen. Use Athena test code #177.
Synonyms:
- AB42
- Alzheimer's

Reported:
2 weeks

CPT Codes:
83520-90 x 3
Beta Globin Gene Deletions
BDEL

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 1x per week as needed, Tuesday or Thursday, day shift only
Methodology:
PCR followed by gel electrophoresis
Reported:
7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This assay will test for the presence or absence of 3 deletions in the beta globin gene. These deletions are predominantly found in Asian Indians, African-Americans and Filipinos. Testing for the 3 deletions in the beta globin gene is recommended when DNA testing for the common point mutations is negative. Thus, this test may serve as a reflex test in the event that the common point mutations test is negative or the presence of a single point mutation is not consistent with the patient's phenotype. A third tier of DNA testing for beta thalassemia is DNA sequencing, which is a separate orderable test and is recommended when the common mutations and deletion assays are negative or incompletely informative.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Beta thalassemia

COLLECTION

Sample Type:
EDTA whole blood, Amniotic fluid, CVS
Collect:
Lavender top preferred. Blue top and Yellow top (ACD) acceptable
Amount to Collect:
Blood: 3 mL
Amniotic fluid: 5 mL
CVS: 10 mg
Preferred Volume:
Blood: 3 mL
Amniotic fluid: 5 mL
CVS: 10 mg
Minimum Volume:
Blood: 0.5 mL
Amniotic fluid: 5 mL
CVS: 10 mg
Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

PROCESSING

Test Code:
BDEL
Test Group:
Thalassemia

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
- Blood: 3 mL
- Amniotic fluid: 5 mL
- CVS: 10 mg

Minimum Volume:
- Blood: 0.5 mL
- Amniotic fluid: 5 mL
- CVS: 10 mg

RESULT INTERPRETATION

Reference Interval:
Negative for deletions

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This assay will test for the presence or absence of 3 deletions in the beta globin gene. These deletions are predominantly found in Asian Indians, African-Americans and Filipinos. Testing for the 3 deletions in the beta globin gene is recommended when DNA testing for the common point mutations is negative. Thus, this test may serve as a reflex test in the event that the common point mutations test is negative or the presence of a single point mutation is not consistent with the patient's phenotype. A third tier of DNA testing for beta thalassemia is DNA sequencing, which is a separate orderable test and is recommended when the common mutations and deletion assays are negative or incompletely informative.

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ADMINISTRATIVE

CPT Codes:
- 81403

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BDEL

Test Group:
- Thalassemia

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed, Tuesday or Thursday, day shift only

Methodology:
- PCR followed by gel electrophoresis

Remarks:
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
- Lavender top preferred. Blue top and Yellow top (ACD) acceptable

Amount to Collect:
Blood: 3 mL  
Amniotic fluid: 5 mL  
CVS: 10 mg

**Sample Type:**  
EDTA whole blood, Amniotic fluid, CVS

**Preferred Volume:**  
Blood: 3 mL  
Amniotic fluid: 5 mL  
CVS: 10 mg

**Minimum Volume:**  
Blood: 0.5 mL  
Amniotic fluid: 5 mL  
CVS: 10 mg

**Specimen Preparation:**  
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Reference Interval:**  
Negative for deletions

**Synonyms:**  
- Beta thalassemia

**Reported:**  
7-10 days

**Additional Information:**  
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This assay will test for the presence or absence of 3 deletions in the beta globin gene. These deletions are predominantly found in Asian Indians, African-Americans and Filipinos. Testing for the 3 deletions in the beta globin gene is recommended when DNA testing for the common point mutations is negative. Thus, this test may serve as a reflex test in the event that the common point mutations test is negative or the presence of a single point mutation is not consistent with the patient's phenotype. A third tier of DNA testing for beta thalassemia is DNA sequencing, which is a separate orderable test and is recommended when the common mutations and deletion assays are negative or incompletely informative.

**Note:** This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**  
81403

**LDT or Modified FDA:**  
Yes
Beta Thalassemia mutations (incl. HbS, HbC, HbE)
BTHL

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 2x per week, Tuesday & Thursday, day shift only
Methodology:
PCR followed by reverse dot blot hybridization with allele-specific probes
Reported:
7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA testing for beta thalassemia mutations is valuable for confirming hematological suspicion of beta-thalassemia (e.g. anemia, low MCV, elevated Hgb A2), for co-existence with iron deficiency and when prenatal diagnosis is contemplated. Iron studies, may also be of value. Include results of these tests with the thalassemia request or indicate if they were ordered at UCSF.

If hemoglobin electrophoresis reveals an elevated Hb A2 and the results of the BTHL test are negative, then further testing by DNA sequencing of the beta globin gene can be performed at an additional charge.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Click here for a list of the tested mutations.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA

Synonyms:
- Cooley's anemia
- Hemoglobin S
- HbS, Hgb S
- Hemoglobin C
- HbC
- Hgb C
- Hemoglobin E
- HbE
- Hgb E

COLLECTION

Sample Type:
EDTA whole blood, Amniocentesis, CVS
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
Blood: 3 mL
Amniotic fluid: 5 mL
CVS: 10 mg
Minimum Volume:
0.5 mL blood

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

PROCESSING

Test Code:
BTHL

Test Group:
Thalassemia

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
Blood: 3 mL
Amniotic fluid: 5 mL
CVS: 10 mg

Minimum Volume:
0.5 mL blood

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA testing for beta thalassemia mutations is valuable for confirming hematological suspicion of beta-thalassemia (e.g. anemia, low MCV, elevated Hgb A2), for co-existence with iron deficiency and when prenatal diagnosis is contemplated. Iron studies, may also be of value. Include results of these tests with the thalassemia request or indicate if they were ordered at UCSF.

If hemoglobin electrophoresis reveals an elevated Hb A2 and the results of the BTHL test are negative, then further testing by DNA sequencing of the beta globin gene can be performed at an additional charge.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Click here for a list of the tested mutations.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA

ADMINISTRATIVE

CPT Codes:
81401, 81479

LDT or Modified FDA:
Yes

LOINC Codes:
21691-1

COMPLETE VIEW

Available Stat:
No

Test Code:
BTHL

Test Group:
Thalassemia

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 2x per week, Tuesday & Thursday, day shift only

Methodology:
PCR followed by reverse dot blot hybridization with allele-specific probes

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood, Amniocentesis, CVS

Preferred Volume:
Blood: 3 mL
Amniotic fluid: 5 mL
CVS: 10 mg

Minimum Volume:
0.5 mL blood

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval:
Negative

Synonyms:
- Cooley’s anemia
- Hemoglobin S
- HbS, Hgb S
- Hemoglobin C
- HbC
- Hgb C
- Hemoglobin E
- HbE
- Hgb E

Reported:
7-10 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA testing for beta thalassemia mutations is valuable for confirming hematological suspicion of beta-thalassemia (e.g. anemia, low MCV, elevated Hgb A2), for co-existence with iron deficiency and when prenatal diagnosis is contemplated. Iron studies, may also be of value. Include results of these tests with the thalassemia request or indicate if they were ordered at UCSF.

If hemoglobin electrophoresis reveals an elevated Hb A2 and the results of the BTHL test are negative, then further testing by DNA sequencing of the beta globin gene can be performed at an additional charge.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Click here for a list of the tested mutations.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA.
CPT Codes:
81401, 81479
LDT or Modified FDA:
Yes
LOINC Codes:
21691-1
Beta-2 Microglobulin, urine
B2MU

**ORDERING**

Available Stat:
No

Performing Lab:
Quest

Methodology:
Fixed rate time nephelometry

Reported:
Set up 6x per week. Turnaround 4-5 days

Additional Information:
Beta-2-microglobulin is unstable in acid urine. Samples should be alkalinized by laboratory staff within 2 hours of collection to prevent inaccurately low results.

Synonyms:
- Beta-microglobulin
- Microglobulin, beta-2

**COLLECTION**

Patient Preparation:
Patient should void bladder, then drink at least 500 mL of water. A urine sample should be collected within 1 hour.

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
10-20 mL

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Remarks:
 Deliver asap to laboratory as Beta-2-microglobulin in unstable in acidic urine.

Results may be inaccurate if the sample is > 2 hours old when received

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20°C 2 months.

Unacceptable Conditions:
Delivered to lab > 30 min after collection

**PROCESSING**

Test Code:
B2MU

Test Group:
Beta-2-Microglobulin

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Adjust urine to pH 6-8 with 1M NaOH. Freeze aliquot. Order Quest # 4150N

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.5 mL urine

**Unacceptable Conditions:**
Delivered to lab > 30 min after collection

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 1 week, frozen at -20C 2 months.

---

**RESULT INTERPRETATION**

**Units:**
µg/g Creatinine (mcg/g Creatinine)

**Reference Interval:**
Normal: <= 132 µg/g creatinine
OSHA Industrial Reference range: 300 µg/g creatinine

**Additional Information:**
Beta-2-microglobulin is unstable in acid urine. Samples should be alkalinized by laboratory staff within 2 hours of collection to prevent inaccurately low results.

---

**ADMINISTRATIVE**

**CPT Codes:**
82232-90, 82570-90

**LOINC Codes:**
13485-8

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**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
B2MU

**Test Group:**
Beta-2-Microglobulin

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Fixed rate time nephelometry

**Patient Preparation:**
Patient should void bladder, then drink at least 500 mL of water. A urine sample should be collected within 1 hour.

**Remarks:**
Deliver asap to laboratory as Beta-2-microglobulin in unstable in acidic urine.

Results may be inaccurate if the sample is > 2 hours old when received

**Collect:**
Urine cup

**Amount to Collect:**
10-20 mL

**Sample Type:**
Random urine

**Preferred Volume:**
1 mL urine

Minimum Volume:

0.5 mL urine

Unacceptable Conditions:

Delivered to lab > 30 min after collection

Specimen Preparation:

Adjust urine to pH 6-8 with 1M NaOH. Freeze aliquot. Order Quest # 4150N

Units:

µg/g Creatinine (mcg/g Creatinine)

Reference Interval:

Normal: <= 132 µg/g creatinine
OSHA Industrial Reference range: 300 µg/g creatinine

Synonyms:

• Beta-microglobulin
• Microglobulin, beta-2

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 1 week, frozen at -20C 2 months.

Reported:

Set up 6x per week. Turnaround 4-5 days

Additional Information:

Beta-2-microglobulin is unstable in acid urine. Samples should be alkalinized by laboratory staff within 2 hours of collection to prevent inaccurately low results.

CPT Codes:

82232-90, 82570-90

LOINC Codes:

13485-8
Beta-2-glycoprotein Antibody, IgA

ORDERING

Available Stat: No
Performing Lab: Quest (Labcorp for B&T patients)
Methodology: EIA
Reported: Run Monday and Wednesday mornings. Results available Tuesday or Thursday afternoon.

Additional Information:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done. These two tests are performed in house.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as antcardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than antcardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis. The clinical significance of IgA Beta-2-glycoprotein antibodies is not definitively established.

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 3 mL blood
Preferred Volume: 2 mL serum (Note this is sufficient to perform IgA, IgG, and IgM antibody testing)
Minimum Volume: 1 mL serum
Stability (from collection to initiation): Frozen 1 month.
Unacceptable Conditions: Gross hemolysis or lipemia
Rejection Criteria: Received thawed. Gross hemolysis or lipemia

PROCESSING

Test Code: B2GA
Test Group: Beta-2-glycoprotein
Sendout: Yes
Performing Lab:
Specimen Preparation:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, order Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM).

Centrifuge red top tube within 60 minutes of collection. Immediately freeze serum at -20C and ship frozen on dry ice. Order Quest test #36552.

For B&T patients order labCorp test # 1639000 and send serum at room temperature.

Preferred Volume:
2 mL serum (Note this is sufficient to perform IgA, IgG, and IgM antibody testing)

Minimum Volume:
1 mL serum

Unacceptable Conditions:
Gross hemolysis or lipemia

Rejection Criteria:
Received thawed. Gross hemolysis or lipemia

Stability (from collection to initiation):
Frozen 1 month.

RESULT INTERPRETATION

Units:
SAU

Reference Interval:
<= 20 SAU

Additional Information:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done. These two tests are performed in house.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis. The clinical significance of IgA Beta-2-glycoprotein antibodies is not definitively established.

ADMINISTRATIVE

CPT Codes:
86146-90

LOINC Codes:
21108-6

COMPLETE VIEW

Available Stat:
No

Test Code:
B2GA

Test Group:
Beta-2-glycoprotein

Performing Lab:
Quest (Labcorp for B&T patients)
Sendout:
Yes

Methodology:
EIA

Collect:
Red top

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum (Note this is sufficient to perform IgA, IgG, and IgM antibody testing)

Minimum Volume:
1 mL serum

Rejection Criteria:
Received thawed. Gross hemolysis or lipemia

Unacceptable Conditions:
Gross hemolysis or lipemia

Specimen Preparation:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, order Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM).

Centrifuge red top tube within 60 minutes of collection. Immediately freeze serum at -20°C and ship frozen on dry ice. Order Quest test #36552.

For B&T patients order labCorp test # 1639000 and send serum at room temperature.

Units:
SAU

Reference Interval:
<= 20 SAU

Stability (from collection to initiation):
Frozen 1 month.

Reported:
Run Monday and Wednesday mornings. Results available Tuesday or Thursday afternoon.

Additional Information:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done. These two tests are performed in house.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis. The clinical significance of IgA Beta-2-glycoprotein antibodies is not definitively established.

CPT Codes:
86146-90

LOINC Codes:
21108-6
Beta-2-glycoprotein Antibody, IgG
B2GPG

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Thursday (day shift)
Methodology:
Chemiluminescent Immunoassay
Reported:
Turn around time 2-8 days
Additional Information:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GG and B2GM) will be done.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticondylipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticondylipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.

COLLECTION

Sample Type:
Serum
Collect:
Gold top preferred, Red top acceptable
Amount to Collect:
3 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Lipemia or gross hemolysis.

PROCESSING

Test Code:
B2GPG
Test Group:
Beta-2-glycoprotein
Performing Lab:
Immunology
Specimen Preparation:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, order both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM).

Freeze serum at -20C.
Preferred Volume:  
1 mL serum

Minimum Volume:  
0.5 mL serum

Unacceptable Conditions:  
Lipemia or gross hemolysis.

RESULT INTERPRETATION

Units:  
CU

Reference Interval:  
<20.1 CU

Additional Information:  
If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GG and B2GM) will be done.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.

ADMINISTRATIVE

CPT Codes:  
86146

COMPLETE VIEW

Available Stat:  
No

Test Code:  
B2GPG

Test Group:  
Beta-2-glycoprotein

Performing Lab:  
Immunology

Performed:  
Thursday (day shift)

Methodology:  
Chemiluminescent Immunoassay

Collect:  
Gold top preferred, Red top acceptable

Amount to Collect:  
3 mL blood

Sample Type:  
Serum

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.5 mL serum

Unacceptable Conditions:  
Lipemia or gross hemolysis.
Lipemia or gross hemolysis.

**Specimen Preparation:**

If Beta-2-Glycoprotein Antibodies are ordered without further specification, order both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM).

Freeze serum at -20C.

**Units:**

CU

**Reference Interval:**

<20.1 CU

**Reported:**

Turn around time 2-8 days

**Additional Information:**

If Beta-2-Glycoprotein Antibodies are ordered without further specification, only Beta-2-Glycoprotein Antibodies IgG and IgM (B2GG and B2GM) will be done.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.

**CPT Codes:**

86146
### Beta-2-glycoprotein Antibody, IgM

<table>
<thead>
<tr>
<th><strong>B2GPM</strong></th>
</tr>
</thead>
</table>

#### ORDERING

<table>
<thead>
<tr>
<th><strong>Available Stat:</strong></th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Immunology</td>
</tr>
<tr>
<td><strong>Performed:</strong></td>
<td>Thursday (day shift)</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>Chemiluminescent Immunoassay</td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
<td>Turn around time 2-8 days</td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
<td>If Beta-2-Glycoprotein Antibodies are ordered without further specification, both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done. Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA. Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>• Beta-2 Glycoprotein Ab, IgM</td>
</tr>
</tbody>
</table>

#### COLLECTION

<table>
<thead>
<tr>
<th><strong>Sample Type:</strong></th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collect:</strong></td>
<td>Gold top preferred, Red top acceptable</td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
<td>3 mL blood</td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>1 mL serum</td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td><strong>Unacceptable Conditions:</strong></td>
<td>Lipemia or gross hemolysis.</td>
</tr>
</tbody>
</table>

#### PROCESSING

<table>
<thead>
<tr>
<th><strong>Test Code:</strong></th>
<th>B2GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Group:</strong></td>
<td>Beta-2-glycoprotein</td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Immunology</td>
</tr>
</tbody>
</table>

If Beta-2-Glycoprotein Antibodies are ordered without further specification, order both Beta-2-Glycoprotein Antibodies IgG and IgM.
Freeze serum at -20°C.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Unacceptable Conditions:**
Lipemia or gross hemolysis.

### RESULT INTERPRETATION

**Units:**
CU

**Reference Interval:**
<20.1 CU

**Additional Information:**
If Beta-2-Glycoprotein Antibodies are ordered without further specification, both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as antiphospholipid antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than antiphospholipid assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.

### ADMINISTRATIVE

**CPT Codes:**
86146

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
B2GPM

**Test Group:**
Beta-2-glycoprotein

**Performing Lab:**
Immunology

**Performed:**
Thursday (day shift)

**Methodology:**
Chemiluminescent Immunoassay

**Collect:**
Gold top preferred, Red top acceptable

**Amount to Collect:**
3 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum
Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Lipemia or gross hemolysis.

Specimen Preparation:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, order both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM).

Freeze serum at -20C.

Units:
CU

Reference Interval:
<20.1 CU

Synonyms:
- Beta-2 Glycoprotein Ab, IgM

Reported:
Turn around time 2-8 days

Additional Information:
If Beta-2-Glycoprotein Antibodies are ordered without further specification, both Beta-2-Glycoprotein Antibodies IgG and IgM (B2GPG and B2GPM) will be done.

Antiphospholipid antibodies (APA) are associated with an increased risk of venous and arterial thrombosis and recurrent fetal loss. These antibodies can be IgG, IgM, or IgA.

Antiphospholipid antibodies require several different tests for detection. Lupus anticoagulants are detected by clotting methods. APA such as anticardiolipin antibody and anti-beta 2 glycoprotein 1 antibodies are detected by immunologic assays. Anti-Beta 2 Glycoprotein Antibodies are a more specific marker for increased risk of thrombosis than anticardiolipin assays. APA associated with thrombotic risk are persistent, and should be confirmed by a repeat positive test after 2-3 months. APA results aid in diagnosis and are helpful in determining the intensity and duration of anticoagulant treatment for patients with Antiphospholipid Syndrome and thrombosis.

CPT Codes:
86146
Beta-2-Microglobulin, serum

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Thursday day shift only
Methodology: Turbidimetry
Reported: 2-8 days
Additional Information: Patients with lymphomas, multiple myeloma, and other medical conditions may have an increased serum concentration of Beta-2-Microglobulin due to increased production.
Synonyms:
- Beta-microglobulin
- Microglobulin, beta-2

COLLECTION

Patient Preparation: An 8 hour fast before specimen collection is preferred.
Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Remarks: Avoid hemolysis.
Unacceptable Conditions: Hemolyzed or lipemic samples

PROCESSING

Test Code: B2MI
Test Group: Beta-2-Microglobulin
Performing Lab: Immunology
Specimen Preparation: Freeze sample at -20°C.
Preferred Volume: 0.5 mL serum
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed or lipemic samples

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:
<2.35 mg/L

Additional Information:
Patients with lymphomas, multiple myeloma, and other medical conditions may have an increased serum concentration of Beta-2-Microglobulin due to increased production.

ADMINISTRATIVE

CPT Codes:
82232

LOINC Codes:
1952-1

COMPLETE VIEW

Available Stat:
No

Test Code:
B2MI

Test Group:
Beta-2-Microglobulin

Performing Lab:
Immunology

Performed:
Thursday day shift only

Methodology:
Turbidimetry

Patient Preparation:
An 8 hour fast before specimen collection is preferred.

Remarks:
Avoid hemolysis.

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed or lipemic samples

Specimen Preparation:
Freeze sample at -20C.
Units:
mg/L

Reference Interval:
<2.35 mg/L

Synonyms:
- Beta-microglobulin
- Microglobulin, beta-2

Reported:
2-8 days

Additional Information:
Patients with lymphomas, multiple myeloma, and other medical conditions may have an increased serum concentration of Beta-2-Microglobulin due to increased production.

CPT Codes:
82232

LOINC Codes:
1952-1
Beta-D-glucan

BDGLU

ORDERING

Approval Required:
Not required for serum samples. Testing on other sample types requires approval of UCSF Adult or Pediatric ID service or Microbiology Director.

Available Stat:
No

Performing Lab:
Viracor

Methodology:
Limulus Amoebocyte Lysate

Reported:
3-4 days

Additional Information:
This assay does not detect certain fungal species such as Cryptococcus (Tanaka et al, 1991) or the yeast phase of Blastomyces (Girouard et al 2007) that produce very low levels of Beta-D-Glucan. The assay also does not detect fungal species that do not produce Beta-D-Glucan such as Absidia, Mucor and Rhizopus (Mitsuya et al 1994).

Due to the potential for contamination by oral Candida Sp. the results from samples collected through the mouth must be evaluated with caution.

Synonyms:
- Beta D glucan

COLLECTION

Sample Type:
Serum, CSF and BAL samples are acceptable for this test

Collect:
Gold top, Red top, CSF tube, Sterile collection tube

Amount to Collect:
3 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
Infants/pediatrics: 0.2 mL serum
Adults: 0.5 mL serum

Stability (from collection to initiation):
Refrigerated 4 days.

Unacceptable Conditions:
Lipemic, icteric or hemolyzed specimens.

Rejection Criteria:
Lipemic, icteric or hemolyzed specimens.

Specimens that have been stored at ambient temperature.

Specimens that have been stored at 2-8°C for >5 days. If storage longer than 5 days is needed, samples should be frozen at -20°C or colder. Unless indicated as stored frozen, the specimen will be rejected if the draw date is >5 days from receipt at ViraCor.

PROCESSING

Test Code:
BDGLU
Sendout: Yes
Performing Lab: Viracor
Preferred Volume: 1 mL serum
Minimum Volume: Infants/pediatrics: 0.2 mL serum
Adults: 0.5 mL serum
Unacceptable Conditions: Lipemic, icteric or hemolyzed specimens.
Rejection Criteria: Lipemic, icteric or hemolyzed specimens.
Specimens that have been stored at ambient temperature.
Specimens that have been stored at 2-8C for >5 days. If storage longer than 5 days is needed, samples should be frozen at -20C or colder. Unless indicated as stored frozen, the specimen will be rejected if the draw date is >5 days from receipt at ViraCor.
Stability (from collection to initiation): Refrigerated 4 days.

RESULT INTERPRETATION

Units: pg/mL
Reference Interval: <60 pg/mL
Additional Information: This assay does not detect certain fungal species such as Cryptococcus (Tanaka et al, 1991) or the yeast phase of Blastomyces (Girouard et al 2007) that produce very low levels of Beta-D-Glucan, The assay also does not detect fungal species that do not produce Beta-D-Glucan such as Absidia, Mucor and Rhizopus (Mitsuya et al 1994).
Due to the potential for contamination by oral Candida Sp. the results from samples collected through the mouth must be evaluated with caution.

ADMINISTRATIVE

CPT Codes: 87449-90
LOINC Codes: 42176-8

COMPLETE VIEW

Approval Required: Not required for serum samples. Testing on other sample types requires approval of UCSF Adult or Pediatric ID service or Microbiology Director.
Available Stat: No
Test Code: BDGLU
Performing Lab: Viracor
Sendout: Yes
Methodology:
Limulus Amoebocyte Lysate

Collect:
   Gold top, Red top, CSF tube, Sterile collection tube

Amount to Collect:
   3 mL blood

Sample Type:
   Serum, CSF and BAL samples are acceptable for this test

Preferred Volume:
   1 mL serum

Minimum Volume:
   Infants/pediatrics: 0.2 mL serum
   Adults: 0.5 mL serum

Rejection Criteria:
   Lipemic, icteric or hemolyzed specimens.

   Specimens that have been stored at ambient temperature.

   Specimens that have been stored at 2-8°C for >5 days. If storage longer than 5 days is needed, samples should be frozen at -20°C or colder. Unless indicated as stored frozen, the specimen will be rejected if the draw date is >5 days from receipt at ViraCor.

Unacceptable Conditions:
   Lipemic, icteric or hemolyzed specimens.

Units:
   pg/mL

Reference Interval:
   <60 pg/mL

Synonyms:
   • Beta D glucan

Stability (from collection to initiation):
   Refrigerated 4 days.

Reported:
   3-4 days

Additional Information:
   This assay does not detect certain fungal species such as Cryptococcus (Tanaka et al, 1991) or the yeast phase of Blastomyces (Girouard et al 2007) that produce very low levels of Beta-D-Glucan. The assay also does not detect fungal species that do not produce Beta-D-Glucan such as Absidia, Mucor and Rhizopus (Mitsuya et al 1994).

   Due to the potential for contamination by oral Candida Sp. the results from samples collected through the mouth must be evaluated with caution.

CPT Codes:
   87449-90

LOINC Codes:
   42176-8
Beta-globin DNA Sequencing
BGSQ

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run 1x per week as needed, Monday or Wednesday, day shift only
Methodology: PCR followed by DNA sequencing
Reported: 7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA sequencing of the beta-globin gene is suggested only when testing with the allele-specific probes for beta thalassemia is negative and when Hb A2 levels are elevated or a variant hemoglobin identified by HPLC testing cannot be confirmed by conventional methods. It is also possible that the presence of iron deficiency may confound the Hb A2 levels, and thus DNA sequencing may be warranted if the beta thalassemia mutations test is negative. SEE NOTES: On Thalassemia Mutations Test.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- PCR

COLLECTION

Sample Type: EDTA whole blood, Amniotic fluid, CVS
Collect: Lavender top
Amount to Collect: 3 mL blood
Preferred Volume:
- Blood: 3 mL
- Amniotic Fluid: 5 mL
- CVS: 10 mg
Minimum Volume: 0.5 mL blood
Remarks:
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

PROCESSING

Test Code: BGSQ
Test Group: Thalassemia
Performing Lab: Medical Genomics - Molecular Diagnostics
**Specimen Preparation:**
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Preferred Volume:**
- Blood: 3 mL
- Amniotic Fluid: 5 mL
- CVS: 10 mg

**Minimum Volume:**
- 0.5 mL blood

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA sequencing of the beta-globin gene is suggested only when testing with the allele-specific probes for beta thalassemia is negative and when Hb A2 levels are elevated or a variant hemoglobin identified by HPLC testing cannot be confirmed by conventional methods. It is also possible that the presence of iron deficiency may confound the Hb A2 levels, and thus DNA sequencing may be warranted if the beta thalassemia mutations test is negative. SEE NOTES: On Thalassemia Mutations Test.

If a mutation is detected it is recommended that the patient seek genetic counseling.

**Note:** This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**ADMINISTRATIVE**

**CPT Codes:**
- 81404

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 21689-5

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BGSQ

**Test Group:**
- Thalassemia

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Performed:**
- Run 1x per week as needed, Monday or Wednesday, day shift only

**Methodology:**
- PCR followed by DNA sequencing

**Remarks:**
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Collect:**
- Lavender top

**Amount to Collect:**
- 3 mL blood

**Sample Type:**
EDTA whole blood, Amniotic fluid, CVS

**Preferred Volume:**
- Blood: 3 mL
- Amniotic Fluid: 5 mL
- CVS: 10 mg

**Minimum Volume:**
- 0.5 mL blood

**Specimen Preparation:**
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Reference Interval:**
Negative

**Synonyms:**
- PCR

**Reported:**
- 7-10 days

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

DNA sequencing of the beta-globin gene is suggested only when testing with the allele-specific probes for beta thalassemia is negative and when Hb A2 levels are elevated or a variant hemoglobin identified by HPLC testing cannot be confirmed by conventional methods. It is also possible that the presence of iron deficiency may confound the Hb A2 levels, and thus DNA sequencing may be warranted if the beta thalassemia mutations test is negative. SEE NOTES: On Thalassemia Mutations Test.

If a mutation is detected it is recommended that the patient seek genetic counseling.

**Note:** This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
- 81404

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 21689-5
Beta-Hydroxybutyrate

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Stanbio enzymatic (D-3-hydroxybutyrate dehydrogenase)
Additional Information:
Beta-hydroxybutyrate (b-OHB) is produced from beta-fatty acid metabolism in patients suffering starvation, acute alcohol use, or in diabetic ketoacidosis. Beta-hydroxybutyrate normally accounts for 50 - 75% of the ketone bodies released into blood, with acetoacetic acid and acetone accounting for the remainder.

During extended fasting or diabetic ketoacidosis, the ratio of beta-hydroxybutyrate to acetoacetic acid is usually around 2 or 3 but can vary between 1 and 6 depending on redox state (Porter et al., Am J Clin Path 1997; 107:353-358).

Under usual circumstances, b-OHB concentrations do not exceed 1 mmol/l in type 1 diabetic subjects. In patients presenting with DKA, the mean b-OHB typically ranges between 4 and 12 mmol/l (Wallace and Matthews,. Q J Med 2004; 97:773-780).

This test may be more specific for diabetic ketoacidosis than the Acetest tablet testing for acetoacetic acid/acetone or the Ketostix dipstick test on urinalysis which primarily reacts with acetoacetic acid. In hyperglycemic patients in the emergency department, urine dipsticks may have similar sensitivity as measurements of b-OHB in blood for detecting diabetic ketoacidosis (DKA) (Arora et al, Diabetes Care 2011, 34:852-4).

Frequent monitoring of serum ketones in uncomplicated DKA may add little additional clinical information over measurements of serum glucose and total carbon dioxide (Porter et al., Am J Clin Path 1997; 107:353-358).

Reference range adapted from studies by the assay manufacturer in healthy adults fasted for 12 hours before blood collection and verified by in house testing of 22 samples from normal volunteers.

Synonyms:
- Ketones

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL
Minimum Volume:
0.5 mL
Stability (from collection to initiation):
Refrigerated 1 week

PROCESSING

Test Code:
BHOB
Test Group:
Ketones

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL

Minimum Volume:
0.5 mL

Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
0.02 - 0.27 mmol/L

Additional Information:
Beta-hydroxybutyrate (b-OHB) is produced from beta-fatty acid metabolism in patients suffering starvation, acute alcohol use, or in diabetic ketoacidosis. Beta-hydroxybutyrate normally accounts for 50 - 75% of the ketone bodies released into blood, with acetoacetic acid and acetone accounting for the remainder.

During extended fasting or diabetic ketoacidosis, the ratio of beta-hydroxybutyrate to acetoacetic acid is usually around 2 or 3 but can vary between 1 and 6 depending on redox state (Porter et al., Am J Clin Path 1997; 107:353-358).

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Frequent monitoring of serum ketones in uncomplicated DKA may add little additional clinical information over measurements of serum glucose and total carbon dioxide (Porter et al., Am J Clin Path 1997; 107:353-358).

Reference range adapted from studies by the assay manufacturer in healthy adults fasted for 12 hours before blood collection and verified by in house testing of 22 samples from normal volunteers.

ADMINISTRATIVE

CPT Codes:
80210

COMPLETE VIEW

Available Stat:
Yes

Test Code:
BHOB

Test Group:
Ketones

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Stanbio enzymatic (D-3-hydroxybutyrate dehydrogenase)

**Collect:**
- Gold top or Light Green top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum or plasma

**Preferred Volume:**
- 1 mL

**Minimum Volume:**
- 0.5 mL

**Units:**
- mmol/L

**Reference Interval:**
- 0.02 - 0.27 mmol/L

**Synonyms:**
- Ketones

**Stability (from collection to initiation):**
- Refrigerated 1 week

**Additional Information:**

Beta-hydroxybutyrate (b-OHB) is produced from beta-fatty acid metabolism in patients suffering starvation, acute alcohol use, or in diabetic ketoacidosis. Beta-hydroxybutyrate normally accounts for 50 - 75% of the ketone bodies released into blood, with acetoacetic acid and acetone accounting for the remainder.

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Under usual circumstances, b-OHB concentrations do not exceed 1 mmol/l in type 1 diabetic subjects. In patients presenting with DKA, the mean b-OHB typically ranges between 4 and 12 mmol/l (Wallace and Matthews, Q J Med 2004; 97:773-780).

This test may be more specific for diabetic ketoacidosis than the Acetest tablet testing for acetoacetic acid/acetone or the Ketostix dipstick test on urinalysis which primarily reacts with acetoacetic acid. In hyperglycemic patients in the emergency department, urine dipsticks may have similar sensitivity as measurements of b-OHB in blood for detecting diabetic ketoacidosis (DKA) (Arora et al, Diabetes Care 2011, 34:852-4).

Frequent monitoring of serum ketones in uncomplicated DKA may add little additional clinical information over measurements of serum glucose and total carbon dioxide (Porter et al., Am J Clin Path 1997; 107:353-358).

Reference range adapted from studies by the assay manufacturer in healthy adults fasted for 12 hours before blood collection and verified by in house testing of 22 samples from normal volunteers.

**CPT Codes:**
- 80210
Bile Acids, Total

ORDERING

Ordering Recommendations:
Use to detect hepatobiliary dysfunction. Do not order to detect inborn errors of bile acid metabolism. May aid in diagnosis of intrahepatic cholestasis of pregnancy.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Enzymatic

Reported:
Within 24 hours

Synonyms:
- Bile Acids, Total
- Bile Salts, Total
- Cholylglycine

COLLECTION

Patient Preparation:
Patient should fast for 8 hours prior to collection.

Collect:
Serum separator tube.

Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 3 months

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:

PROCESSING

Test Code:
BILAT

ARUP Test Code:
0070189

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow specimen to clot completely at room temperature before centrifugation. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:

Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 3 months

Storage/Transport Temperature:
Refrigerated.
RESULT INTERPRETATION

Reference Interval:
0-10 µmol/L

Interpretive Data:
Reference interval applies to fasting specimens.

ADMINISTRATIVE

CPT Codes:
82239

COMPLETE VIEW

Ordering Recommendations:
Use to detect hepatobiliary dysfunction. Do not order to detect inborn errors of bile acid metabolism. May aid in diagnosis of intrahepatic cholestasis of pregnancy.

Test Code:
BILAT

ARUP Test Code:
0070189

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Enzymatic

Patient Preparation:
Patient should fast for 8 hours prior to collection.

Collect:
Serum separator tube.

Unacceptable Conditions:

Specimen Preparation:
Allow specimen to clot completely at room temperature before centrifugation. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Reference Interval:
0-10 µmol/L

Interpretive Data:
Reference interval applies to fasting specimens.

Synonyms:
- Bile Acids, Total
- Bile Salts, Total
- Cholylglycine

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 3 months

Reported:
Within 24 hours
CPT Codes:
82239
Bilirubin, Direct, Plasma / Serum
BILD

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (diazo)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 17.1. Moderate hemolysis may artifactualy decrease the result, whereas severe hemolysis may increase the result.
Synonyms:
- D bili
- Conjugated bilirubin
- DBIL
- Bile

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Remarks:
Protect from light.

PROCESSING

Test Code:
BILD
Test Group:
Bilirubin
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Specimen Preparation:
Protect from light.
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
RESULT INTERPRETATION

Units:
- mg/dL

Reference Interval:
- <1 week: < 0.9 mg/dL
- >= 1 week: < 0.3 mg/dL

Note:
1. Normal range for neonates 0-1 week adopted from Beckman Coulter’s “Pediatric Reference Range Guidelines for Synchron Systems” Bulletin 9345
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range adopted for pediatric patients >1 week.

Additional Information:
- To convert mg/dL to µmol/L (SI units) multiply by 17.1. Moderate hemolysis may artifactualy decrease the result, whereas severe hemolysis may increase the result.

ADMINISTRATIVE

CPT Codes:
- 82248

LOINC Codes:
- 34543-9

COMPLETE VIEW

Available Stat:
- Yes

Test Code:
- BILD

Test Group:
- Bilirubin

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
- Test available 24 hours per day 7 days per week

Methodology:
- Spectrophotometric (diazo)

Remarks:
- Protect from light.

Collect:
- Light green top preferred, Gold top acceptable

Amount to Collect:
- 1 mL blood

Sample Type:
- Plasma or serum

Preferred Volume:
- 0.5 mL plasma or serum

Minimum Volume:
- 0.2 mL plasma or serum

Specimen Preparation:
- Protect from light.

Units:
- mg/dL

Reference Interval:
<1 week: < 0.9 mg/dL
>= 1 week: < 0.3 mg/dL

Note:
1. Normal range for neonates 0-1 week adopted from Beckman Coulter’s “Pediatric Reference Range Guidelines for Synchron Systems” Bulletin 9345
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range adopted for pediatric patients >1 week.

Synonyms:
- D bili
- Conjugated bilirubin
- DBIL
- Bile

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 17.1. Moderate hemolysis may artifically decrease the result, whereas severe hemolysis may increase the result.

CPT Codes:
- 82248

LOINC Codes:
- 34543-9
Bilirubin, Total, Body Fluid
BILTBF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Continuous daily.

Methodology:
Spectrophotometric (diazo)

Reported:
Stat: 1 hour, Routine: 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

To convert mg/dL to µmol/L (SI units) multiply by 17.1.

Hemolysis may artifactually increase the result; lipemia may decrease the result.

Body fluid bilirubin levels are sometimes used to investigate the possibility of bile leaks or bile peritonitis. Although there are no reference ranges available, one recent study suggests that a ratio of the bilirubin concentration in Jackson Pratt drain fluid to the bilirubin concentration in serum of greater than 5.0 is indicative of a bile leak. Darwin, PE, Goldberg, EM, and Uradomo, LT. (2008). Jackson Pratt Drain Fluid to Serum Bilirubin Concentration Ratio for the Diagnosis of Bile Leaks. Gastrointestinal Endoscopy 67(5): AB159.

Ascitic fluid bilirubin levels have also been examined in patients with various forms of ascites. An ascitic fluid bilirubin concentration greater than 6 mg/dL and an ascitic fluid to serum bilirubin ratio of greater than 1.0 appears to be consistent with bile peritonitis. Runyon, BA. (1987). Ascitic fluid bilirubin concentration as a key to choleperitonemum. J Clin Gastroenterol 9(5): 543-545.

COLLECTION

Sample Type:
Body fluid

Collect:
Red top or clean container

Amount to Collect:
5 ml fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Wrap collection tube in foil to protect from light

PROCESSING
Test Code:
BILTBF
Test Group:
Bilirubin
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL fluid
Minimum Volume:
0.2 mL fluid

RESULT INTERPRETATION

Units:
mg/dL

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

To convert mg/dL to µmol/L (SI units) multiply by 17.1.

Hemolysis may artifactually increase the result; lipemia may decrease the result.

Body fluid bilirubin levels are sometimes used to investigate the possibility of bile leaks or bile peritonitis. Although there are no reference ranges available, one recent study suggests that a ratio of the bilirubin concentration in Jackson Pratt drain fluid to the bilirubin concentration in serum of greater than 5.0 is indicative of a bile leak. Darwin, PE, Goldberg, EM, and Uradomo, LT. (2008). Jackson Pratt Drain Fluid to Serum Bilirubin Concentration Ratio for the Diagnosis of Bile Leaks. Gastrointestinal Endoscopy 67(5): AB159.

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ADMINISTRATIVE

CPT Codes:
82247

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
BILTBF
Test Group:
Bilirubin
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Continuous daily.
Methodology:

Spectrophotometric (diazot)

**Remarks:**
- Wrap collection tube in foil to protect from light

**Collect:**
- Red top or clean container

**Amount to Collect:**
- 5 ml fluid

**Sample Type:**
- Body fluid

**Preferred Volume:**
- 1 mL fluid

**Minimum Volume:**
- 0.2 mL fluid

**Units:**
- mg/dL

**Reported:**
- Stat: 1 hour, Routine: 4 hours

**Additional Information:**
- As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

- All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

- To convert mg/dL to µmol/L (SI units) multiply by 17.1.

- Hemolysis may artifactually increase the result; lipemia may decrease the result.

Body fluid bilirubin levels are sometimes used to investigate the possibility of bile leaks or bile peritonitis. Although there are no reference ranges available, one recent study suggests that a ratio of the bilirubin concentration in Jackson Pratt drain fluid to the bilirubin concentration in serum of greater than 5.0 is indicative of a bile leak. Darwin, PE, Goldberg, EM, and Uradomo, LT. (2008). Jackson Pratt Drain Fluid to Serum Bilirubin Concentration Ratio for the Diagnosis of Bile Leaks. Gastrointestinal Endoscopy 67(5): AB159.

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**CPT Codes:**
- 82247
Bilirubin, Total, Plasma / Serum
BILT

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric (diazo)
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 17.1. Hemolysis may artifically increase the result; lipemia may decrease the result.

The clinical laboratory will call physicians for total bilirubin results that exceed the above age-based cutoffs in newborns outside of the intensive care nursery. Only the first critical value will be called in any given patient; subsequent critical values will not be called. These cutoffs were recommended by Dr. Tom Newman in the Department of Pediatrics based in part on the nomogram of Bhutani et al for well newborns (gestational age of 36 weeks or more with birth weight of at least 2000 g, or a gestational age of 35 weeks or more with birth weight of at least 2500 g). Reference: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation, Pediatrics 114:297-316, 2004.

Based on the recommendation of Dr. Yao Sun in the intensive care nursery (ICN), bilirubin results will not be called for infants in the ICN as different cutoffs and monitoring approaches are used in the ICN with sicker/premature infants. The cutoffs take into consideration uncertainty about the exact age of the infant as reported by the hospital computer; the dating of age by the hospital computer system is not entirely accurate and cannot provide patient age in hours.

NOTE: Eltrombopag may cause falsely low bilirubin results using this assay. If a patient is on eltrombopag, the bilirubin sample can be sent for testing to ZSFG as their assay is not affected.

Synonyms:
- T bili
- TBIL
- Conjugated and unconjugated bilirubin
- Bile

COLLECTION

Sample Type: Plasma or serum
Collect: Light green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Remarks: Protect from light.
Test Code: BILT
Test Group: Bilirubin
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Specimen Preparation: Protect from light.
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum

RESULT INTERPRETATION

Units: mg/dL
Reference Interval: 0.2-1.3 mg/dL Normal range was determined by testing 268 male and female healthy adult blood donors at UCSF.
Critical Values:
Only applicable for infants < 30 days old:

<table>
<thead>
<tr>
<th>AGE IN DAYS</th>
<th>CRITICAL VALUE (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&gt; 6</td>
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<tr>
<td>1</td>
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<td>&gt; 18</td>
</tr>
<tr>
<td>5-30</td>
<td>&gt; 21</td>
</tr>
</tbody>
</table>

Note: Criticals are not called to select locations per prior agreement. Repeat critical values within 30 days of an initial critical report will not be called. See ‘Additional Information’

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 17.1. Hemolysis may artifactually increase the result; lipemia may decrease the result.

The clinical laboratory will call physicians for total bilirubin results that exceed the above age-based cutoffs in newborns outside of the intensive care nursery. Only the first critical value will be called in any given patient; subsequent critical values will not be called. These cutoffs were recommended by Dr. Tom Newman in the Department of Pediatrics based in part on the nomogram of Bhutani et al for well newborns (gestational age of 36 weeks or more with birth weight of at least 2000 g, or a gestational age of 35 weeks or more with birth weight of at least 2500 g). Reference: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation, Pediatrics 114:297-316, 2004.

Based on the recommendation of Dr. Yao Sun in the intensive care nursery (ICN), bilirubin results will not be called for infants in the ICN as different cutoffs and monitoring approaches are used in the ICN with sicker/premature infants. The cutoffs take into consideration uncertainty about the exact age of the infant as reported by the hospital computer; the dating of age by the hospital computer system is not entirely accurate and cannot provide patient age in hours.

NOTE: Eltrombopag may cause falsely low bilirubin results using this assay. If a patient is on eltrombopag, the bilirubin sample can be sent for testing to ZSFG as their assay is not affected.

ADMINISTRATIVE

CPT Codes: 82247
LOINC Codes: 34543-9

COMPLETE VIEW
Available Stat:
  Yes
Test Code:
  BILT
Test Group:
  Bilirubin
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Spectrophotometric (diazo)
Remarks:
  Protect from light.
Collect:
  Light green top preferred, Gold top acceptable
Amount to Collect:
  1 mL blood
Sample Type:
  Plasma or serum
Preferred Volume:
  0.5 mL plasma or serum
Minimum Volume:
  0.2 mL plasma or serum
Specimen Preparation:
  Protect from light.
Units:
  mg/dL
Reference Interval:
  0.2-1.3 mg/dL Normal range was determined by testing 268 male and female healthy adult blood donors at UCSF.
Critical Values:
  Only applicable for infants < 30 days old:

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<tr>
<td>5-30</td>
<td>&gt; 21</td>
</tr>
</tbody>
</table>

Note: Criticals are not called to select locations per prior agreement. Repeat critical values within 30 days of an initial critical report will not be called. See 'Additional Information'

Synonyms:
  • T bili
  • TBIL
  • Conjugated and unconjugated bilirubin
  • Bile
Reported:
  STAT 1 hour, Routine 4 hours
Additional Information:
  To convert mg/dL to µmol/L (SI units) multiply by 17.1. Hemolysis may artifactually increase the result; lipemia may decrease the result.

The clinical laboratory will call physicians for total bilirubin results that exceed the above age-based cutoffs in newborns outside of the intensive care nursery. Only the first critical value will be called in any given patient; subsequent critical values will not be called. These
cutoffs were recommended by Dr. Tom Newman in the Department of Pediatrics based in part on the nomogram of Bhutani et al for well newborns (gestational age of 36 weeks or more with birth weight of at least 2000 g, or a gestational age of 35 weeks or more with birth weight of at least 2500 g). Reference: Management of Hyperbilirubinemia in the Newborn Infant 35 or More Weeks of Gestation, Pediatrics 114:297-316, 2004.

Based on the recommendation of Dr. Yao Sun in the intensive care nursery (ICN), bilirubin results will not be called for infants in the ICN as different cutoffs and monitoring approaches are used in the ICN with sicker/premature infants. The cutoffs take into consideration uncertainty about the exact age of the infant as reported by the hospital computer; the dating of age by the hospital computer system is not entirely accurate and cannot provide patient age in hours.

NOTE: Eltrombopag may cause falsely low bilirubin results using this assay. If a patient is on eltrombopag, the bilirubin sample can be sent for testing to ZSFG as their assay is not affected.

CPT Codes:
82247

LOINC Codes:
34543-9
Biopterin (Newborn Screening follow-up only)

ORDERING

Available Stat:  
No

Performing Lab:  
Calif. Dept. of Public Health

COLLECTION

Sample Type:  
Whole blood & urine

Collect:  
Newborn Screening Specimen Collection Card  
Urine container

Amount to Collect:  
4 blood spot circles & 10 mL urine

Preferred Volume:  
4 paper filter blood spots  
10 mL urine

Minimum Volume:  
4 paper filter blood spots  
10 mL urine

Remarks:  
Blood: Fill a minimum of 4 circles on the Newborn Screening Specimen Collection Card and allow to air dry for 3 hours. Keep sample away from direct sunlight and heat. Peel off one barcode label from the Newborn Screening Specimen Collection Card and apply to the Biopterin Specimen Collection form.

Urine: Collect 10 mL urine. Protect collection container from light by wrapping in aluminum foil. Provide pink copy of Biopterin Specimen Collection form to parents. Send the Biopterin Specimen Collection form, Newborn Screening Specimen Collection Card, and urine sample to laboratory for shipment.

Collection Instructions

PROCESSING

Sendout:  
Yes

Performing Lab:  
Calif. Dept. of Public Health

Specimen Preparation:  
Freeze the Newborn Screening Specimen Collection Card in a plastic bag at -20C.

Transfer urine into light protected container. Apply the second bar code label from the Newborn Screening Specimen Collection Card to the urine container. Wrap the urine sample with aluminum foil and freeze at -20C.

Samples can only be shipped Monday-Thursday. Ship urine, Newborn Screening Specimen Collection Card, along with 2 white copies of the Biopterin Specimen Collection form, on dry ice to:

California Department of Public Health Genetic Disease Laboratory Branch  
850 Marina Bay Parkway, C222 for Biopterin  
Richmond, CA 94804

For questions contact Ram Mathur at (510) 231-1790 or (510) 231-1793.

Preferred Volume:  
4 paper filter blood spots
10 mL urine  
**Minimum Volume:**  
- 4 paper filter blood spots  
- 10 mL urine

### COMPLETE VIEW

**Available Stat:**  
No

**Performing Lab:**  
Calif. Dept. of Public Health

**Sendout:**  
Yes

**Remarks:**

**Blood:** Fill a minimum of 4 circles on the Newborn Screening Specimen Collection Card and allow to air dry for 3 hours. keep sample away from direct sunlight and heat. Peel off one barcode label from the Newborn Screening Specimen Collection Card and apply to the Biopterin Specimen Collection form.

**Urine:** Collect 10 mL urine. Protect collection container from light by wrapping in aluminum foil. Provide pink copy of Biopterin Specimen Collection form to parents. Send the Biopterin Specimen Collection form, Newborn Screening Specimen Collection Card, and urine sample to laboratory for shipment.

**Collection Instructions**

**Collect:**
- Newborn Screening Specimen Collection Card  
- Urine container

**Amount to Collect:**
- 4 blood spot circles & 10 mL urine

**Sample Type:**  
Whole blood & urine

**Preferred Volume:**
- 4 paper filter blood spots  
- 10 mL urine

**Minimum Volume:**
- 4 paper filter blood spots  
- 10 mL urine

**Specimen Preparation:**

Freeze the Newborn Screening Specimen Collection Card in a plastic bag at -20C.

Transfer urine into light protected container. Apply the second bar code label from the Newborn Screening Specimen Collection Card to the urine container. Wrap the urine sample with aluminum foil and freeze at -20C.

Samples can only be shipped Monday-Thursday. Ship urine, Newborn Screening Specimen Collection Card, along with 2 white copies of the Biopterin Specimen Collection form, on dry ice to:

California Department of Public Health Genetic Disease Laboratory Branch  
850 Marina Bay Parkway, C222 for Biopterin  
Richmond, CA 94804

For questions contact Ram Mathur at (510) 231-1790 or (510) 231-1793.
Biotinidase
BIOTI

ORDERING

Available Stat:
No
Performing Lab:
   Lucille-Packard Childrens Hospital
Reported:
   Test batched weekly. Turnaround time: 1 week.
Additional Information:
   This quantitative, spectrophotometric assay identifies patients with biotinidase deficiency, or late-onset multiple carboxylase deficiency.

COLLECTION

Sample Type:
   Heparinized plasma or serum
Collect:
   Dark Green top, Gold top
Amount to Collect:
   1 mL blood
Preferred Volume:
   0.5 mL serum or plasma
Minimum Volume:
   0.3 mL serum or plasma

PROCESSING

Test Code:
   BIOTI
Sendout:
   Yes
Performing Lab:
   Lucille-Packard Childrens Hospital
Specimen Preparation:
   Serum/Plasma must be frozen and stored frozen at -20C. Specimen pickup by Stanford Courier Services Monday-Friday. Maintain specimen in frozen condition to Stanford Hospital Clinical Laboratories for testing at Lucille Packard Children's Hospital.
Preferred Volume:
   0.5 mL serum or plasma
Minimum Volume:
   0.3 mL serum or plasma

RESULT INTERPRETATION

Units:
   nmol/min/mL
Reference Interval:
   3.3-8.7 nmol/min/mL
Additional Information:
   This quantitative, spectrophotometric assay identifies patients with biotinidase deficiency, or late-onset multiple carboxylase deficiency.

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
82261-90

LOINC Codes:
32619-9

COMPLETE VIEW

Available Stat:
No

Test Code:
BIOTI

Performing Lab:
Lucille-Packard Childrens Hospital

Sendout:
Yes

Collect:
Dark Green top, Gold top

Amount to Collect:
1 mL blood

Sample Type:
Heparinized plasma or serum

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

Specimen Preparation:
Serum/Plasma must be frozen and stored frozen at -20C. Specimen pickup by Stanford Courier Services Monday-Friday. Maintain specimen in frozen condition to Stanford Hospital Clinical Laboratories for testing at Lucille Packard Children's Hospital.

Units:
nmol/min/mL

Reference Interval:
3.3-8.7 nmol/min/mL

Reported:
Test batched weekly. Turnaround time: 1 week.

Additional Information:
This quantitative, spectrophotometric assay identifies patients with biotinidase deficiency, or late-onset multiple carboxylase deficiency.

CPT Codes:
82261-90

LOINC Codes:
32619-9
BK virus, DNA, Quantitative, plasma
BKV

ORDERING

Available Stat:
No. However, if the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Performing Lab:
Microbiology

Performed:
Test performed 3x per week.

Methodology:
Quantitative Real-Time PCR

Reported:
2-5 days.

Additional Information:
BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting disease, making measurements of BK viral load in urine and plasma useful for clinical monitoring and treatment of kidney transplant and bone marrow transplant recipients.

BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

This assay is capable of accurate quantification from 1000 copies/mL to 1 x 10^10 copies/mL. Samples with DNA detected outside the linear range will be reported as “Detected, 1 x 10^10 copies/mL”.

Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect BKV DNA down to a lower limit of approximately 660 copies/mL.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- BKV
- Polyoma virus

COLLECTION

Sample Type:
EDTA plasma

Collect:
Lavender top (6 mL)

Amount to Collect:
6 mL blood

Preferred Volume:
3 mL EDTA Plasma

Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma

Remarks:
DO NOT draw from heparin containing line.

Stability (from collection to initiation):
Whole blood is stable at room temperature for 1 day. Plasma frozen at -70C 1 month
Unacceptable Conditions:
Heparinized sample, grossly hemolyzed samples, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.

Lipemic samples may interfere with viral quantitation.

PROCESSING

Test Code:
BKV

Test Group:
BK virus

Performing Lab:
Microbiology

Specimen Preparation:
Separate plasma from cells and freeze at -70°C within 6 hours of collection. Transport to China Basin on dry ice.

Preferred Volume:
3 mL EDTA Plasma

Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma

Unacceptable Conditions:
Heparinized sample, grossly hemolyzed samples, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.

Lipemic samples may interfere with viral quantitation.

Stability (from collection to initiation):
Whole blood is stable at room temperature for 1 day. Plasma frozen at -70°C 1 month

RESULT INTERPRETATION

Units:
copies/mL

Reference Interval:
Not detected

Additional Information:
BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting disease, making measurements of BK viral load in urine and plasma useful for clinical monitoring and treatment of kidney transplant and bone marrow transplant recipients.

BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

This assay is capable of accurate quantification from 1000 copies/mL to 1 x 10^10 copies/mL. Samples with DNA detected outside the linear range will be reported as "Detected, 1 x 10^10 copies/mL".

Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect BKV DNA down to a lower limit of approximately 660 copies/mL.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
Available Stat:
No. However, if the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Test Code:
BKV

Test Group:
BK virus

Performing Lab:
Microbiology

Performed:
Test performed 3x per week.

Methodology:
Quantitative Real-Time PCR

Remarks:
DO NOT draw from heparin containing line.

Collect:
Lavender top (6 mL)

Amount to Collect:
6 mL blood

Sample Type:
EDTA plasma

Preferred Volume:
3 mL EDTA Plasma

Minimum Volume:
<3 years old: 0.5 mL plasma
>= 3 years old: 1.5 mL plasma

Unacceptable Conditions:
Heparinized sample, grossly hemolyzed samples, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.

Lipemic samples may interfere with viral quantitation.

Specimen Preparation:
Separate plasma from cells and freeze at -70°C within 6 hours of collection. Transport to China Basin on dry ice.

Units:
copies/mL

Reference Interval:
Not detected

Synonyms:
- BKV
- Polyoma virus

Stability (from collection to initiation):
Whole blood is stable at room temperature for 1 day. Plasma frozen at -70°C 1 month

Reported:
2-5 days.

Additional Information:
BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting

BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

This assay is capable of accurate quantification from 1000 copies/mL to $1 \times 10^{10}$ copies/mL. Samples with DNA detected outside the linear range will be reported as "Detected, $1 \times 10^{10}$ copies/mL".

Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect BKV DNA down to a lower limit of approximately 660 copies/mL.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
- 87799

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 42587-6
BK virus, DNA, Quantitative, urine
BKVU

ORDERING

Available Stat:
No, however, if the patient needs the results rapidly contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Performing Lab:
Microbiology

Performed:
Test performed 3x per week

Methodology:
Quantitative Real-Time PCR

Reported:
2-5 days

Additional Information:
BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting disease, making measurements of BK viral load in urine and plasma useful for clinical monitoring and treatment of kidney transplant and bone marrow transplant recipients.

BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

This assay is capable of accurate quantification from 1000 copies/mL to 1 x 10^10 copies/mL. Samples with DNA detected outside the linear range will be reported as "Detected, 1 x 10^10 copies/mL".

Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect BKV DNA down to a lower limit of 660 copies/mL.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- BKV
- Polyoma virus

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
3 mL urine

Preferred Volume:
3 mL urine

Minimum Volume:
<3 years old: 1 mL urine
>= 3 years old: 2 mL urine

Stability (from collection to initiation):
Room temperature or refrigerated 1 day, frozen at -70°C 1 month

Unacceptable Conditions:
Grossly bloody specimens, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.
Lipemic samples may interfere with viral quantitation.

**PROCESSING**

**Test Code:**
- BKVU

**Test Group:**
- BK virus

**Performing Lab:**
- Microbiology

**Specimen Preparation:**
- Freeze urine at -70°C in screw top tube. Transport to China Basin on dry ice.

**Preferred Volume:**
- 3 mL urine

**Minimum Volume:**
- <3 years old: 1 mL urine
- >= 3 years old: 2 mL urine

**Unacceptable Conditions:**
- Grossly bloody specimens, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.
- Lipemic samples may interfere with viral quantitation.

**Stability (from collection to initiation):**
- Room temperature or refrigerated 1 day, frozen at -70°C 1 month

**RESULT INTERPRETATION**

**Units:**
- copies/mL

**Reference Interval:**
- Not detected

**Additional Information:**
- BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting disease, making measurements of BK viral load in urine and plasma useful for clinical monitoring and treatment of kidney transplant and bone marrow transplant recipients.

- BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

- This assay is capable of accurate quantification from 1000 copies/mL to 1 x 10^10 copies/mL. Samples with DNA detected outside the linear range will be reported as "Detected, 1 x 10^10 copies/mL".

- Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

- The assay can reliably detect BKV DNA down to a lower limit of 660 copies/mL.

- This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

**ADMINISTRATIVE**

**CPT Codes:**
- 87799

**LDT or Modified FDA:**
- Yes
Available Stat:
No, however, if the patient needs the results rapidly contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Test Code:
BKVU

Test Group:
BK virus

Performing Lab:
Microbiology

Performed:
Test performed 3x per week

Methodology:
Quantitative Real-Time PCR

Collect:
Urine cup

Amount to Collect:
3 mL urine

Sample Type:
Random urine

Preferred Volume:
3 mL urine

Minimum Volume:
<3 years old: 1 mL urine
>=3 years old: 2 mL urine

Unacceptable Conditions:
Grossly bloody specimens, repeat sample from a patient within 5 days unless the patient has a prior positive result in which case 2 samples may be submitted within one week.

Lipemic samples may interfere with viral quantitation.

Specimen Preparation:
Freeze urine at -70°C in screw top tube. Transport to China Basin on dry ice.

Units:
copies/mL

Reference Interval:
Not detected

Synonyms:
- BKV
- Polyoma virus

Stability (from collection to initiation):
Room temperature or refrigerated 1 day, frozen at -70°C 1 month

Reported:
2-5 days

Additional Information:
BK virus is linked to the development of polyomavirus-associated nephropathy in kidney transplant recipients and hemorrhagic cystitis in bone marrow transplant recipients. Quantitative viral load thresholds of 10^4 copies/mL for plasma and 10^7 copies/mL for urine have been proposed as indicative of presumptive disease. PCR has been found to have excellent sensitivity and specificity for predicting disease, making measurements of BK viral load in urine and plasma useful for clinical monitoring and treatment of kidney transplant and bone marrow transplant recipients.

BKV copy number is determined by real-time PCR amplification of total plasma or urine DNA using primers to a segment of the VP2 gene on capsid protein of BK virus.

This assay is capable of accurate quantification from 1000 copies/mL to 1 x 10^10 copies/mL. Samples with DNA detected outside the linear range will be reported as "Detected, 1 x 10^10 copies/mL".
Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect BKV DNA down to a lower limit of 660 copies/mL.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
- 87799

**LDT or Modified FDA:**
- Yes
# Blastomycosis Antibody

**BLAS**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Focus via Quest

**Methodology:**
- Immunodiffusion

**Reported:**
- Set up 5x per week. Turnaround time 4-6 days

**Additional Information:**
- Blastomycosis, caused by the fungus Blastomyces dermatitidis, occurs most commonly in men ages 20-69 years. Infection may be transient or lead to chronic, progressive pulmonary disease.

- A positive result is diagnostic of active or recent blastomycosis and is found in approximately 80% of proven cases of blastomycosis.

## COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top (Gold top acceptable)

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 3 days, frozen at -20C 6 months.

## PROCESSING

**Test Code:**
- BLAS

**Sendout:**
- Yes

**Performing Lab:**
- Focus via Quest

**Specimen Preparation:**
- Freeze sample. Order Quest #932. For B&T patients order LabCorp test # 164293

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 3 days, frozen at -20C 6 months.

## RESULT INTERPRETATION

**Reference Interval:**

Printed 06/07/19
Test information subject to change
Blastomycosis, caused by the fungus Blastomyces dermatitidis, occurs most commonly in men ages 20-69 years. Infection may be transient or lead to chronic, progressive pulmonary disease.

A positive result is diagnostic of active or recent blastomycosis and is found in approximately 80% of proven cases of blastomycosis.
**Blood Gas Panel Information**

**ORDERING**

**Available Stat:**
Yes

**Performing Lab:**
Parnassus Chemistry & Mission Bay Blood Gas Lab

**Methodology:**
Radiometer ABL 800
GEM Premier 4000

**Additional Information:**
The following panel of tests are available for Radiometer method:

- **ABGO:** Blood Gas (only) from Arterial source
- **ARTBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Arterial source
- **ABGCOX:** Blood Gas and Cooximetry from Arterial source
- **VBGO:** Blood Gas (only) from Venous source
- **VENBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Venous source
- **VBGCOX:** Blood Gas and Cooximetry from Venous source
- **CORBGA:** Blood gas from Cord Blood gas, Arterial source
- **CORBGV:** Blood gas from Cord Blood gas, Venous source
- **CVBGO:** Blood gas (only) from a Central Venous source
- **CVBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Central Venous source
- **CVBGCX:** Blood Gas and Cooximetry from Central Venous source
- **MVBGO:** Blood gas (only) from a Mixed Venous source
- **MVBG:** Blood Gas, electrolytes, glucose, total hemoglobin and HCT from Mixed Venous source
- **MVBGCX:** Blood Gas, electrolytes, total hemoglobin, HCT from Circuit source
- **CAPBGO:** Bloodgas (only) from Capillary source
- **CAPBG:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT from Capillary source
- **CIRBGA:** Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Arterial source
- **CIRBGV:** Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Venous source
- **CPCOOGX:** Cooximetry from Capillary source

The following panel of tests are available for GEM method:

- **ORBGA:** Blood Gas from Artieral Source
- **ORBGV:** Blood Gas from Venous Source

For ordering purposes this table may help:

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<th>Blood gas</th>
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</table>
Sample Type: Heparinized whole blood

Collect: Plastic blood gas syringe containing 100 U of dry heparin or 70 IU/ml with dry electrolyte-balanced heparin capillary tube.

Preferred Volume: 3 mL whole blood

Minimum Volume: 95 µL

Remarks:

Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterior tibial pulse is assessed and likewise if the posterior tibial approach is used the dorsalis pedis pulse is assessed. The modified Allen's test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

1. Palpate the radial artery and identify the site where the pulse is the strongest. Avoid areas with overlying veins to prevent venous admixture.
2. Prepare the patient's skin with an alcohol or 2% chlorhexidine wipe/swab.
3. Place two or three fingers along the course of the artery both to locate its position and direction, and to stabilize it.
4. Penetrate the skin smoothly holding the needle at 30-60 degree angle with the needle bevel up and pointed proximally. The angle of
the "butterfly" IV catheter should not exceed 45° for pediatric patients.
5. Re-establish the position and direction of the artery by palpation.
6. Gently and slowly advance the needle or “butterfly”, aiming directly for the area of maximum pulsation.
7. When the arterial lumen has been entered, less resistance is felt and blood appears in the syringe above the needle hub.
8. Obtain required amount of arterial blood for test(s).
9. If blood is not obtained on first attempt, withdraw the needle to just below the skin surface and advance needle at same angle but at 1 mm to either side of previous attempt.
10. Place the 2x2 gauze over the site of the puncture then withdraw the needle from the artery. Press firmly at the site for at least five minutes, or until the bleeding stops. Apply bandage or pressure dressing.
11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.

**Venous samples:**
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry (station #151) at Parnassus. Mission Bay Blood Gas Lab (station #21) or hand deliver to Children's Hospital 3rd Floor, Room C3636. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

**Capillary Samples:**
1. The following are recommended sampling sites: earlobe, finger tip, big toe, heel. The heel and big toe are more suitable for use on neonates and infants.
2. Warm the area or puncture site for 5 to 10 minutes prior to actual sampling. This accelerates flow for blood to be representative of general status of patient.
3. Make a puncture using a lancet or similar device. Do not squeeze the area to avoid tissue juice from mixing into blood sample.
4. Wipe off the first drop of blood. Take the sample from the center of the second drop of blood and hold the capillary at a slightly downward angle for an uninterrupted blood flow. Avoid getting air bubbles in the specimen.
5. Refrain from squeezing or milking the puncture site as this may result in faulty measurements or cause hemolysis of blood sample and cause elevated K+ readings.
6. Apply accompanying caps to both ends of the capillary tube and mix the sample with the heparin immediately after collection to prevent blood from clotting. The manufacturer recommends the use of a mixing wire and magnet for capillary samples.
7. Label sample with patient's name, ID and DOB.

Hand deliver all capillary samples to the Blood Gas Lab immediately (within 10 minutes) after collection. Send samples to Parnassus Chemistry 5th floor, Long bldg. Rm L568. MB Blood Gas Lab is in the Children's Hospital, 3rd floor, RM C3636.

**Stability (from collection to initiation):**
- <30 minutes

**Unacceptable Conditions:**
- Received > 30 minutes after collection.

**PROCESSING**

**Test Code:**
See 'Additional Information' for relevant test codes.

**Performing Lab:**
Parnassus Chemistry & Mission Bay Blood Gas Lab

**Preferred Volume:**
3 mL whole blood

**Minimum Volume:**
95 µL

**Unacceptable Conditions:**
- Received > 30 minutes after collection.

**Stability (from collection to initiation):**
- <30 minutes

**RESULT INTERPRETATION**
Critical Values:
See entries for: Blood gases, Whole blood electrolytes, Cooximetry, Lactase and Glucose

Additional Information:
The following panel of tests are available for Radiometer method:

ABGO: Blood Gas (only) from Arterial source
ARTBGL: Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Arterial source
ABGCOX: Blood Gas and Cooximetry from Arterial source
VBGO: Blood Gas (only) from Venous source
VENBGL: Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Venous source
VBGCOX: Blood Gas and Cooximetry from Venous source
CORBGA: Blood gas from Cord Blood gas, Arterial source
CORBGV: Blood gas from Cord Blood gas, Venous source
CVBGO: Blood gas (only) from a Central Venous source
CVBGL: Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Central Venous source
CVBGCOX: Blood Gas and Cooximetry from Central Venous source
MVBGO: Blood gas (only) from a Mixed Venous source
MVBGL: Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Mixed Venous source
MVBGCOX: Blood Gas, electrolytes, total hemoglobin, HCT from Circuit source
CAPBGO: Blood gas (only) from Capillary source
CAPBG: Blood Gas, electrolytes, glucose, total hemoglobin and HCT from Capillary source
CIRBGA: Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Arterial source
CIRBGV: Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Venous source
CPCOOX: Cooximetry from Capillary source

The following panel of tests are available for GEM method:
ORBGA: Blood Gas from Arterial Source
ORBGV: Blood Gas from Venous Source

For ordering purposes this table may help:

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<th>Panel Code</th>
<th>Blood gas</th>
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Available Stat:
Yes
Test Code:
See 'Additional Information' for relevant test codes.

Performing Lab:
Parnassus Chemistry & Mission Bay Blood Gas Lab

Methodology:
Radiometer ABL 800
GEM Premier 4000

Remarks:
Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterior tibial pulse is assessed and likewise if the posterior tibial approach is used the dorsalis pedis pulse is assessed. The modified Allen's test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

1. Palpate the radial artery and identify the site where the pulse is the strongest. Avoid areas with overlying veins to prevent venous admixture.
2. Prepare the patient's skin with an alcohol or 2% chlorhexidine wipe/swab.
3. Place two or three fingers along the course of the artery both to locate its position and direction, and to stabilize it.
4. Penetrate the skin smoothly holding the needle at 30-60 degree angle with the needle bevel up and pointed proximally. The angle of the "butterfly" IV catheter should not exceed 45° for pediatric patients.
5. Re-establish the position and direction of the artery by palpation.
6. Gently and slowly advance the needle or "butterfly", aiming directly for the area of maximum pulsation.
7. When the arterial lumen has been entered, less resistance is felt and blood appears in the syringe above the needle hub.
8. Obtain required amount of arterial blood for test(s).
9. If blood is not obtained on first attempt, withdraw the needle to just below the skin surface and advance needle at same angle but at 1 mm to either side of previous attempt.
10. Place the 2x2 gauze over the site of the puncture then withdraw the needle from the artery. Press firmly at the site for at least five minutes, or until the bleeding stops. Apply bandage or pressure dressing.
11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.

Venous samples:
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry (station #151) at Parnassus. Mission Bay Blood Gas Lab (station #21) or hand deliver to Children's Hospital 3rd Floor, Room C3636. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

Capillary Samples:
1. The following are recommended sampling sites: earlobe, finger tip, big toe, heel. The heel and big toe are more suitable for use on neonates and infants.
2. Warm the area or puncture site for 5 to 10 minutes prior to actual sampling. This accelerates flow for blood to be representative of general status of patient.
3. Make a puncture using a lancet or similar device. Do not squeeze the area to avoid tissue juice from mixing into blood sample.
4. Wipe off the first drop of blood. Take the sample from the center of the second drop of blood and hold the capillary at a slightly downward angle for an uninterrupted blood flow. Avoid getting air bubbles in the specimen.
5. Refrain from squeezing or milking the puncture site as this may result in faulty measurements or cause hemolysis of blood sample and cause elevated K+ readings.
6. Apply accompanying caps to both ends of the capillary tube and mix the sample with the heparin immediately after collection to prevent blood from clotting. The manufacturer recommends the use of a mixing wire and magnet for capillary samples.
7. Label sample with patient's name, ID and DOB.

Hand deliver all capillary samples to the Blood Gas Lab immediately (within 10 minutes) after collection. Send samples to Parnassus Chemistry 5th floor, Long bldg, Rm L568. MB Blood Gas Lab is in the Children's Hospital, 3rd floor, RM C3636.

Collect:
Plastic blood gas syringe containing 100 U of dry heparin or 70 IU/ml with dry electrolyte-balanced heparin capillary tube.

**Sample Type:**
- Heparinized whole blood

**Preferred Volume:**
- 3 mL whole blood

**Minimum Volume:**
- 95 µL

**Unacceptable Conditions:**
- Received > 30 minutes after collection.

**Critical Values:**
- See entries for: Blood gases, Whole blood electrolytes, Cooximetry, Lactase and Glucose

**Synonyms:**
- pH
- pCO₂
- pO₂
- O₂ Saturation
- O₂ Sat
- Base excess
- A-a gradient
- HCO₃⁻
- ABG
- BG
- BE
- oxygen
- carbon dioxide
- bicarbonate
- electrolytes
- glucose
- lactate
- hemoximetry, cooximetry
- hemoglobin
- hematocrit

**Stability (from collection to initiation):**
- <30 minutes

**Additional Information:**

The following panel of tests are available for Radiometer method:

- **ABGO:** Blood Gas (only) from Arterial source
- **ARTBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Arterial source
- **ABGCOX:** Blood Gas and Cooximetry from Arterial source
- **VBGO:** Blood Gas (only) from Venous source
- **VENBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Venous source
- **VBGCOX:** Blood Gas and Cooximetry from Venous source
- **CORBGA:** Blood gas from Cord Blood gas, Arterial source
- **CORBGV:** Blood gas from Cord Blood gas, Venous source
- **CVBGO:** Blood gas (only) from a Central Venous source
- **CVBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Central Venous source
- **CVBGCX:** Blood Gas and Cooximetry from Central Venous source
- **MVBGO:** Blood gas (only) from a Mixed Venous source
- **MVBGL:** Blood Gas, electrolytes, glucose, total hemoglobin, HCT, lactate from Mixed Venous source
- **MVBGCX:** Blood Gas, electrolytes, total hemoglobin, HCT from Circuit source
- **CAPBGO:** Bloodgas (only) from Capillary source
- **CAPBG:** Blood Gas, electrolytes, glucose, total hemoglobin and HCT from Capillary source
CIRBGA: Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Arterial source
CIRBGV: Blood Gas, electrolytes, total hemoglobin, HCT from Circuit Venous source
CPCOOX: Cooximetry from Capillary source

The following panel of tests are available for GEM method:
ORBGA: Blood Gas from Arterial Source
ORBGV: Blood Gas from Venous Source

For ordering purposes this table may help:

<table>
<thead>
<tr>
<th>Panel Code</th>
<th>Blood gas</th>
<th>Electrolytes (Na, K, Cl, iCa)</th>
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Blood Gases
ABGO, VBGO

ORDERING

Available Stat:
Yes

Performing Lab:
- Parnassus Parnassus Chemistry, L568, 353-1755
- Mount Zion MtZ Clinical Laboratory, B212, 885-7845
- Mission Bay Hospital Laboratory, C3636, 514-2146

Performed:
Test available 24 hours per day 7 days per week

Methodology:
- Parnassus and Mission Bay: Radiometer ABL 800
- Mt Zion: Gem Premier 4000

Reported:
10 min

Additional Information:
Blood gas offered at the MtZ are slightly different from the testing at Parnassus and Mission Bay:

Parnassus & Mission Bay Blood gas only:
- ABGO (Arterial Blood Gas only)
- VBGO (Venous Blood Gas only)
- MVBGO (Mixed Venous Blood Gas only)
- CVBGO (Central Venous Blood Gas only)
- CAPBGO (Capillary Blood Gas only)

Mount Zion:
- ORBGA (arterial blood gas)
- ORBGV (venous blood gas)

All reported values are corrected to 37C unless otherwise specified. Results beyond the linear range of the instrument will be reported as < or > the extreme of the linear range. Samples containing small bubbles may be run at the laboratory's discretion. If analyzed, a comment will be added to the result regarding the presence of bubbles in the sample.

Synonyms:
- pH
- pCO2
- pO2
- O2 Saturation
- O2 Sat
- Base excess
- A-a gradient
- HCO3-
- ABG
- BG
- BE
- oxygen
- carbon dioxide
- bicarbonate
- ABGO
- VBGO
- MVBGO
Sample Type:
Heparinized whole blood (Blood gas syringe only)

Collect:
Plastic blood gas syringe containing 100 U of dry heparin

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Remarks:

Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterial tibial pulse is assessed and likewise if the posterial tibial approach is used the dorsalis pedis pulse is assessed. The modified Allen's test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

1. Palpate the radial artery and identify the site where the pulse is the strongest. Avoid areas with overlying veins to prevent venous admixture.
2. Prepare the patient's skin with an alcohol or 2% chlorhexidine wipe/swab.
3. Place two or three fingers along the course of the artery both to locate its position and direction, and to stabilize it.
4. Penetrate the skin smoothly holding the needle at 30-60 degree angle with the needle bevel up and pointed proximally. The angle of the “butterfly” IV catheter should not exceed 45° for pediatric patients.
5. Re-establish the position and direction of the artery by palpation.
6. Gently and slowly advance the needle or “butterfly”, aiming directly for the area of maximum pulsation.
7. When the arterial lumen has been entered, less resistance is felt and blood appears in the syringe above the needle hub.
8. Obtain required amount of arterial blood for test(s).
9. If blood is not obtained on first attempt, withdraw the needle to just below the skin surface and advance needle at same angle but at 1 mm to either side of previous attempt.
10. Place the 2x2 gauze over the site of the puncture then withdraw the needle from the artery. Press firmly at the site for at least five minutes, or until the bleeding stops. Apply bandage or pressure dressing.
11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.

Venous samples:
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry station #151, Mission Bay station #21. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

Stability (from collection to initiation):
30 min.

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.
PROCESSING

Test Code:

Parnassus & Mission Bay:
ABGO (Arterial Blood Gas only)
VBGO (Venous Blood Gas only)
MVBGO (Mixed Venous Blood Gas only)
CVBGO (Central Venous Blood Gas only)
CAPBGO (Capillary Blood Gas only)

Mount Zion:
ORBGA (Arterial blood gas)
ORBGV (Venous blood gas)

Test Group:
Blood Gases

Performing Lab:
Parnassus Parnassus Chemistry, L568, 353-1755
Mount Zion MtZ Clinical Laboratory, B212, 885-7845
Mission Bay Hospital Laboratory, C3636, 514-2146

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

Stability (from collection to initiation):
30 min.

RESULT INTERPRETATION

Units:
mmHg, mmol/L, %

Reference Interval:

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Ages</th>
<th>Arterial</th>
<th>Venous</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>All</td>
<td>7.35-7.45</td>
<td>7.31-7.41</td>
</tr>
<tr>
<td>pCO2</td>
<td>&lt;1 year</td>
<td>27-41 mmHg</td>
<td>41-51 mmHg</td>
</tr>
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<td>pCO2</td>
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<tr>
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</tr>
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<td>35-40 mmHg</td>
</tr>
<tr>
<td>HCO3-</td>
<td>All</td>
<td>22-27 mmol/L</td>
<td></td>
</tr>
<tr>
<td>Base Excess (BE)</td>
<td>All</td>
<td>-2 to 2 mmol/L</td>
<td></td>
</tr>
<tr>
<td>Oxygen saturation (SaO2)</td>
<td>All</td>
<td>95-99%</td>
<td></td>
</tr>
</tbody>
</table>

Critical Values:

Arterial:

pH <7.20 > 7.55
pCO2 <25 mmHg > 65 mmHg
Neonatal pO2 <40 mmHg > 100 mmHg
> 18 year old pO2 <40 mmHg

Venous:

pH <7.20
pCO2 > 75 mm Hg

Cord Blood*:

pH <7.0
Base excess < -10

* Only called to ICN

Additional Information:

Blood gas offered at the MtZ are slightly different from the testing at Parnassus and Mission Bay:

Parnassus & Mission Bay Blood gas only:
ABGO (Arterial Blood Gas only)
VBGO (Venous Blood Gas only)
MVBGO (Mixed Venous Blood Gas only)
CVBGO (Central Venous Blood Gas only)
CAPBGO (Capillary Blood Gas only)

Mount Zion:
ORBGA (arterial blood gas)
ORBGV (venous blood gas)

All reported values are corrected to 37C unless otherwise specified. Results beyond the linear range of the instrument will be reported as < or > the extreme of the linear range. Samples containing small bubbles may be run at the laboratory’s discretion. If analyzed, a comment will be added to the result regarding the presence of bubbles in the sample.

Available Stat:
Yes

Test Code:

Parnassus & Mission Bay:
ABGO (Arterial Blood Gas only)
VBGO (Venous Blood Gas only)
MVBGO (Mixed Venous Blood Gas only)
CVBGO (Central Venous Blood Gas only)
CAPBGO (Capillary Blood Gas only)

Mount Zion:
ORBGA (arterial blood gas)
ORBGV (venous blood gas)

Test Group:
Blood Gases

Performing Lab:

Parnassus Parnassus Chemistry, L568, 353-1755
Mount Zion MtZ Clinical Laboratory, B212, 885-7845
Mission Bay Hospital Laboratory, C3636, 514-2146

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Parnassus and Mission Bay: Radiometer ABL 800
Mt Zion: Gem Premier 4000

Remarks:

Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterial tibial pulse is assessed and likewise if the posterial tibial approach is used the dorsalis pedis pulse is assessed. The modified Allens’s test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

1. Palpate the radial artery and identify the site where the pulse is the strongest. Avoid areas with overlying veins to prevent venous admixture.
2. Prepare the patient's skin with an alcohol or 2% chlorhexidine wipe/swab.
3. Place two or three fingers along the course of the artery both to locate its position and direction, and to stabilize it.
4. Penetrate the skin smoothly holding the needle at 30-60 degree angle with the needle bevel up and pointed proximally. The angle of the “butterfly” IV catheter should not exceed 45° for pediatric patients.
5. Re-establish the position and direction of the artery by palpation.
6. Gently and slowly advance the needle or “butterfly”, aiming directly for the area of maximum pulsation.
7. When the arterial lumen has been entered, less resistance is felt and blood appears in the syringe above the needle hub.
8. Obtain required amount of arterial blood for test(s).
9. If blood is not obtained on first attempt, withdraw the needle to just below the skin surface and advance needle at same angle but at 1 mm to either side of previous attempt.
10. Place the 2x2 gauze over the site of the puncture then withdraw the needle from the artery. Press firmly at the site for at least five minutes, or until the bleeding stops. Apply bandage or pressure dressing.
11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.

**Venous samples:**
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry station #151, Mission Bay station #21. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

**Collect:**
Plastic blood gas syringe containing 100 U of dry heparin

**Amount to Collect:**
3 mL blood

**Sample Type:**
Heparinized whole blood (Blood gas syringe only)

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
1 mL blood

**Unacceptable Conditions:**
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

**Units:**
mmHg, mmol/L, %

**Reference Interval:**

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<td>Oxygen saturation (SaO2)</td>
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<td></td>
</tr>
</tbody>
</table>

**Critical Values:**

**Arterial:**

- pH: <7.20 > 7.55
- pCO2: <25 mmHg > 65 mmHg
- Neonatal pO2: <40 mmHg > 100 mmHg
- > 18 year old pO2: <40 mmHg

**Venous:**

- pH: <7.20
- pCO2: > 75 mm Hg
Cord Blood*:
- pH < 7.0
- Base excess < -10

* Only called to ICN

**Synonyms:**
- pH
- pCO2
- pO2
- O2 Saturation
- O2 Sat
- Base excess
- A-a gradient
- HCO3-
- ABG
- BG
- BE
- oxygen
- carbon dioxide
- bicarbonate
- ABGO
- VBGO
- MVBGO
- CVBGO
- CAPBGO
- ORBGA
- ORBGV

**Stability (from collection to initiation):**
- 30 min.

**Reported:**
- 10 min

**Additional Information:**
Blood gas offered at the MtZ are slightly different from the testing at Parnassus and Mission Bay:

**Parnassus & Mission Bay Blood gas only:**
- ABGO (Arterial Blood Gas only)
- VBGO (Venous Blood Gas only)
- MVBGO (Mixed Venous Blood Gas only)
- CVBGO (Central Venous Blood Gas only)
- CAPBGO (Capillary Blood Gas only)

**Mount Zion:**
- ORBGA (arterial blood gas)
- ORBGV (venous blood gas)

All reported values are corrected to 37C unless otherwise specified. Results beyond the linear range of the instrument will be reported as < or > the extreme of the linear range. Samples containing small bubbles may be run at the laboratory's discretion. If analyzed, a comment will be added to the result regarding the presence of bubbles in the sample.
Blood Smear Morphology

ORDERING

Available Stat:
No, except by Hematology/ Oncology only.

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
24 hours a day

Methodology:
Microscopic examination of Wright-Giemsa stained smear

Additional Information:
Automatically included when Automated Differential is inadequate and a Manual Differential must be done.

WBC abnormalities reported include blasts, immature granulocytes, hyposegmented and hypersegmented neutrophils, toxic granulation, Dohle bodies, inclusions, variant lymphocytes and abnormal lymphocytes.

Platelet abnormalities reported include hypo- and agranular platelets, giant platelets and megakaryocyte nuclear fragments.

Small numbers of RBCs with “abnormal” morphology may be seen in smears from normal individuals. In an effort to simplify and standardize the reporting of smears, the Clinical Laboratories reports the average number of abnormal RBCs seen in at least 10 high power fields (/HPF). The relation of these numbers to qualitative reports is shown below.

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<tr>
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<th>Normal</th>
<th>Rare</th>
<th>Few</th>
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<tr>
<td>Acanthocytes</td>
<td>None</td>
<td>0-1</td>
<td>2-5</td>
<td>&gt;= 6</td>
</tr>
<tr>
<td>Burr cells</td>
<td>0-1</td>
<td>0-1</td>
<td>2-5</td>
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</tr>
<tr>
<td>Drepanocytes (sickle)</td>
<td>None</td>
<td>0-1</td>
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</tr>
<tr>
<td>Elliptocytes</td>
<td>0-1</td>
<td>0-1</td>
<td>2-5</td>
<td>&gt;= 6</td>
</tr>
<tr>
<td>Howell-Jolly bodies</td>
<td>None</td>
<td>0-1</td>
<td>2-5</td>
<td>&gt;= 6</td>
</tr>
<tr>
<td>Polychromatic cells</td>
<td>0-1</td>
<td>0-1</td>
<td>2-5</td>
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</tr>
<tr>
<td>Spherocytes</td>
<td>None</td>
<td>0-1</td>
<td>2-5*</td>
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<tr>
<td>Schistocytes</td>
<td>None</td>
<td>0-1</td>
<td>2-5*</td>
<td>&gt;= 6*</td>
</tr>
<tr>
<td>Basophilic stippled cells</td>
<td>None</td>
<td>0-1</td>
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<tr>
<td>Target cells</td>
<td>0-1</td>
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* Automatically reviewed by a physician

See also CBC w/Differential and Parasites.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:

- Red cell morphology
- Howell-Jolly bodies
- Leukocyte morphology
- WBC morphology
- Schistocyte
- Acanthocyte
- Macrocyte
- Microcyte
- Spherocyte
• Ovalocyte
• Dacrocyte
• Target cell
• Burr cell
• Hypersegmentation
• Hyposegmentation
• Pseudo Pelger-Huet
• Atypical lymphocyte
• Variant lymphocyte
• Blast
• Myeloblast
• Lymphoblast
• NRBC
• Nucleated red cell
• Nucleated red blood cell
• Dohle bodies
• Pappenheimer bodies
• Plasma cell
• Promyelocyte
• Myelocyte
• Metamyelocyte
• band
• Seg
• Segmented neutrophil
• PMN

COLLECTION

Sample Type:
  EDTA whole blood
Collect:
  Lavender top
Amount to Collect:
  1 mL blood
Preferred Volume:
  1 mL blood

PROCESSING

Test Code:
  MORP
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
  1 mL blood

RESULT INTERPRETATION
Reference Interval:
Normal

Critical Values:
Blasts not previously identified

Additional Information:
Automatically included when Automated Differential is inadequate and a Manual Differential must be done.

WBC abnormalities reported include blasts, immature granulocytes, hyposegmented and hypersegmented neutrophils, toxic granulation, Dohle bodies, inclusions, variant lymphocytes and abnormal lymphocytes.

Platelet abnormalities reported include hypo- and agranular platelets, giant platelets and megakaryocyte nuclear fragments.

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</table>

* Automatically reviewed by a physician

See also CBC w/Differential and Parasites.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85008

LOINC Codes:
34994-4

COMPLETE VIEW

Available Stat:
No, except by Hematology/ Oncology only.

Test Code:
MORP

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
24 hours a day

Methodology:
Microscopic examination of Wright-Giemsa stained smear

Collect:
Lavender top
Amount to Collect:
1 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
1 mL blood

Reference Interval:
Normal

Critical Values:
Blasts not previously identified

Synonyms:
- Red cell morphology
- Howell-Jolly bodies
- Leukocyte morphology
- WBC morphology
- Schistocyte
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Additional Information:
Automatically included when Automated Differential is inadequate and a Manual Differential must be done.
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Abnormal RBCs per high power field (/HPF)

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* Automatically reviewed by a physician

See also CBC w/Differential and Parasites.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
85008

**LOINC Codes:**
34994-4
Blood Smear Preparation
SLID

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
24 hours a day
Additional Information:
The purpose of this 'test' is to allow physicians to order a peripheral blood smear to be made for teaching and other non-diagnostic purposes. There is no billing for this service.

This DOES NOT include a review of the smear by either laboratory staff or faculty. If a morphologic review of a patients peripheral smear is desired order "Blood Smear for Morphology" (MORP).

COLLECTION

Sample Type:
EDTA whole blood
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood

PROCESSING

Test Code:
SLID
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
3 mL blood

RESULT INTERPRETATION

Additional Information:
The purpose of this 'test' is to allow physicians to order a peripheral blood smear to be made for teaching and other non-diagnostic purposes. There is no billing for this service.

This DOES NOT include a review of the smear by either laboratory staff or faculty. If a morphologic review of a patients peripheral smear is desired order "Blood Smear for Morphology" (MORP).

COMPLETE VIEW

Available Stat:
No
Test Code:
SLID
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
24 hours a day

Test information subject to change
**Amount to Collect:**
3 mL blood

**Sample Type:**
EDTA whole blood

**Preferred Volume:**
3 mL blood

**Additional Information:**
The purpose of this 'test' is to allow physicians to order a peripheral blood smear to be made for teaching and other non-diagnostic purposes. There is no billing for this service.

This **DOES NOT** include a review of the smear by either laboratory staff or faculty. If a morphologic review of a patient's peripheral smear is desired order "Blood Smear for Morphology" (MORP).
Body Surface Area
BSA

ORDERING

Available Stat:
No

Additional Information:
BSA (m²) = 0.007184 x (Ht in cm)0.725 x (Wt in kg)0.425*

An approximation suitable for most calculators is: BSA (m²) = ([Ht in cm] x [Wt in kg]/3600)0.5**


PROCESSING

Test Code:
BSA

RESULT INTERPRETATION

Additional Information:
BSA (m²) = 0.007184 x (Ht in cm)0.725 x (Wt in kg)0.425*

An approximation suitable for most calculators is: BSA (m²) = ([Ht in cm] x [Wt in kg]/3600)0.5**


COMPLETE VIEW

Available Stat:
No

Test Code:
BSA

Additional Information:
BSA (m²) = 0.007184 x (Ht in cm)0.725 x (Wt in kg)0.425*

An approximation suitable for most calculators is: BSA (m²) = ([Ht in cm] x [Wt in kg]/3600)0.5**

Bone Marrow Collection and Examination

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Parnassus, Mission Bay, Mt. Zion Hematology
Reported:
Slides are available in 3 hours, the final report in 2-7 days.
Additional Information:
For reports, call laboratory medicine resident, x31343 or pager 443-3518.
We recommend that a CBC with Differential and - if anemia is the indication for the marrow examination - a Reticulocyte Count be ordered on the same day as the bone marrow collection.
Order Iron Stains separately, if desired. Additional cytochemical (e.g. myeloperoxidase, non-specific esterase) and histologic stains, including immunohistochemical stains, will be ordered by the pathologist if indicated.
Processing of bone marrow samples for histologic examination during non-routine times: the material, in 10% neutral buffered formalin fixative, will be prepared and stored in Hematology until routinely processed by Histopathology. Questions about Histopathology processing during non-routine times should be directed to the Anatomic Pathology Resident on call.

COLLECTION

Sample Type:
Aspirated bone marrow and/or bone biopsy
Preferred Volume:
1.5-2.0 mL aspirate preferred
Remarks:
Schedule in advance by calling Hematology:
353-1747 for Parnassus inpatients
353-2736 for Parnassus outpatients
476-0194 for Mission Bay
885-7531 for Mt. Zion
Note: Collection assistance is no longer offered at Mission Bay or Mt. Zion.
Be certain to state the location of the bone marrow collection. Please arrange that patient is prepped and anesthetized by the time the technologist arrives.

PROCESSING

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
1.5-2.0 mL aspirate preferred

RESULT INTERPRETATION

Additional Information:
For reports, call laboratory medicine resident, x31343 or pager 443-3518.
We recommend that a CBC with Differential and - if anemia is the indication for the marrow examination - a Reticulocyte Count be
ordered on the same day as the bone marrow collection.

Order Iron Stains separately, if desired. Additional cytochemical (e.g. myeloperoxidase, non-specific esterase) and histologic stains, including immunohistochemical stains, will be ordered by the pathologist if indicated.

Processing of bone marrow samples for histologic examination during non-routine times: the material, in 10% neutral buffered formalin fixative, will be prepared and stored in Hematology until routinely processed by Histopathology. Questions about Histopathology processing during non-routine times should be directed to the Anatomic Pathology Resident on call.

**Available Stat:**
No

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**
Parnassus, Mission Bay, Mt. Zion Hematology

**Remarks:**
Schedule in advance by calling Hematology:

353-1747 for Parnassus inpatients
353-2736 for Parnassus outpatients
476-0194 for Mission Bay
885-7531 for Mt. Zion

Note: Collection assistance is no longer offered at Mission Bay or Mt. Zion.

Be certain to state the location of the bone marrow collection. Please arrange that patient is prepped and anesthetized by the time the technologist arrives.

**Sample Type:**
Aspirated bone marrow and/or bone biopsy

**Preferred Volume:**
1.5-2.0 mL aspirate preferred

**Reported:**
Slides are available in 3 hours, the final report in 2-7 days.

**Additional Information:**
For reports, call laboratory medicine resident, x31343 or pager 443-3518.

We recommend that a CBC with Differential and - if anemia is the indication for the marrow examination - a Reticulocyte Count be ordered on the same day as the bone marrow collection.

Order Iron Stains separately, if desired. Additional cytochemical (e.g. myeloperoxidase, non-specific esterase) and histologic stains, including immunohistochemical stains, will be ordered by the pathologist if indicated.

Processing of bone marrow samples for histologic examination during non-routine times: the material, in 10% neutral buffered formalin fixative, will be prepared and stored in Hematology until routinely processed by Histopathology. Questions about Histopathology processing during non-routine times should be directed to the Anatomic Pathology Resident on call.
Bone Marrow Storage
BMST

ORDERING

Available Stat:
No
Performing Lab:
Blood Bank
Additional Information:
Frozen in liquid N2 for up to 5 years

COLLECTION

Remarks:
By prior arrangement with Blood Bank, x3-1313.

PROCESSING

Test Code:
BMST
Performing Lab:
Blood Bank

RESULT INTERPRETATION

Additional Information:
Frozen in liquid N2 for up to 5 years

COMPLETE VIEW

Available Stat:
No
Test Code:
BMST
Performing Lab:
Blood Bank
Remarks:
By prior arrangement with Blood Bank, x3-1313.
Additional Information:
Frozen in liquid N2 for up to 5 years
Bordetella pertussis Antibody (IgG/IgA)
BPAB

ORDERING

Ordering Recommendations:
Serologic testing for B. pertussis infection includes IgG and IgA antibodies, which are seen in remote and recent infection, respectively. IgM antibodies are less sensitive and are not offered at UCSF. For diagnosis of active infection, PCR is the preferred method.

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Multi-Analyte Immunodetection (MAID)
Reported:
Test performed 5 days a week. Turnaround time: 1-3 days.

Additional Information:
Some adult patients may develop a subacute illness characterized by a prolonged period of coughing-for a month or more-following Bordetella infection. As these patients have often been treated with antibiotics and because organisms often cannot found by PCR or culture in late stages of illness, an elevated antibody titer may be the only way to confirm the suspected diagnosis of adult pertussis. A rise in titer between paired sera, one collected within 1 week of onset of illness and another 2-3 weeks later, is most suggestive of a recent infection, but a single convalescent serum specimen will be accepted. Under some circumstances, sera can be forwarded to CDC for further evaluation.

Serologic testing for B. pertussis infection includes IgG and IgA antibodies, which are seen in remote and recent infection, respectively. IgM antibodies are less sensitive and are not offered at UCSF. For diagnosis of active infection, PCR is the preferred method.

Synonyms:
- Whooping Cough
- Haemophilus pertussis

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

PROCESSING

Test Code:
BPAB
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Allow blood to clot at room temperature and separate serum from cells within 2 hours of collection. Transfer serum to sterile, plastic screw-capped, aliquot tubes and store refrigerated or frozen.
Preferred Volume:
RESULT INTERPRETATION

Units:
IU/mL

Reference Interval:
PT IgG: < 45 IU/mL
PT IgA: < 10 IU/mL
FHA IgG: < 90 IU/mL
FHA IgA: < 50 IU/mL

Additional Information:
Some adult patients may develop a subacute illness characterized by a prolonged period of coughing for a month or more following Bordetella infection. As these patients have often been treated with antibiotics and because organisms cannot be found by PCR or culture in late stages of illness, an elevated antibody titer may be the only way to confirm the suspected diagnosis of adult pertussis. A rise in titer between paired sera, one collected within 1 week of onset of illness and another 2-3 weeks later, is most suggestive of a recent infection, but a single convalescent serum specimen will be accepted. Under some circumstances, sera can be forwarded to CDC for further evaluation.

Serologic testing for B. pertussis infection includes IgG and IgA antibodies, which are seen in remote and recent infection, respectively. IgM antibodies are less sensitive and are not offered at UCSF. For diagnosis of active infection, PCR is the preferred method.

ADMINISTRATIVE

CPT Codes:
86615-90 x4

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Serologic testing for B. pertussis infection includes IgG and IgA antibodies, which are seen in remote and recent infection, respectively. IgM antibodies are less sensitive and are not offered at UCSF. For diagnosis of active infection, PCR is the preferred method.

Test Code:
BPAB

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Multi-Analyte Immunodetection (MAID)

Collect:
Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Allow blood to clot at room temperature and separate serum from cells within 2 hours of collection. Transfer serum to sterile, plastic screw-capped, aliquot tubes and store refrigerated or frozen.
Units:
IU/mL

Reference Interval:
- PT IgG: < 45 IU/mL
- PT IgA: < 10 IU/mL
- FHA IgG: < 90 IU/mL
- FHA IgA: < 50 IU/mL

Synonyms:
- Whooping Cough
- Haemophilus pertussis

Reported:
Test performed 5 days a week. Turnaround time: 1-3 days.

Additional Information:
Some adult patients may develop a subacute illness characterized by a prolonged period of coughing for a month or more following Bordetella infection. As these patients have often been treated with antibiotics and because organisms often cannot be found by PCR or culture in late stages of illness, an elevated antibody titer may be the only way to confirm the suspected diagnosis of adult pertussis. A rise in titer between paired sera, one collected within 1 week of onset of illness and another 2-3 weeks later, is most suggestive of a recent infection, but a single convalescent serum specimen will be accepted. Under some circumstances, sera can be forwarded to CDC for further evaluation.

Serologic testing for B. pertussis infection includes IgG and IgA antibodies, which are seen in remote and recent infection, respectively. IgM antibodies are less sensitive and are not offered at UCSF. For diagnosis of active infection, PCR is the preferred method.

CPT Codes:
86615-90 x4
Botulism Toxin, Adults and Children > 12 months old

P319

ORDERING

Approval Required:
Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830, 24 hours/day, 7 days/wk. The patient's physician will then be contacted by the State Communicable Disease Control Duty Officer of the Day for approval PRIOR to submission of specimens.

Available Stat:
No

Performing Lab:
California State Public Health Reference Laboratory

Performed:
Sent out Monday-Friday, day shift only

Test run Monday-Friday at the State Laboratory.

Reported:
2-4 days typically but may take up to 2 weeks

Additional Information:
Positive results are reported by the Communicable Disease Control Unit to the physician who ordered the test. The patient's physician is required by law to report suspected botulism to the local health department (SF: 554-2800) so that control measures can be formulated.

To learn more about Botulism Click here

Synonyms:
- Botulism immune globulin
- BIG

COLLECTION

Sample Type:
Serum (see Collection instructions)

Collect:
Gold top

Amount to Collect:
30 mL blood

Preferred Volume:
15 mL serum

Remarks:
Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830, 24 hours/day, 7 days/wk. The patient's physician will then be contacted by the State Communicable Disease Control Duty Officer of the Day for approval PRIOR to submission of specimens.

Pre-Antitoxin blood: Collect 30 mL blood (Gold top vacutainers x 6), label with patient name, MR#, time & date of collection and "Pre-antitoxin"

Additional samples: To be collected ONLY when recommended by the public health epidemiologist.

(a) 25 gm feces unpreserved or 25 ml of a sterile water enema. Transport immediately to lab or refrigerate.
(b) 25 ml gastric aspirate, if taken within 72 hours of symptom onset.

Transport immediately to lab or refrigerate. Label all samples with patient name, MR# and date and time of collection. An SFPH laboratory request form must be printed out, completed and sent with a Microbiology requisition and sample to lab. Click here for form

Unacceptable Conditions:
No prior approval from Public health authorities. Inadequate or improperly collected sample(s). Name and/or date of collection not on label
PROCESSING

Test Code: P319
Test Group: Botulism
Sendout: Yes
Performing Lab: California State Public Health Reference Laboratory

Specimen Preparation:
Samples will normally be processed by Microbiology.
If samples are received after Micro hours, processing should spin the blood, aliquot serum and refrigerate. Stool/enema samples should be refrigerated.
Transport all samples at 4-10C (do not allow cold packs to touch samples) to China Basin Microbiology for referral to:
San Francisco Public Health Laboratory, 101 Grove St, Rm 412, SF, CA 94102 (415) 554-2800 for arrival Monday through Friday 8 am through 4 pm.

Preferred Volume:
15 mL serum

Unacceptable Conditions:
No prior approval from Public health authorities. Inadequate or improperly collected sample(s). Name and/or date of collection not on label

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Positive results are reported by the Communicable Disease Control Unit to the physician who ordered the test. The patient's physician is required by law to report suspected botulism to the local health department (SF: 554-2800) so that control measures can be formulated.
To learn more about Botulism Click here

ADMINISTRATIVE

LOINC Codes:
29257-3

COMPLETE VIEW

Approval Required:
Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830, 24 hours/day, 7 days/wk. The patient's physician will then be contacted by the State Communicable Disease Control Duty Officer of the Day for approval PRIOR to submission of specimens.

Available Stat:
No
Test Code: P319
Test Group: Botulism
Performing Lab: California State Public Health Reference Laboratory
Sendout:
Performed:

Sent out Monday-Friday, day shift only

Test run Monday-Friday at the State Laboratory.

Remarks:

Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830, 24 hours/day, 7 days/wk. The patient's physician will then be contacted by the State Communicable Disease Control Duty Officer of the Day for approval PRIOR to submission of specimens.

Pre-Antitoxin blood: Collect 30 mL blood (Gold top vacutainers x 6), label with patient name, MR#, time & date of collection and "Pre-antitoxin"

Additional samples: To be collected ONLY when recommended by the public health epidemiologist.

(a) 25 gm feces unpreserved or 25 ml of a sterile water enema. Transport immediately to lab or refrigerate.
(b) 25 ml gastric aspirate, if taken within 72 hours of symptom onset.

Transport immediately to lab or refrigerate. Label all samples with patient name, MR# and date and time of collection. An SFPH laboratory request form must be printed out, completed and sent with a Microbiology requisition and sample to lab. 

Collect:

Gold top

Amount to Collect:

30 mL blood

Sample Type:

Serum (see Collection instructions)

Preferred Volume:

15 mL serum

Unacceptable Conditions:

No prior approval from Public health authorities. Inadequate or improperly collected sample(s). Name and/or date of collection not on label

Specimen Preparation:

Samples will normally be processed by Microbiology.

If samples are received after Micro hours, processing should spin the blood, aliquot serum and refrigerate. Stool/enema samples should be refrigerated.

Transport all samples at 4-10C (do not allow cold packs to touch samples) to China Basin Microbiology for referral to:

San Francisco Public Health Laboratory, 101 Grove St, Rm 412, SF, CA 94102 (415) 554-2800 for arrival Monday through Friday 8 am through 4 pm.

Reference Interval:

Negative

Synonyms:

- Botulism immune globulin
- BIG

Reported:

2-4 days typically but may take up to 2 weeks

Additional Information:

Positive results are reported by the Communicable Disease Control Unit to the physician who ordered the test. The patient's physician is required by law to report suspected botulism to the local health department (SF: 554-2800) so that control measures can be formulated.

To learn more about Botulism 

LOINC Codes:

29257-3
Botulism Toxin, Children < 12 months old
P319

ORDERING

Approval Required:

Physicians seeking testing for their patients should contact the infant Botulism Treatment and Prevention Program (IBTPP) physician-on-call prior to submission of specimens. Any specimens received without prior authorization will not be tested until such authorization is obtained. Call (510) 231-7600 24 hours/day, 7 days/week.

Available Stat:

No

Performing Lab:

California State Public Health Reference Laboratory

Performed:

Sent out Monday-Friday, day shift only

Reported:

2-4 days typically but may take up to 2 weeks.

Additional Information:

For more information on Infant botulism Click here

Synonyms:

- Botulism immune globulin
- BIG

COLLECTION

Sample Type:

Stool or enema fluid

Collect:

Urine cup (Do not use fixatives or preservatives)

Amount to Collect:

15 mL Stool or enema fluid

Preferred Volume:

15 mL stool or enema fluid

Minimum Volume:

5 mL stool or enema fluid

Remarks:

Physicians seeking testing for their patients should contact the Infant Botulism Treatment and Prevention Program (IBTPP) physician-on-call prior to submission of specimens. Any specimens received without prior authorization will not be tested until such authorization is obtained. Call (510) 231-7600 24 hours/day, 7 days/week.

If passed stool is difficult to obtain due to constipation, an attempt to collect stool in the rectal vault should be made by gentle digital examination by the team member with the smallest fifth finger. If no stool can be obtained digitally, do not wait for a spontaneous bowel movement. Instead, please follow the enema collection procedure outlined below.

Important: Note that glycerin suppositories yield an unsatisfactory specimen and should not be used. The procedure described below will yield the best specimen for diagnostic purposes.

Enema Collection Procedure

1. Attach a 12 to 16 French red rubber (Robinson) catheter to a tapered, catheter-tip syringe.
2. Trim catheter tip to enlarge hole.
3. Lubricate the catheter tip with petroleum jelly or equivalent and insert into distal colon.
4. The volume of sterile, non-bacteriostatic water to use should be a bedside clinical decision based on the patient's body mass.
5. Inject up to 30 ml of sterile, non-bacteriostatic water slowly into distal colon and maintain catheter in rectum. Please note that a minimum volume of 5 ml is required to enable the most accurate diagnostic analysis.
6. Wait approximately 3 minutes, and then draw enema effluent into the syringe.
7. Have an assistant hold a sterile urine container under the anus during this time to collect any expelled material.
8. Expel all fluid collected in the syringe into the same sterile urine container.
9. Tightly seal the lid. Properly label the container with patient's name, date and time of collection.
10. If more than 5 ml of water is retained in the colon, exert gentle pressure onto left lower abdomen (with your hand or with infant's knee to abdomen) to aid in excretion and to minimize intestinal absorption of water.

An SFPH laboratory request form must be printed out, completed and sent with a Microbiology requisition and sample to lab. [Click here for form]

**Unacceptable Conditions:**
- No prior approval from Public health authorities. Inadequate or improperly collected sample(s).

**PROCESSING**

**Test Code:**
- P319

**Test Group:**
- Botulism

**Sendout:**
- Yes

**Performing Lab:**
- California State Public Health Reference Laboratory

**Specimen Preparation:**
- Specimens will be processed by Microbiology. If received after hours refrigerate sample.

- Send the enema specimen to Microbiology along with a completed SFPH Laboratory Request form with an order to keep the sample refrigerated and to expedite shipment to the appropriate botulism diagnostic laboratory.

**Preferred Volume:**
- 15 mL stool or enema fluid

**Minimum Volume:**
- 5 mL stool or enema fluid

**Unacceptable Conditions:**
- No prior approval from Public health authorities. Inadequate or improperly collected sample(s).

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative

**Additional Information:**
- For more information on Infant botulism [Click here]

**ADMINISTRATIVE**

**LOINC Codes:**
- 29257-3

**COMPLETE VIEW**

**Approval Required:**
- Physicians seeking testing for their patients should contact the infant Botulism Treatment and Prevention Program (IBTPP) physician-on-call prior to submission of specimens. Any specimens received without prior authorization will not be tested until such authorization is obtained. Call (510) 231-7600 24 hours/day, 7 days/week.

**Available Stat:**
- No

**Test Code:**
- P319

**Test Group:**
- Botulism

**Performing Lab:**
- California State Public Health Reference Laboratory
California State Public Health Reference Laboratory

**Sendout:**
Yes

**Performed:**
Sent out Monday-Friday, day shift only

**Remarks:**
Physicians seeking testing for their patients should contact the Infant Botulism Treatment and Prevention Program (IBTPP) physician-on-call prior to submission of specimens. Any specimens received without prior authorization will not be tested until such authorization is obtained. Call (510) 231-7600 24 hours/day, 7 days/week.

If passed stool is difficult to obtain due to constipation, an attempt to collect stool in the rectal vault should be made by gentle digital examination by the team member with the smallest fifth finger. If no stool can be obtained digitally, do not wait for a spontaneous bowel movement. Instead, please follow the enema collection procedure outlined below.

**Important:** Note that glycerin suppositories yield an unsatisfactory specimen and should not be used. The procedure described below will yield the best specimen for diagnostic purposes.

**Enema Collection Procedure**
1. Attach a 12 to 16 French red rubber (Robinson) catheter to a tapered, catheter-tip syringe.
2. Trim catheter tip to enlarge hole.
3. Lubricate the catheter tip with petroleum jelly or equivalent and insert into distal colon.
4. The volume of sterile, non-bacteriostatic water to use should be a bedside clinical decision based on the patient's body mass.
5. Inject up to 30 ml of sterile, non-bacteriostatic water slowly into distal colon and maintain catheter in rectum. Please note that a minimum volume of 5 ml is required to enable the most accurate diagnostic analysis.
6. Wait approximately 3 minutes, and then draw enema effluent into the syringe.
7. Have an assistant hold a sterile urine container under the anus during this time to collect any expelled material.
8. Expel all fluid collected in the syringe into the same sterile urine container.
9. Tightly seal the lid. Properly label the container with patient's name, date and time of collection.
10. If more than 5 ml of water is retained in the colon, exert gentle pressure onto left lower abdomen (with your hand or with infant's knee to abdomen) to aid in excretion and to minimize intestinal absorption of water.

An SFPH laboratory request form must be printed out, completed and sent with a Microbiology requisition and sample to lab. [Click here for form]

**Collect:**
Urine cup (Do not use fixatives or preservatives)

**Amount to Collect:**
15 mL Stool or enema fluid

**Sample Type:**
Stool or enema fluid

**Preferred Volume:**
15 mL stool or enema fluid

**Minimum Volume:**
5 mL stool or enema fluid

**Unacceptable Conditions:**
No prior approval from Public health authorities. Inadequate or improperly collected sample(s).

**Specimen Preparation:**
Specimens will be processed by Microbiology. If received after hours refrigerate sample.

Send the enema specimen to Microbiology along with a completed SFPH Laboratory Request form with an order to keep the sample refrigerated and to expedite shipment to the appropriate botulism diagnostic laboratory.

**Reference Interval:**
Negative

**Synonyms:**
- Botulism immune globulin
- BIG

**Reported:**
2-4 days typically but may take up to 2 weeks.

**Additional Information:**
For more information on Infant botulism [Click here]
LOINC Codes:
29257-3
Brazil Nut Component
BCOMP

ORDERING

Performing Lab: Quest
Performed: Tuesday-Saturday
Methodology: Immunoassay
Reported: 1-3 days
Additional Information: This test tests for the rBer e 1 component.
Synonyms:
- Brazil nut Component IgE
- rBer e 1 Ab

COLLECTION

Sample Type: Serum
Collect: Gold or Red-top
Amount to Collect: 1.0 mL blood
Preferred Volume: 0.5 mL blood
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation):
- Room Temperature and Refrigerated: 14 days
- Frozen: 30 days
Storage/Transport Temperature: Frozen

PROCESSING

Test Code: BCOMP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94469.
Preferred Volume: 0.5 mL blood
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation):
- Room Temperature and Refrigerated: 14 days
- Frozen: 30 days
**Storage/Transport Temperature:**
- Frozen

### RESULT INTERPRETATION

- **Units:** kU/L
- **Reference Interval:** <0.10
- **Additional Information:** This test tests for the rBer e 1 component.

### ADMINISTRATIVE

- **CPT Codes:**
  - 86008
- **LOINC Codes:**
  - 64963-2

### COMPLETE VIEW

- **Test Code:** BCOMP
- **Performing Lab:** Quest
- **Sendout:** Yes
- **Performed:** Tuesday-Saturday
- **Methodology:** Immunoassay
- **Collect:** Gold or Red-top
- **Amount to Collect:** 1.0 mL blood
- **Sample Type:** Serum
- **Preferred Volume:** 0.5 mL blood
- **Minimum Volume:** 0.3 mL serum
- **Specimen Preparation:** Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94469.
- **Units:** kU/L
- **Reference Interval:** <0.10
- **Synonyms:**
  - Brazil nut Component IgE
  - rBer e 1 Ab
- **Storage/Transport Temperature:** Frozen
- **Stability (from collection to initiation):** Room Temperature and Refrigerated: 14 days
Frozen: 30 days

Reported:
1-3 days

Additional Information:
This test tests for the rBer e 1 component.

CPT Codes:
86008

LOINC Codes:
64963-2
Brucella antibodies (IgG, IgM)
BRUCI

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Enzyme Immunoassay
Reported:
Set up 2x per week. Turn around 5-7 days.
Additional Information:
Acute brucellosis is characterized by the appearance of Brucella-specific IgM within the first week of infection, followed by the appearance of Brucella-specific IgG after the second week. Levels of both IgM and IgG decline slowly over several months in conjunction with recovery. Persistence of high IgG levels with declining or absent IgM suggests chronic infection or relapse. If acute infection is suspected, Brucella culture and/or antibody testing of another serum specimen (collected 1-2 weeks after this specimen) may be warranted.
Reflex Testing:
If Brucella IgM result is >= 1.10, then Brucella Antibody, Agglutination will be performed at an additional charge

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top acceptable)
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.8 mL serum
Remarks:
Avoid hemolysis.
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 1 month
Rejection Criteria:
Hemolysis, lipemia

PROCESSING

Test Code:
BRUCI
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Allow sample to clot at room temperatur then centrifugue. Refrigerate aliquot. Order Quest # 10566N.
Preferred Volume:
2 mL serum
Minimum Volume:
0.8 mL serum

**Rejection Criteria:**
- Hemolysis, lipemia

**Stability (from collection to initiation):**
- Room temperature 3 days, refrigerated 2 weeks, frozen at -20°C 1 month

**RESULT INTERPRETATION**

**Units:**
- units

**Reference Interval:**
- <0.80 U

**Interpretive criteria:**
- Negative: < 0.80 U
- Equivocal: 0.80-1.09 U
- Positive: >= 1.10 U

**Additional Information:**
Acute brucellosis is characterized by the appearance of Brucella-specific IgM within the first week of infection, followed by the appearance of Brucella-specific IgG after the second week. Levels of both IgM and IgG decline slowly over several months in conjunction with recovery. Persistence of high IgG levels with declining or absent IgM suggests chronic infection or relapse. If acute infection is suspected, Brucella culture and/or antibody testing of another serum specimen (collected 1-2 weeks after this specimen) may be warranted.

**ADMINISTRATIVE**

**CPT Codes:**
- 86622-90 x2

**LOINC Codes:**
- 44458-8

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BRUCI

**Performing Lab:**
- Focus via Quest

**Sendout:**
- Yes

**Methodology:**
- Enzyme Immunoassay

**Remarks:**
- Avoid hemolysis.

**Collect:**
- Red top (Gold top acceptable)

**Amount to Collect:**
- 4 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 0.8 mL serum

**Rejection Criteria:**
Hemolysis, lipemia

**Specimen Preparation:**
Allow sample to clot at room temperature then centrifuge. Refrigerate aliquot. Order Quest # 10566N.

**Units:**
units

**Reference Interval:**
<0.80 U

Interpretive criteria:
- **Negative:** < 0.80 U
- **Equivocal:** 0.80-1.09 U
- **Positive:** >= 1.10 U

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 1 month

**Reported:**
Set up 2x per week. Turn around 5-7 days.

**Reflex Testing:**
If Brucella IgM result is >= 1.10, then Brucella Antibody, Agglutination will be performed at an additional charge

**Additional Information:**
Acute brucellosis is characterized by the appearance of Brucella-specific IgM within the first week of infection, followed by the appearance of Brucella-specific IgG after the second week. Levels of both IgM and IgG decline slowly over several months in conjunction with recovery. Persistence of high IgG levels with declining or absent IgM suggests chronic infection or relapse. If acute infection is suspected, Brucella culture and/or antibody testing of another serum specimen (collected 1-2 weeks after this specimen) may be warranted.

**CPT Codes:**
86622-90 x2

**LOINC Codes:**
44458-8
B-Type Natriuretic Peptide
BNP

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Membrane Immunofluorescence Assay
Reported: STAT 1 hour, Routine 4 hours
Additional Information:

BNP is released from the heart (mainly the left ventricle) in response to increased wall tension and has both diuretic and natriuretic effects. BNP testing appears most useful for helping to rule out congestive heart failure in patients presenting with acute dyspnea. In patients being evaluated for acute dyspnea, BNP levels > 100 pg/mL had a sensitivity of 90% and specificity of 73% in diagnosing congestive heart failure (CHF) (McCullough PA et al Circulation 2002 106(4):416-422). In patients with BNP levels < 50 pg/mL, the negative predictive value for CHF was 96% (Maisel AS N Engl J Med 2002 347(3):161-7).

BNP levels have been shown to correlate with both NYHA functional class and invasively measured hemodynamic parameters. Treatment with ACE inhibitors, diuretics, and nitrates has been shown to decrease BNP levels in parallel with improving clinical symptoms (Richards, AM et al. Trends Endocr. Metabol. 13(4): 151-155. 2002). In patients with acute coronary syndromes, increased BNP levels are associated with increased risk for death during the subsequent 10 months as well with increased risk for myocardial infarction or heart failure (NEJM 345:1014-1021, 2001). Although BNP is renally cleared, acute and chronic renal failure per se do not appear to increase serum BNP significantly.

WARNING: Although normal BNP levels indicate a low probability of CHF, they do not exclude the possibility of heart failure or other serious cardiovascular or pulmonary disorders. Increased BNP levels are also not specific for CHF and can occur in patients with other serious conditions including pulmonary embolism, pulmonary hypertension, or acute myocardial infarction. BNP testing is not a substitute for careful cardiopulmonary evaluation and should not be the sole criterion for determining whether to admit or discharge a patient with dyspnea or other cardiovascular or pulmonary symptoms. BNP testing is also not recommended for screening for LV dysfunction or left ventricular hypertrophy in the general population (JAMA 288:1252-1259, 2002).

Higher levels of BNP are seen in women and older individuals. Age and gender specific reference ranges are listed above (from assay manufacturer, Biosite). Sensitivity and Specificity for Diagnosis of CHF in Patients Presenting to ED with Dyspnea:

<table>
<thead>
<tr>
<th>BNP level (pg/mL)</th>
<th>&gt;50</th>
<th>&gt;80</th>
<th>&gt;100</th>
<th>&gt;125</th>
<th>&gt;150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%)</td>
<td>97</td>
<td>93</td>
<td>90</td>
<td>87</td>
<td>85</td>
</tr>
<tr>
<td>Specificity (%)</td>
<td>82</td>
<td>74</td>
<td>76</td>
<td>79</td>
<td>83</td>
</tr>
<tr>
<td>PPV (%)</td>
<td>71</td>
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</tr>
</tbody>
</table>


Synonyms:
- BNP
- brain type
- ANF
- ANH
- Atrial Natriuretic factor
- Atrial Natriuretic Hormone

COLLECTION

Sample Type: EDTA whole blood
Collect:
Lavender top  
**Amount to Collect:**
1 mL blood  
**Preferred Volume:**
1 mL blood  
**Minimum Volume:**
0.3 mL blood  
**Stability (from collection to initiation):**
Room temperature or refrigerated 7 hours.

### PROCESSING

**Test Code:**
BNP

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Preferred Volume:**
1 mL blood

**Minimum Volume:**
0.3 mL blood

**Stability (from collection to initiation):**
Room temperature or refrigerated 7 hours.

### RESULT INTERPRETATION

**Units:**
pg/mL

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Male (pg/mL)</th>
<th>Female (pg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;45</td>
<td>&lt;25</td>
<td>&lt;48</td>
</tr>
<tr>
<td>45-54</td>
<td>&lt;40</td>
<td>&lt;73</td>
</tr>
<tr>
<td>55-64</td>
<td>&lt;73</td>
<td>&lt;82</td>
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</tr>
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<td>Specificity (%)</td>
<td>62</td>
<td>74</td>
<td>76</td>
<td>79</td>
<td>83</td>
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<td>71</td>
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### ADMINISTRATIVE

**CPT Codes:**
- 83880

**LOINC Codes:**
- 42637-9

### COMPLETE VIEW

**Available Stat:**
- Yes

**Test Code:**
- BNP

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Membrane Immunofluorescence Assay

**Collect:**
- Lavender top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- EDTA whole blood

**Preferred Volume:**
- 1 mL blood

**Minimum Volume:**
- 0.3 mL blood

**Units:**
- pg/mL

**Reference Interval:**

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**Synonyms:**
- BNP
- brain type
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- Atrial Natriuretic factor
- Atrial Natriuretic Hormone

**Stability (from collection to initiation):**
Room temperature or refrigerated 7 hours.

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
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CPT Codes:
83880

LOINC Codes:
42637-9
Bullous pemphigoid Antibodies
BPPAB

ORDERING

Available Stat: No
Performing Lab: Mayo
Methodology: ELISA
Reported: 5-7 days

Additional Information:
Bullous pemphigoid (BP) is chronic pruritic blistering disorder found mainly in aged persons, characterized by the development of tense blisters over an erythematous or urticarial base. IgG antibasement membrane zone antibodies are found in the serum of patients, and linear IgG and C3 sediment is found on the basement membrane zone of the lesion. Several well characterized variants exist including localized, mucous membrane predominant and pemphigoid gestationis, also referred to as herpes gestationis.

Target antigens of the autoantibodies in BP patient serum are BP230 and BP180 also called BPAG1 and BPAG2. Molecular weight of these antigens is 230 kD and 180 kD, respectively. BP180 is thought to be the direct target of the autoantibody because of its location along the basement membranes, and the autoantibody against BP230 is thought to be secondarily produced.

Antibodies to bullous pemphigoid (BP) BP180 and BP230 have been shown to be present in most patients with pemphigoid. Adequate sensitivities and specificity for disease are documented and Mayo's experience demonstrates a very good correlation between BP180 and BP230 results and the presence of pemphigoid (see “Supportive Data”). However, in those patients strongly suspected to have pemphigoid, either by clinical findings or by routine biopsy, and in whom the BP180/BP230 assay is negative, follow-up testing by #8052 “Cutaneous Immunofluorescence Antibodies (IgG), Serum” is recommended.

Antibody titer correlates with disease activity in many patients. Patients with severe disease can usually be expected to have high titers of antibodies to BP. Titers are expected to decrease with clinical improvement.

Synonyms:
- BP180 AB
- BP180 Antibody
- BP230 AB
- BP230 Antibody
- BPAG1 AB
- BPAG1 Antibody
- BPAG2 AB
- BPAG2 Antibody

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks

Unacceptable Conditions:
- Collected in Gold top. Gross hemolysis, lipemia or icterus

Rejection Criteria:
- Gross hemolysis, lipemia or icterus

**PROCESSING**

Test Code:
- BPPAB

Sendout:
- Yes

Performing Lab:
- Mayo

Specimen Preparation:
- Spin and freeze aliquot at -20 C. Ship to China basin.

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Unacceptable Conditions:
- Collected in Gold top. Gross hemolysis, lipemia or icterus

Rejection Criteria:
- Gross hemolysis, lipemia or icterus

Stability (from collection to initiation):
- Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks

**RESULT INTERPRETATION**

Units:
- U

Reference Interval:
- <9.0 U

Additional Information:
Bullous pemphigoid (BP) is chronic pruritic blistering disorder found mainly in aged persons, characterized by the development of tense blisters over an erythematous or urticarial base. IgG antibasement membrane zone antibodies are found in the serum of patients, and linear IgG and C3 sediment is found on the basement membrane zone of the lesion. Several well characterized variants exist including localized, mucous membrane predominant and pemphigoid gestationis, also referred to as herpes gestationis.

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**ADMINISTRATIVE**

CPT Codes:
- 83516-90 x2
Available Stat: No
Test Code: BPPAB
Performing Lab: Mayo
Sendout: Yes
Methodology: ELISA
Collect:
Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Rejection Criteria:
Gross hemolysis, lipemia or icterus
Unacceptable Conditions:
Collected in Gold top. Gross hemolysis, lipemia or icterus
Specimen Preparation:
Spin and freeze aliquot at -20 C. Ship to China basin.
Units:
U
Reference Interval:
<9.0 U
Synonyms:
- BP180 AB
- BP180 Antibody
- BP230 AB
- BP230 Antibody
- BPAG1 AB
- BPAG1 Antibody
- BPAG2 AB
- BPAG2 Antibody
Stability (from collection to initiation):
Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks
Reported:
5-7 days
Additional Information:
Bullous pemphigoid (BP) is chronic pruritic blistering disorder found mainly in aged persons, characterized by the development of tense blisters over an erythematous or urticarial base. IgG antibasement membrane zone antibodies are found in the serum of patients, and linear IgG and C3 sediment is found on the basement membrane zone of the lesion. Several well characterized variants exist including localized, mucous membrane predominant and pemphigoid gestationis, also referred to as herpes gestationis.

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Antibody titer correlates with disease activity in many patients. Patients with severe disease can usually be expected to have high titers of antibodies to BP. Titers are expected to decrease with clinical improvement.

**CPT Codes:**

83516-90 x2
Buprenorphine and Metabolites, Urine, Quantitative

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Buprenorphine, Urine Screen with Reflex to Quantitation (2012273) is preferred.

Performing Lab:
ARUP
Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- Buprenex (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Buprenorphine (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Buprenorphine Glucuronide (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Buprenorphine Screen & Metabolite (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Butrans (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Norbuprenorphine (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Norbuprenorphine Glucuronide (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Norspan (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Pain Management (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
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- Suboxone (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Subutex (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Temgesic (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Transtec (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Veteergesic (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)

COLLECTION

Collect:
Random urine.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years (Avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Room temperature.

PROCESSING

Test Code:
BUPM
ARUP Test Code:
2010092
Sendout:
Performing Lab: ARUP

Specimen Preparation:
Transfer 2 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1 mL)

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years (Avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Room temperature.

RESULT INTERPRETATION

Reference Interval:
Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprenorphine</td>
<td>2 ng/mL</td>
</tr>
<tr>
<td>Norbuprenorphine</td>
<td>2 ng/mL</td>
</tr>
<tr>
<td>Buprenorphine glucuronide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Norbuprenorphine glucuronide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Naloxone</td>
<td>100 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Positive cutoff:
Buprenorphine 2 ng/mL
Norbuprenorphine 2 ng/mL
Buprenorphine glucuronide 5 ng/mL
Norbuprenorphine glucuronide 5 ng/mL
Naloxone 100 ng/mL

For medical purposes only; not valid for forensic use.

The presence of metabolite(s) without parent drug is common and may indicate use of parent drug during the prior week. Naloxone is included to detect the addition of a naloxone-containing drug directly into the urine.

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:
80348 (Alt code: G0480)

COMPLETE VIEW

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Buprenorphine, Urine Screen with Reflex to Quantitation (2012273) is preferred.

Test Code:
BUPM

ARUP Test Code:
2010092

Performing Lab:
ARUP
Sendout: Yes
Performed: Sun-Sat
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Collect: Random urine.
Specimen Preparation: Transfer 2 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1 mL)
Reference Interval: Effective August 17, 2015

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Interpretive Data:
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Positive cutoff:
Buprenorphine 2 ng/mL
Norbuprenorphine 2 ng/mL
Buprenorphine glucuronide 5 ng/mL
Norbuprenorphine glucuronide 5 ng/mL
Naloxone 100 ng/mL

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Synonyms:
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- Buprenorphine (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
- Buprenorphine Glucuronide (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
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• Transtec (Buprenorphine & Metabolites - Confirmation/Quantitation - Urine)
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Storage/Transport Temperature:
Room temperature.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years (Avoid repeated freeze/thaw cycles)

Reported:
1-4 days

CPT Codes:
80348 (Alt code: G0480)
Buprenorphine, Urine Screen with Reflex to Quantitation
BUPUS

ORDERING

Ordering Recommendations:
Useful for general screening in contexts of compliance and/or abuse. A screen with reflex testing is the preferred method for ruling out buprenorphine exposure. For follow-up testing of a presumptive result, Buprenorphine and Metabolites, Urine, Quantitative (2010092) is preferred.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Qualitative Enzyme Immunoassay/Quantitative Liquid Chromatography - Tandem Mass Spectometry

Reported:
1-4 days

Synonyms:
- Buprenex
- Buprenorphine
- Butrans
- Glucuronide
- Norbuprenorphine
- Norbuprenorphine Glucuronide
- Norspan
- Suboxone
- Temgesic
- Vetergesic

COLLECTION

Collect:
Random urine.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

Unacceptable Conditions:
Unknown fluids, pharmaceutical preparations, and breast milk. Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
BUPUS

ARUP Test Code:
2012273

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transfer 4 mL urine with no additives or preservatives to an ARUP Standard Transport Tube (Min: 2 mL)
Unacceptable Conditions:

- Unknown fluids, pharmaceutical preparations, and breast milk. Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):

- Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:

- Room temperature.

RESULT INTERPRETATION

Reference Interval:

- Screen cutoff concentration: 5 ng/mL

Interpretive Data:

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration at which the screening test can detect a drug or metabolite varies. Specimens for which drugs or drug classes are detected by the screen are reflexed to a second, more specific technology (GC/MS and/or LC-MS/MS). The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

For medical purposes only; not valid for forensic use.

ADMINISTRATIVE

CPT Codes:

- 80307; if reflexed, add 80348 (Reflexed Alt Code: G0480)

COMPLETE VIEW

Ordering Recommendations:

Useful for general screening in contexts of compliance and/or abuse. A screen with reflex testing is the preferred method for ruling out buprenorphine exposure. For follow-up testing of a presumptive result, Buprenorphine and Metabolites, Urine, Quantitative (2010092) is preferred.

Test Code:

- BUPUS

ARUP Test Code:

- 2012273

Performing Lab:

- ARUP

Sendout:

- Yes

Performed:

- Sun-Sat

Methodology:

- Qualitative Enzyme Immunoassay/Quantitative Liquid Chromatography - Tandem Mass Spectrometry

Collect:

- Random urine.

Unacceptable Conditions:

- Unknown fluids, pharmaceutical preparations, and breast milk. Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:

- Transfer 4 mL urine with no additives or preservatives to an ARUP Standard Transport Tube (Min: 2 mL)

Reference Interval:

- Screen cutoff concentration: 5 ng/mL

Interpretive Data:

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration at which the screening test can detect a drug or metabolite varies. Specimens for which drugs or drug classes are detected by the screen are...
reflexed to a second, more specific technology (GC/MS and/or LC-MS/MS). The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

For medical purposes only; not valid for forensic use.

**Synonyms:**
- Buprenex
- Buprenorphine
- Butrans
- Glucuronide
- Norbuprenorphine
- Norbuprenorphine Glucuronide
- Norspan
- Suboxone
- Temgesic
- Vetergesic

**Storage/Transport Temperature:**
- Room temperature.

**Stability (from collection to initiation):**
- Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Reported:**
- 1-4 days

**CPT Codes:**
- 80307; if reflexed, add 80348 (Reflexed Alt Code: G0480 )

**Notes:**
- If the specimen screens positive, then Confirmation/Quantitation by LC-MS/MS (ARUP test code 2010092) will be added to confirm result. Additional charges apply.
Burkholderia pseudomallei Antibodies (IgG & IgM)
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Set up 5x per week. Turnaround 5-7 days
Additional Information:
A single IgG titer >= 128 indicates exposure to the organism; a 4-fold increase in titer between acute and convalescent samples confirms infection. Cross-reactivity can occur with Malleomyces mallei (glanders) and some Pseudomonas infections.
Synonyms:
- Meliodosis
- bacterial culture
- Pseudomonas pseudomallei

COLLECTION

Sample Type:
Serum, CSF
Collect:
- Blood: Red top (Gold top acceptable)
- CSF: CSF tube or sterile collection tube
Amount to Collect:
- Blood: 2 mL
- CSF: 1 mL
Preferred Volume:
- Blood: 2 mL
- CSF: 1 mL
Minimum Volume:
0.2 mL serum or CSF
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample. Order Quest # 34985X.
Preferred Volume:
- Blood: 2 mL
- CSF: 1 mL
Minimum Volume:
0.2 mL serum or CSF
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
titer
Reference Interval:
- Negative IgG: < 64 titer
- Negative IgM: < 40 titer

Additional Information:
A single IgG titer >= 128 indicates exposure to the organism; a 4-fold increase in titer between acute and convalescent samples confirms infection. Cross-reactivity can occur with Malleomyces mallei (glanders) and some Pseudomonas infections.

ADMINISTRATIVE

CPT Codes:
86609-90 x2

COMPLETE VIEW

Available Stat:
No
Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Imмуnoassay
Collect:
- Blood: Red top (Gold top acceptable)
- CSF: CSF tube or sterile collection tube
Amount to Collect:
- Blood: 2 mL
- CSF: 1 mL
Sample Type:
- Serum, CSF
Preferred Volume:
- Blood: 2 mL
- CSF: 1 mL
Minimum Volume:
- 0.2 mL serum or CSF
Specimen Preparation:
Refrigerate sample. Order Quest # 34985X.
Units:
titer
Reference Interval:
- Negative IgG: < 64 titer
- Negative IgM: < 40 titer
Synonyms:
- Meliodosis
- bacterial culture
- Pseudomonas pseudomallei
Stability (from collection to initiation):
   Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:
   Set up 5x per week. Turnaround 5-7 days

Additional Information:
   A single IgG titer >= 128 indicates exposure to the organism; a 4-fold increase in titer between acute and convalescent samples confirms infection. Cross-reactivity can occur with Malleomyces mallei (glanders) and some Pseudomonas infections.

CPT Codes:
   86609-90 x2
Busulfan Pharmacokinetics, Adult
BUSUA, BUSAR2

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Run Monday-Friday AM (excluding holidays) with prior notice
Methodology: Liquid chromatography-tandem mass spectrometry (LC-MS/MS)
Reported: Results available next day by 1300 hours
Additional Information: Chemistry China Basin will report the busulfan concentration of each sample and the Area Under the Curve (AUC).

Synonyms:
- Busulfex
- BUSUA, BUSAR2, BUSAR3, BUSAR4, BUSAR5, BUSAR6

COLLECTION

Sample Type: Heparinized plasma
Collect: Dark green top on ice drawn at specific times
Amount to Collect: 2 mL blood for each sample
Preferred Volume: 1 ml heparinized plasma for each sample
Minimum Volume: 1 ml heparinized plasma for each sample
Remarks: Samples should only be collected Sunday through Thursday and the collection MUST be completed and the last sample delivered to the laboratory by 4AM in order to provide results the same day.

Testing should be ordered in APeX.

The first sample should be drawn immediately after termination of the IV infusion, label it with the patient registration label and write the EXACT time of collection on the label. Hand carry the sample to lab on ice. Make sure to notify lab staff that you are delivering a Busulfan sample, DO NOT simply leave it at the desk.

Draw additional samples at the times listed on the busulfan PK sheets after the termination of the infusion. Label each sample with the patient registration labels and write on the label the EXACT time of collection for each sample.

Busulfan is unstable therefore EACH sample must be transported on ice to the laboratory immediately after collection for processing and freezing.

Stability (from collection to initiation):
- Before separation from cells Refrigerated (4C) for 24 hours
- After separation from cells Frozen (-70C) for 2 years

Unacceptable Conditions:
- Sample not received on ice. Not collected in Dark green top tube.
Test Code:
   BUSUA, BUSAR2, BUSAR3, BUSAR4, BUSAR5, BUSAR6

Test Group:
   Busulfan

Performing Lab:
   China Basin Chemistry

Specimen Preparation:
   Samples must be processed immediately upon receipt. When the samples arrive, receive them in Sunquest with the EXACT collection
time as hand-written on the label. Place a Sunquest label on the tube.

   Spin sample down immediately in refrigerated centrifuge, aliquot 1 mL into plastic vial and label with the exact time of collection then
freeze at -70C.

   As additional samples arrive receive them in Sunquest under Order/Receipt Modify. Then process each sample as above. When all
samples have been processed, send them on dry ice to China Basin Chemistry.

   NOTE: The back-up laboratory for this test is the Mayo Clinic. A busulfan information sheet for the Mayo Clinic needs to be completed
for each set of samples: Click here for form

   Using the information entered in Apex for this patient, complete the busulfan information sheet (e.g. the dose, dose number, infusion
start time, infusion stop time and EXACT collection time of each sample). Insert the pager or phone number of the doctor who ordered
the busulfan testing in the results reporting box. Ship the samples on dry ice with the busulfan information sheet to the Mayo Clinic.

Preferred Volume:
   1 ml heparinized plasma for each sample

Minimum Volume:
   1 ml heparinized plasma for each sample

Unacceptable Conditions:
   Sample not received on ice. Not collected in Dark green top tube.

Stability (from collection to initiation):
   Before separation from cells Refrigerated (4C) for 24 hoursAfter separation from cells Frozen (-70C) for 2 years.

RESULT INTERPRETATION

Units:
   Busulfan concentration in each individual sample: ng/mL
   Area under the curve (AUC): μmol*min

Reference Interval:
   Area under the curve therapeutic target:
      Q6hr dosing: 900 - 1500 μmol*min
      Q24hr dosing: 6000 μmol*min

Additional Information:
   Chemistry China Basin will report the busulfan concentration of each sample and the Area Under the Curve (AUC).

   For questions contact China Basin Chemistry at 415-353-4820

ADMINISTRATIVE

CPT Codes:
   80299 x number of samples drawn

LDT or Modified FDA:
   Yes

COMPLETE VIEW

Available Stat:
   No
Test Code: BUSUA, BUSAR2, BUSAR3, BUSAR4, BUSAR5, BUSAR6

Test Group: Busulfan

Performing Lab: China Basin Chemistry

Performed: Run Monday-Friday AM (excluding holidays) with prior notice

Methodology: Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

Remarks: Samples should only be collected Sunday through Thursday and the collection MUST be completed and the last sample delivered to the laboratory by 4AM in order to provide results the same day.

Testing should be ordered in APeX.

The first sample should be drawn immediately after termination of the IV infusion, label it with the patient registration label and write the EXACT time of collection on the label. Hand carry the sample to lab on ice. Make sure to notify lab staff that you are delivering a Busulfan sample, DO NOT simply leave it at the desk.

Draw additional samples at the times listed on the busulfan PK sheets after the termination of the infusion. Label each sample with the patient registration labels and write on the label the EXACT time of collection for each sample.

Busulfan is unstable therefore EACH sample must be transported on ice to the laboratory immediately after collection for processing and freezing.

Collect: Dark green top on ice drawn at specific times

Amount to Collect: 2 mL blood for each sample

Sample Type: Heparinized plasma

Preferred Volume: 1 ml heparinized plasma for each sample

Minimum Volume: 1 ml heparinized plasma for each sample

Unacceptable Conditions: Sample not received on ice. Not collected in Dark green top tube.

Specimen Preparation: Samples must be processed immediately upon receipt. When the samples arrive, receive them in Sunquest with the EXACT collection time as hand-written on the label. Place a Sunquest label on the tube.

Spin sample down immediately in refrigerated centrifuge, aliquot 1 mL into plastic vial and label with the exact time of collection then freeze at -70C.

As additional samples arrive receive them in Sunquest under Order/Receipt Modify. Then process each sample as above. When all samples have been processed, send them on dry ice to China Basin Chemistry.

NOTE: The back-up laboratory for this test is the Mayo Clinic. A busulfan information sheet for the Mayo Clinic needs to be completed for each set of samples: Click here for form

Using the information entered in Apex for this patient, complete the busulfan information sheet (e.g. the dose, dose number, infusion start time, infusion stop time and EXACT collection time of each sample). Insert the pager or phone number of the doctor who ordered the busulfan testing in the results reporting box. Ship the samples on dry ice with the busulfan information sheet to the Mayo Clinic.

Units:
- Busulfan concentration in each individual sample: ng/mL
- Area under the curve (AUC): µmol*min

Reference Interval:
- Area under the curve therapeutic target:
- Q6hr dosing: 900 - 1500 µmol*min
Q24hr dosing: 6000 µmol/min

**Synonyms:**
- Busulfex
- BUSUA, BUSAR2, BUSAR3, BUSAR4, BUSAR5, BUSAR6

**Stability (from collection to initiation):**
- Before separation from cells Refrigerated (4°C) for 24 hours
- After separation from cells Frozen (-70°C) for 2 years.

**Reported:**
- Results available next day by 1300 hours

**Additional Information:**
- Chemistry China Basin will report the busulfan concentration of each sample and the Area Under the Curve (AUC).

For questions contact China Basin Chemistry at 415-353-4820

**CPT Codes:**
- 80299 x number of samples drawn

**LDT or Modified FDA:**
- Yes
**Busulfan Pharmacokinetics, Pediatric (Non-Research)**

**BUSRP1, BUSRP2, BUSRP3, BUSRP4, BUSRP5, BUSRP6, BU**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Run Monday-Friday AM with prior notice (excluding holidays)

**Methodology:**
- Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

**Reported:**
- Results available same day by 1300 hours

**Additional Information:**
- Chemistry China Basin will report the busulfan concentration of each sample.

  For questions contact China Basin Chemistry at 415 353 4820

**Synonyms:**
- Busulfex

### COLLECTION

**Sample Type:**
- Heparinized plasma

**Collect:**
- Dark green top on ice drawn at specific times

**Amount to Collect:**
- 2 mL blood for each sample

**Preferred Volume:**
- 1 ml heparinized plasma for each sample

**Minimum Volume:**
- 1 ml heparinized plasma for each sample

**Remarks:**
- Samples should only be collected Sunday through Friday and the collection MUST be completed and the last sample delivered to the laboratory by 5:00AM in order to provide results the same day.

  Testing should be ordered in APeX.

  For PK studies on the first busulfan dose, the first sample should be drawn immediately after termination of the IV infusion. For PK studies on the steady state busulfan doses, the first sample should be drawn immediately before the start of the IV infusion. The remaining samples should be drawn at the times listed on the busulfan PK sheets (use correct PK sheet for each study: e.g. Q6hr, Q12hr or Q24hr).

  Each patient sample should have a label affixed to it, and the EXACT time of collection should be written on the label or the APeX requisition and on the busulfan PK sheet. Hand-carry the sample to lab on ice with the requisition. Make sure to notify lab staff that you are delivering a busulfan sample, DO NOT simply leave it at the desk. Busulfan is unstable therefore EACH sample must be transported on ice to the laboratory immediately after collection for processing and freezing. With the final sample, bring the busulfan PK sheet with the correct collect times completed for each sample to the lab.

**Stability (from collection to initiation):**
- Before separation from cells Refrigerated (4C) for 24 hours
- After separation from cells Frozen (-70C) for 2 years

**Unacceptable Conditions:**
- Sample not received on ice. Not collected in Dark green top tube.

### PROCESSING
Test Code:
BUSRP1, BUSRP2, BUSRP3, BUSRP4, BUSRP5, BUSRP6, BUSRP7

Test Group:
Busulfan

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Samples must be processed immediately upon receipt. When the samples arrive, receive them in Sunquest with the EXACT collection time as hand-written on the label or Apex requisition. Place a Sunquest label on the tube. Spin sample down immediately in refrigerated centrifuge, aliquot 1 mL into plastic vial and label with the exact time of collection then freeze at -70C.

As additional samples arrive receive them in Sunquest under Order/Receipt Modify. Then process each sample as above. When all samples have been processed, send them on dry ice to China Basin Chemistry.

NOTE: The back-up laboratory for this test is at the University of Pennsylvania Toxicology Laboratory. A busulfan information sheet for the University of Pennsylvania needs to be completed for each set of samples: Click here for UPenn form

Make a copy of the busulfan PK sheet (e.g. containing the dose, dose number, infusion start time, infusion stop time and EXACT collection time of each sample). Insert the name and the pager or phone number of the doctor who ordered the busulfan testing in the results reporting box. Call the University of Pennsylvania Toxicology Laboratory at 1-215-662-3474 to let them know that we will be sending them busulfan samples. Ship the samples on dry ice with the busulfan information sheet to the University of Pennsylvania Toxicology Laboratory.

Preferred Volume:
1 ml heparinized plasma for each sample

Minimum Volume:
1 ml heparinized plasma for each sample

Unacceptable Conditions:
Sample not received on ice. Not collected in Dark green top tube.

Stability (from collection to initiation):
Before separation from cells Refrigerated (4C) for 24 hours After separation from cells Frozen (-70C) for 2 years.

RESULT INTERPRETATION

Units:
ng/mL

Additional Information:
Chemistry China Basin will report the busulfan concentration of each sample.

For questions contact China Basin Chemistry at 415 353 4820

ADMINISTRATIVE

CPT Codes:
80299 x number of samples tested

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
BUSRP1, BUSRP2, BUSRP3, BUSRP4, BUSRP5, BUSRP6, BUSRP7

Test Group:
Busulfan

Performing Lab:
China Basin Chemistry

Performed:
Run Monday-Friday AM with prior notice (excluding holidays)

Methodology:
Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

Remarks:
Samples should only be collected Sunday through Friday and the collection MUST be completed and the last sample delivered to the laboratory by 5:00AM in order to provide results the same day.

Testing should be ordered in APeX.

For PK studies on the first busulfan dose, the first sample should be drawn immediately after termination of the IV infusion. For PK studies on the steady state busulfan doses, the first sample should be drawn immediately before the start of the IV infusion. The remaining samples should be drawn at the times listed on the busulfan PK sheets (use correct PK sheet for each study: e.g. Q6hr, Q12hr or Q24hr).

Each patient sample should have a label affixed to it, and the EXACT time of collection should be written on the label or the APeX requisition and on the busulfan PK sheet. Hand-carry the sample to lab on ice with the requisition. Make sure to notify lab staff that you are delivering a busulfan sample, DO NOT simply leave it at the desk. Busulfan is unstable therefore EACH sample must be transported on ice to the laboratory immediately after collection for processing and freezing. With the final sample, bring the busulfan PK sheet with the correct collect times completed for each sample to the lab.

Collect:
Dark green top on ice drawn at specific times

Amount to Collect:
2 mL blood for each sample

Sample Type:
Heparinized plasma

Preferred Volume:
1 ml heparinized plasma for each sample

Minimum Volume:
1 ml heparinized plasma for each sample

Unacceptable Conditions:
Sample not received on ice. Not collected in Dark green top tube.

Specimen Preparation:
Samples must be processed immediately upon receipt. When the samples arrive, receive them in Sunquest with the EXACT collection time as hand-written on the label or APeX requisition. Place a Sunquest label on the tube. Spin sample down immediately in refrigerated centrifuge, aliquot 1 mL into plastic vial and label with the exact time of collection then freeze at -70C.

As additional samples arrive receive them in Sunquest under Order/Receipt Modify. Then process each sample as above. When all samples have been processed, send them on dry ice to China Basin Chemistry.

NOTE:The back-up laboratory for this test is at the University of Pennsylvania Toxicology Laboratory. A busulfan information sheet for the University of Pennsylvania needs to be completed for each set of samples: Click here for UPenn form

Make a copy of the busulfan PK sheet (e.g. containing the dose, dose number, infusion start time, infusion stop time and EXACT collection time of each sample). Insert the name and the pager or phone number of the doctor who ordered the busulfan testing in the results reporting box. Call the University of Pennsylvania Toxicology Laboratory at 1-215-662-3474 to let them know that we will be sending them busulfan samples. Ship the samples on dry ice with the busulfan information sheet to the University of Pennsylvania Toxicology Laboratory.

Units:
ng/mL

Synonyms:
• Busulfex

Stability (from collection to initiation):
Before separation from cells Refrigerated (4C) for 24 hours After separation from cells Frozen (-70C) for 2 years.

Reported:
Results available same day by 1300 hours

Additional Information:
Chemistry China Basin will report the busulfan concentration of each sample.
For questions contact China Basin Chemistry at 415 353 4820

CPT Codes:
  80299 x number of samples tested

LDT or Modified FDA:
  Yes
C1 Esterase Inhibitor Deficiency Panel
C1EI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Reported:
Test performed Tuesday and Thursday. Turnaround time: 3-8 days.

Additional Information:
Includes C1EI activity, C1EI quantitation and C1q quantitation.

The results expected of these assays in the different clinical settings in which low C4 levels are seen are:

<table>
<thead>
<tr>
<th>Basis of Complement Abnormality</th>
<th>C1-esterase activity by C1r decay</th>
<th>Inhibitor Antigen Quantitation</th>
<th>C1q Antigen Quantitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereditary angioedema-Classic</td>
<td>Abnormal</td>
<td>Decreased</td>
<td>Normal</td>
</tr>
<tr>
<td>Hereditary angioedema-Variant</td>
<td>? Abnormal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Acquired</td>
<td>? Abnormal</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
<tr>
<td>Secondary involvement</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

Synonyms:
• Angioedema Panel
• C1-esterase inhibitor
• angioneurotic edema
• anti-C1r
• C1r
• C4DX/C4 ratio
• HAE
• HAN E
• Hereditary angioneurotic edema

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred

Sample Type:
Serum
EDTA Plasma for B&T patients

Collect:
Red top on ice (Gold top NOT acceptable)
Lavender top on ice for B&T patients

Amount to Collect:
6 mL blood

Preferred Volume:
3 mL serum in 3 aliquots of 1 mL each

Minimum Volume:
0.5 mL serum each

Remarks:
Collect and allow to clot in ice slurry. Bring immediately to lab on ice.

Note special sample requirements for B&T patients.

Unacceptable Conditions:
PROCESSING

Test Code:  
C1EI

Sendout:  
Yes

Performing Lab:  
Quest

Specimen Preparation:  
Centrifuge immediately under refrigeration. Freeze three separate aliquots at <= 60C in plastic tubes and ship on dry ice. Order Quest #44768P, 298 and 44784P

Note that LabCorp requires EDTA plasma for B&T patients.

Preferred Volume:  
3 mL serum in 3 aliquots of 1 mL each

Minimum Volume:  
0.5 mL serum each

Unacceptable Conditions:  
Not delivered on ice. Sample collected in Gold top

RESULT INTERPRETATION

Units:  
see normal ranges

Reference Interval:  
C1EI activity (by decay of C1r):  
Normal: > 67%  
Equivocal: 41-67%  
Abnormal: < 41%

C1EI quantitation: 11-26 mg/dL  
C1q quantitation: 5.0-8.6 mg/dL

Additional Information:  
Includes C1EI activity, C1EI quantitation and C1q quantitation.

The results expected of these assays in the different clinical settings in which low C4 levels are seen are:

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<td>Decreased</td>
</tr>
<tr>
<td>Secondary involvement</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:  
86161-90

LOINC Codes:  
4477-6

COMPLETE VIEW

Available Stat:  
No

Test Code:
Performing Lab:
Quest

Sendout:
Yes

Patient Preparation:
An 8 hour fast before specimen collection is preferred

Remarks:
Collect and allow to clot in ice slurry. Bring immediately to lab on ice.

Note special sample requirements for B&T patients.

Collect:
Red top on ice (Gold top NOT acceptable)
Lavender top on ice for B&T patients

Amount to Collect:
6 mL blood

Sample Type:
Serum
EDTA Plasma for B&T patients

Preferred Volume:
3 mL serum in 3 aliquots of 1 mL each

Minimum Volume:
0.5 mL serum each

Unacceptable Conditions:
Not delivered on ice. Sample collected in Gold top

Specimen Preparation:
Centrifuge immediately under refrigeration. Freeze three separate aliquots at <= 60C in plastic tubes and ship on dry ice. Order Quest # 44768P, 298 and 44784P

Note that LabCorp requires EDTA plasma for B&T patients.

Units:
see normal ranges

Reference Interval:
C1EI activity (by decay of C1r):
Normal: > 67%
Equivocal: 41-67%
Abnormal: < 41%

C1EI quantitation: 11-26 mg/dL
C1q quantitation: 5.0-8.6 mg/dL

Synonyms:
• Angioedema Panel
• C1-esterase inhibitor
• angioneurotic edema
• anti-C1r
• C1r
• C4DX/C4 ratio
• HAE
• HAN E
• Hereditary angioneurotic edema

Reported:
Test performed Tuesday and Thursday. Turnaround time: 3-8 days.

Additional Information:
Includes C1EI activity, C1EI quantitation and C1q quantitation.
The results expected of these assays in the different clinical settings in which low C4 levels are seen are:

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<thead>
<tr>
<th>Basis of Complement Abnormality</th>
<th>C1-esterase activity by C1r decay</th>
<th>Inhibitor Antigen Quantitation</th>
<th>C1q Antigen Quantitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hereditary angioedema-Classics</td>
<td>Abnormal</td>
<td>Decreased</td>
<td>Normal</td>
</tr>
<tr>
<td>Hereditary angioedema-Variant</td>
<td>? Abnormal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Acquired</td>
<td>? Abnormal</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
<tr>
<td>Secondary involvement</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
</tbody>
</table>

CPT Codes:
86161-90

LOINC Codes:
4477-6
C1Q Fixing Antibody - Class I
HTC1QAB1 (Sunquest: ILC1Q1)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.
This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum
Collect:
Red top x2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL serum
Remarks:
- SAMPLE COLLECTION GUIDE FOR ITL TESTS
- ITL (415) 476-3387
- Stability (from collection to initiation):
  - If kept at ambient temperature, can be good for up to 72 hours
- Unacceptable Conditions:
  - Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTC1QAB1 (Sunquest: ILC1Q1)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
6 mL serum

Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

RESULT INTERPRETATION

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:
86833

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTC1QAB1 (Sunquest: ILC1Q1)
Test Group:
HLA Antibody Testing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Luminex-based
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Red top x2
Amount to Collect:
12 mL blood
Sample Type:
Serum
Preferred Volume:
6 mL serum
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

This test is **NOT** for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
C1Q Fixing Antibody - Class II  
HTC1QAB2 (Sunquest: ILC1Q2)

ORDERING

Available Stat:  
Yes

Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:  
Luminex-based

Reported:  
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Additional Information:  
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

Reflex Testing:  
Yes

Synonyms:  
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:  
Serum

Collect:  
Red top x2

Amount to Collect:  
12 mL blood

Preferred Volume:  
6 mL serum

Remarks:  
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Stability (from collection to initiation):  
If kept at ambient temperature, can be good for up to 72 hours

Unacceptable Conditions:  
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:  
HTC1QAB2 (Sunquest: ILC1Q2)

Test Group:  
HLA Antibody Testing

Sendout:  
Yes

Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

---

**RESULT INTERPRETATION**

**Additional Information:**
- This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

---

**ADMINISTRATIVE**

**CPT Codes:**
- 86833

---

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTC1QAB2 (Sunquest: ILC1Q2)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**
- **SAMPLE COLLECTION GUIDE FOR ITL TESTS**
- ITL (415) 476-3387

**Collect:**
- Red top x2

**Amount to Collect:**
- 12 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
C3d Fixing Antibody - Class I
HT3CDAB1 (Sunquest: ILC3D1)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
• Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum
Collect:
Red top x2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL serum
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HT3CDAB1 (Sunquest: ILC3D1)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
RESULT INTERPRETATION

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:
86833

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HT3CDAB1 (Sunquest: ILC3D1)
Test Group:
HLA Antibody Testing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Luminex-based
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Red top x2
Amount to Collect:
12 mL blood
Sample Type:
Serum
Preferred Volume:
6 mL serum
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Synonyms:
• Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Reflex Testing:
Additional Information:

This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:

86833
C3d Fixing Antibody - Class II
HT3CDAB2 (Sunquest: ILC3D2)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Luminex-based
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information: This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing: Yes
Synonyms: Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type: Serum
Collect: Red top x2
Amount to Collect: 12 mL blood
Preferred Volume: 6 mL serum
Remarks: SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation): If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions: Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code: HT3CDAB2 (Sunquest: ILC3D2)
Test Group: HLA Antibody Testing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfer with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

---

**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

---

**ADMINISTRATIVE**

**CPT Codes:**
- 86833

---

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HT3CDAB2 (Sunquest: ILC3D2)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
- Red top x2

**Amount to Collect:**
- 12 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
C9ORF72 Repeat Expansion
ALSC9

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run once per month
Methodology: PCR and Southern blot
Reported: 4-6 weeks
Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) are neurodegenerative disorders characterized by progressive paralysis and cognitive decline, respectively. Although most of ALS and FTD cases are sporadic and idiopathic, approximately 5 - 10% of affected individuals follow a Mendelian pattern of an autosomal dominant inheritance. A hexanucleotide repeat (GGGGCC) located in the promoter region of the C9orf72 gene is strongly associated with familial cases of ALS and/or FTD and thus constitutes the basis of the present molecular diagnostic assay. Pathologic expansions (>30 repeats) can be used for the presymptomatic or symptomatic diagnosis of these disorders. Other mutations that cause ALS and/or FTD occur in the superoxide dismutase (SOD), RNA binding protein FUS (Fused in Sarcoma) and the transcriptional repressor TDP-43 genes. None of these mutations are covered by this assay.

The C9orf72 hexanucleotide repeat in negative individuals consists of up to 30 repeats. In most affected individuals, the repeat was shown to expand to 250-1600 repeats or more. The pathogenic expansions was found to be non-penetrant in carriers who were younger than 35 years of age, increasing to 50% penetrance by 58 years and to almost full penetrance by 80 years. There is also evidence of genetic anticipation in families segregating the pathogenic repeat showing an earlier age of onset in subsequent generations.

This test consists of two PCR assays that will detect first, the repeat size on alleles within the negative range of 1-30 repeats and second, the presence or absence of a positive expanded repeat. Positive expansions are reflexed to a Southern blot based-assay that will determine the approximate ranges of the expanded repeat.

Evidence of genetic counseling should be provided for any presymptomatic testing.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

Reflex Testing:
Positive expansions are reflexed to a Southern blot based-assay that will determine the approximate ranges of the expanded repeat.

Synonyms:
- FTD/ALS Hexanucleotide Repeat Expansion
- Frontotemporal Dementia
- Amyotropic lateral Sclerosis

COLLECTION

Sample Type:
EDTA whole blood, amniotic fluid, CVS; cultured cells

Note: Amniotic fluid and CVS collected at UCSF will be sent to Cytogenetics for culturing prior to testing. The tissue culture will be separately billed.

Collect:
Lavender top
Amount to Collect:
5 mL blood

Preferred Volume:
Peripheral blood in EDTA: 5 mL
Amniotic fluid: 20 mL
CVS: 20 mg
Cultured cells: T25 flask x2

Note: Amniotic fluid and CVS collected at UCSF will be sent to Cytogenetics for culturing prior to testing. The tissue culture will be separately billed

Minimum Volume:
Peripheral blood in EDTA: 2 mL
Amniotic fluid: 10 mL
CVS: 10 mg
Cultured cells: T25 flask x1

Remarks:
Do not collect sample in heparin. Avoid hemolysis. Keep sample refrigerated for overnight or longer storage. Do not freeze.

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week.

Unacceptable Conditions:
Heparinized samples. Low confluence cell cultures. Insufficient amount of amniotic fluid or chorionic villi

PROCESSING

Test Code:
ALSC9
Performing Lab:
Medical Genomics - Molecular Diagnostics
Specimen Preparation:
Do not centrifuge or freeze. Ship at room temp or 4C. Refrigerate samples for storage.

Preferred Volume:
Peripheral blood in EDTA: 5 mL
Amniotic fluid: 20 mL
CVS: 20 mg
Cultured cells: T25 flask x2

Note: Amniotic fluid and CVS collected at UCSF will be sent to Cytogenetics for culturing prior to testing. The tissue culture will be separately billed

Minimum Volume:
Peripheral blood in EDTA: 2 mL
Amniotic fluid: 10 mL
CVS: 10 mg
Cultured cells: T25 flask x1

Unacceptable Conditions:
Heparinized samples. Low confluence cell cultures. Insufficient amount of amniotic fluid or chorionic villi

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week.

RESULT INTERPRETATION

Reference Interval:
Negative for the hexanucleotide repeat expansion (1-30 repeats)

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) are neurodegenerative disorders characterized by progressive paralysis and cognitive decline, respectively. Although most of ALS and FTD cases are sporadic and idiopathic, approximately 5 - 10% of affected individuals follow a Mendelian pattern of an autosomal dominant inheritance. A hexanucleotide repeat (GGGGCC) located in
the promoter region of the C9orf72 gene is strongly associated with familial cases of ALS and/or FTD and thus constitutes the basis of the present molecular diagnostic assay. Pathologic expansions (>30 repeats) can be used for the presymptomatic or symptomatic diagnosis of these disorders. Other mutations that cause ALS and/or FTD occur in the superoxide dismutase (SOD), RNA binding protein FUS (Fused in Sarcoma) and the transcriptional repressor TDP-43 genes. None of these mutations are covered by this assay.

The C9orf72 hexanucleotide repeat in negative individuals consists of up to 30 repeats. In most affected individuals, the repeat was shown to expand to 250-1600 repeats or more. The pathogenic expansions was found to be non-penetrant in carriers who were younger than 35 years of age, increasing to 50% penetrance by 58 years and to almost full penetrance by 80 years. There is also evidence of genetic anticipation in families segregating the pathogenic repeat showing an earlier age of onset in subsequent generations.

This test consists of two PCR assays that will detect first, the repeat size on alleles within the negative range of 1-30 repeats and second, the presence or absence of a positive expanded repeat. Positive expansions are reflexed to a Southern blot based-assay that will determine the approximate ranges of the expanded repeat.

Evidence of genetic counseling should be provided for any presymptomatic testing.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.
separately billed

**Minimum Volume:**
- Peripheral blood in EDTA: 2 mL
- Amniotic fluid: 10 mL
- CVS: 10 mg
- Cultured cells: T25 flask x1

**Unacceptable Conditions:**
- Heparinized samples. Low confluence cell cultures. Insufficient amount of amniotic fluid or chorionic villi

**Specimen Preparation:**
- Do not centrifuge or freeze. Ship at room temp or 4°C. Refrigerate samples for storage.

**Reference Interval:**
Negative for the hexanucleotide repeat expansion (1-30 repeats)

**Synonyms:**
- FTD/ALS Hexanucleotide Repeat Expansion
- Frontotemporal Dimentia
- Amyotrophic lateral Sclerosis

**Stability (from collection to initiation):**
- Room temperature 3 days, refrigerated 1 week.

**Reported:**
- 4-6 weeks

**Reflex Testing:**
Positive expansions are reflexed to a Southern blot based-assay that will determine the approximate ranges of the expanded repeat.

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Amyotrophic lateral sclerosis (ALS) and fronotemporal dementia (FTD) are neurodegenerative disorders characterized by progressive paralysis and cognitive decline, respectively. Although most of ALS and FTD cases are sporadic and idiopathic, approximately 5 - 10% of affected individuals follow a Mendelian pattern of an autosomal dominant inheritance. A hexanucleotide repeat (GGGGCC) located in the promoter region of the C9orf72 gene is strongly associated with familial cases of ALS and/or FTD and thus constitutes the basis of the present molecular diagnostic assay. Pathologic expansions (>30 repeats) can be used for the presymptomatic or symptomatic diagnosis of these disorders. Other mutations that cause ALS and/or FTD occur in the superoxide dismutase (SOD), RNA binding protein FUS (Fused in Sarcoma) and the transcriptional repressor TDP-43 genes. None of these mutations are covered by this assay.

The C9orf72 hexanucleotide repeat in negative individuals consists of up to 30 repeats. In most affected individuals, the repeat was shown to expand to 250-1600 repeats or more. The pathogenic expansions was found to be non-penetrant in carriers who were younger than 35 years of age, increasing to 50% penetrance by 58 years and to almost full penetrance by 80 years. There is also evidence of genetic anticipation in families segregating the pathogenic repeat showing an earlier age of onset in subsequent generations.

This test consists of two PCR assays that will detect first, the repeat size on alleles within the negative range of 1-30 repeats and second, the presence or absence of a positive expanded repeat. Positive expansions are reflexed to a Southern blot based-assay that will determine the approximate ranges of the expanded repeat.

Evidence of genetic counseling should be provided for any presymptomatic testing.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

**CPT Codes:**
- 81479

**LDT or Modified FDA:**
- Yes
**Cadmium**

**CADM**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- ICP/MS

**Reported:**
- Test performed Monday-Friday. Turnaround time: 3-5 days.

### COLLECTION

**Patient Preparation:**
- Patient should refrain from eating seafood at least three days prior to specimen collection.

**Sample Type:**
- EDTA whole blood

**Collect:**
- Navy blue top (EDTA) tube

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 4 mL blood

**Minimum Volume:**
- 2 mL blood

**Remarks:**
- To avoid contamination during collection use powderless gloves.

  - Mix well, inverting gently 5x.

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 5 days, frozen at -20°C unacceptable

**Unacceptable Conditions:**
- Hemolyzed samples

**Rejection Criteria:**
- Room temp, frozen, hemolysis

### PROCESSING

**Test Code:**
- CADM

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Follow the detailed processing instructions for Trace Metal Analysis. Do not centrifuge or transfer to another container. Refrigerate DO NOT freeze. Order Quest # 299

**Preferred Volume:**
- 4 mL blood

**Minimum Volume:**
- 2 mL blood
Unacceptable Conditions:
  Hemolyzed samples

Rejection Criteria:
  Room temp, frozen, hemolysis

Stability (from collection to initiation):
  Room temperature 2 days, refrigerated 5 days, frozen at -20C unacceptable

RESULT INTERPRETATION

Units:
  µg/L (mcg/L)

Reference Interval:
  Non-smokers: < 1.7 µg/L
  >= 18 year old smokers: < 5.0 µg/L
  OSHA reference range: < 5.0 µg/L
  Potentially toxic: 30 µg/L

Critical Values:
  Quest Priority-1: >= 50 µg/L
  Quest Priority-2: 40.0-49.9 µg/L

ADMINISTRATIVE

CPT Codes:
  82300-90

LOINC Codes:
  5609-3

COMPLETE VIEW

Available Stat:
  No

Test Code:
  CADM

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  ICP/MS

Patient Preparation:
  Patient should refrain from eating seafood at least three days prior to specimen collection.

Remarks:
  To avoid contamination during collection use powderless gloves.
  Mix well, inverting gently 5x.

Collect:
  Navy blue top (EDTA) tube

Amount to Collect:
  4 mL blood

Sample Type:
  EDTA whole blood

Preferred Volume:
  4 mL blood

Minimum Volume:
  2 mL blood
Rejection Criteria:
- Room temp, frozen, hemolysis

Unacceptable Conditions:
- Hemolyzed samples

Specimen Preparation:
- Follow the detailed processing instructions for Trace Metal Analysis. Do not centrifuge or transfer to another container. Refrigerate DO NOT freeze. Order Quest # 299

Units:
- µg/L (mcg/L)

Reference Interval:
- Non-smokers: < 1.7 µg/L
- >= 18 year old smokers: < 5.0 µg/L
- OSHA reference range: < 5.0 µg/L
- Potentially toxic: 30 µg/L

Critical Values:
- Quest Priority-1: >= 50 µg/L
- Quest Priority-2: 40.0-49.9 µg/L

Stability (from collection to initiation):
- Room temperature 2 days, refrigerated 5 days, frozen at -20C unacceptable

Reported:
- Test performed Monday-Friday. Turnaround time: 3-5 days.

CPT Codes:
- 82300-90

LOINC Codes:
- 5609-3
Caffeine
CAFF

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Test run Monday-Friday mornings. Turnaround time: 1-4 days.
Additional Information:
Expected levels in individuals taking over-the-counter caffeine preparations are 3-6 mg/L.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
For therapeutic monitoring draw trough level just before next dose.
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20°C 1 month
Unacceptable Conditions:
Sample collected in Gold top

PROCESSING

Test Code:
CAFF
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum. Order Quest # 305
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Sample collected in Gold top
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20°C 1 month
RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Therapeutic: 8-20 mg/L
Potentially Toxic: > 50 mg/L

Additional Information:
Expected levels in individuals taking over-the-counter caffeine preparations are 3-6 mg/L.

ADMINISTRATIVE

CPT Codes:
80299-90

LOINC Codes:
3422-3

COMPLETE VIEW

Available Stat:
No

Test Code:
CAFF

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immun assay

Remarks:
For therapeutic monitoring draw trough level just before next dose.

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Sample collected in Gold top

Specimen Preparation:
Refrigerate serum. Order Quest # 305

Units:
mg/L

Reference Interval:
Therapeutic: 8-20 mg/L
Potentially Toxic: > 50 mg/L

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20C 1 month

Reported:
Test run Monday-Friday mornings. Turnaround time: 1-4 days.

Additional Information:
Expected levels in individuals taking over-the-counter caffeine preparations are 3-6 mg/L.

CPT Codes:
80299-90

LOINC Codes:
3422-3
Calcitonin

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Chemiluminescent Immunoassay
Reported:
Test set up Tuesday-Saturday. Turnaround time: 5-8 days
Additional Information:
Infant/toddler ranges obtained with the Nichols Institute Diagnostics calcitonin-IMCA (Clinical Chemistry 2004;50:1828-9)
Synonyms:
• CT
• thyrocalcitonin

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred
Sample Type:
Serum
Collect:
Red top or Gold Top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 1 day, frozen at -20C 28 days.
Rejection Criteria:
Room temperature sample

PROCESSING

Test Code:
CATN
Test Group:
Calcitonin
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze separated serum at -20C. Order Quest # 30742X
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

**Rejection Criteria:**
- Room temperature sample

**Stability (from collection to initiation):**
- Room temperature unacceptable, refrigerated 1 day, frozen at -20ºC 28 days.

## RESULT INTERPRETATION

**Units:**
- pg/mL

**Reference Interval:**
- >= 18 year old males: <= 10 pg/mL
- >= 18 year old females: <= 5 pg/mL

Pediatrics (Males and Females):
- < 6 months: <= 41 pg/mL
- 6 months-3 years: <= 14 pg/mL
- 3-17 years: <= 6 pg/mL

**Additional Information:**
- Infant/toddler ranges obtained with the Nichols Institute Diagnostics calcitonin-IMCA (Clinical Chemistry 2004;50:1828-9)

## ADMINISTRATIVE

**CPT Codes:**
- 82308-90

**LOINC Codes:**
- 1992-7

## COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- CATN

**Test Group:**
- Calcitonin

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Chemiluminescent Immunoassay

**Patient Preparation:**
- An 8 hour fast before specimen collection is preferred

**Collect:**
- Red top or Gold Top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Rejection Criteria:**
- Room temperature sample
Room temperature sample

**Specimen Preparation:**
Freeze separated serum at -20C. Order Quest # 30742X

**Units:**
pg/mL

**Reference Interval:**
- >= 18 year old males: <= 10 pg/mL
- >= 18 year old females: <= 5 pg/mL

Pediatrics (Males and Females):
- < 6 months: <= 41 pg/mL
- 6 months-3 years: <= 14 pg/mL
- 3-17 years: <= 6 pg/mL

**Synonyms:**
- CT
- thyrocalcitonin

**Stability (from collection to initiation):**
Room temperature unacceptable, refrigerated 1 day, frozen at -20C 28 days.

**Reported:**
Test set up Tuesday-Saturday. Turnaround time: 5-8 days

**Additional Information:**
Infant/toddler ranges obtained with the Nichols Institute Diagnostics calcitonin-IMCA (Clinical Chemistry 2004;50:1828-9)

**CPT Codes:**
82308-90

**LOINC Codes:**
1992-7
Calcitonin Stimulation Test
CATN

ORDERING

Available Stat:
No
Performing Lab:
Quest performs calcitonin testing
Reported:
Test set up Tuesday-Saturday. Turnaround time: 5-8 days
Additional Information:
The combined stimuli are usually reserved for those who do not respond to pentagastrin alone.

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred
Sample Type:
Serum
Amount to Collect:
2 mL blood per sample
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:

Pentagastrin stimulation:
Collect specimens taken before and 1, 2 and 5 minutes after the administration iv over 5 seconds of 0.5 µg/kg.

Pentagastrin/Calcium Infusion:
Give 2 mg/kg iv of elemental calcium (usually as the gluconate) at a constant rate over 1 min; followed immediately with iv pentagastrin as described above. Collect specimens at the same times.

PROCESSING

Test Code:
CATN x mult
Test Group:
Calcitonin
Sendout:
Yes
Performing Lab:
Quest performs calcitonin testing
Specimen Preparation:
Process individual specimens as described above; be sure to enter any descriptive information supplied. Freeze separated serum at -20C. Order Quest # 30742X
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION
Units:
- pg/mL

Reference Interval:
- Normal response:
  - Pentagastrin alone
    - Male: 1 or 2 min ≤ 106 pg/mL, at 5 min ≤ 106 pg/mL
    - Female: 1 or 2 min ≤ 29 pg/mL, at 5 min ≤ 23 pg/mL
  - Ca++ & Pentagastrin
    - Male: at 1 min ≤ 324 pg/mL, at 2 min 10-491 pg/mL, at 5 min 8-343 pg/mL, at 10 min ≤ 112 pg/mL
    - Female: at 1 min ≤ 41 pg/mL, at 2 min ≤ 70 pg/mL, at 5 min ≤ 39 pg/mL, at 10 min ≤ 23 pg/mL

Additional Information:
The combined stimuli are usually reserved for those who do not respond to pentagastrin alone.

ADMINISTRATIVE

CPT Codes:
- 82308-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- CATN x mult

Test Group:
- Calcitonin

Performing Lab:
- Quest performs calcitonin testing

Sendout:
- Yes

Patient Preparation:
- An 8 hour fast before specimen collection is preferred

Remarks:
- Pentagastrin stimulation:
  Collect specimens taken before and 1, 2 and 5 minutes after the administration iv over 5 seconds of 0.5 µg/kg.

- Pentagastrin/Calcium Infusion:
  Give 2 mg/kg iv of elemental calcium (usually as the gluconate) at a constant rate over 1 min; followed immediately with iv pentagastrin as described above. Collect specimens at the same times.

Amount to Collect:
- 2 mL blood per sample

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Specimen Preparation:
- Process individual specimens as described above; be sure to enter any descriptive information supplied. Freeze separated serum at -20C. Order Quest # 30742X

Units:
- pg/mL

Reference Interval:
- Normal response:
<table>
<thead>
<tr>
<th>Test</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pentagastrin alone</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 or 2 min</td>
<td>&lt;= 106 pg/mL</td>
<td>&lt;= 29 pg/mL</td>
</tr>
<tr>
<td>at 5 min</td>
<td>&lt;= 106 pg/mL</td>
<td>&lt;= 23 pg/mL</td>
</tr>
<tr>
<td><strong>Ca++ &amp; Pentagastrin</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 1 min</td>
<td>&lt;= 324 pg/mL</td>
<td>&lt;= 41 pg/mL</td>
</tr>
<tr>
<td>at 2 min</td>
<td>10-491 pg/mL</td>
<td>&lt;= 70 pg/mL</td>
</tr>
<tr>
<td>at 5 min</td>
<td>8-343 pg/mL</td>
<td>&lt;= 39 pg/mL</td>
</tr>
<tr>
<td>at 10 min</td>
<td>&lt;= 112 pg/mL</td>
<td>&lt;= 23 pg/mL</td>
</tr>
</tbody>
</table>

**Reported:**
Test set up Tuesday-Saturday. Turnaround time: 5-8 days

**Additional Information:**
The combined stimuli are usually reserved for those who do not respond to pentagastrin alone.

**CPT Codes:**
82308-90
Ionized calcium should be measured in situations where total calcium measurements may not accurately reflect the level of physiologically active free (ionized) calcium. Because equations proposed for estimating free calcium levels from measurements of total albumin and calcium are poor surrogates for true ionized calcium (1-4), direct measurements of ionized calcium should be obtained when free calcium levels are needed. Measurements of ionized calcium may be particularly useful in patients with: altered albumin concentration, acid-base disturbances, multiple myeloma, chronic kidney disease, organ transplants, borderline hypercalcemia, suspected hyperparathyroidism and normal or slightly elevated total calcium values, or symptoms of hypocalcemia despite a normal total calcium.

Note, however, that measurement of ionized calcium is significantly more labor intensive for laboratory staff than measurement of Total Calcium. In stable patients with the above abnormalities it may not be necessary to monitor the patient with repeated ionized calcium levels. In many situations determining both the ionized calcium and Total Calcium on the same sample allows the values to be compared and the patient can then be monitored with the Total Calcium alone.

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology:
- Ion selective electrode (ISE)
- Parnassus: Nova 8 CRT
- Mt. Zion: Gem Premier 3500
Reported: STAT 1 hour, Routine 3 hours
Additional Information:
- Source of adult reference range: 100 UCSF blood donors (revalidated on 50 donors in March 2009).
- Sources of pediatric reference ranges:

NOTE: the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).


Synonyms:
- iCa
- Free calcium
- Calcium, ionized
- calcium, free
**COLLECTION**

**Sample Type:**
- Plasma or serum

**Collect:**
- Light green top preferred, Gold top acceptable

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL plasma or serum

**Minimum Volume:**
- 0.3 mL plasma or serum

**Remarks:**
- Fill collection container completely. Deliver immediately to lab. Not acceptable as an "add-on" if tube has already been processed for other routine tests

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

**PROCESSING**

**Test Code:**
- CAI

**Test Group:**
- Calcium

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Specimen Preparation:**
- Do not centrifuge or open tube. Deliver immediately to Chemistry. Not acceptable as an "add-on" if tube has already been processed for other routine tests

**Preferred Volume:**
- 1 mL plasma or serum

**Minimum Volume:**
- 0.3 mL plasma or serum

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

**RESULT INTERPRETATION**

**Units:**
- mmol/L

**Reference Interval:**
- 0-1 month: 1.00-1.50 mmol/L
- 1-6 months: 0.95-1.50 mmol/L
- >= 6 months: 1.16-1.36 mmol/L

**Critical Values:**
- <0.80 mmol/L or > 1.55 mmol/L

**Note:** Panic values from Post-filter samples are not phoned.

**Additional Information:**
- Source of adult reference range: 100 UCSF blood donors (revalidated on 50 donors in March 2009).
- Sources of pediatric reference ranges:

NOTE - the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).


ADMINISTRATIVE

CPT Codes:
82330

LOINC Codes:
1995-0

COMPLETE VIEW

Available STAT:
Yes

Ordering Recommendations:

Ionized calcium should be measured in situations where total calcium measurements may not accurately reflect the level of physiologically active free (ionized) calcium. Because equations proposed for estimating free calcium levels from measurements of total albumin and calcium are poor surrogates for true ionized calcium (1-4), direct measurements of ionized calcium should be obtained when free calcium levels are needed. Measurements of ionized calcium may be particularly useful in patients with: altered albumin concentration, acid-base disturbances, multiple myeloma, chronic kidney disease, organ transplants, borderline hypercalcemia, suspected hyperparathyroidism and normal or slightly elevated total calcium values, or symptoms of hypocalcemia despite a normal total calcium.

Note, however, that measurement of ionized calcium is significantly more labor intensive for laboratory staff than measurement of Total Calcium. In stable patients with the above abnormalities it may not be necessary to monitor the patient with repeated ionized calcium levels. In many situations determining both the ionized calcium and Total Calcium on the same sample allows the values to be compared and the patient can then be monitored with the Total Calcium alone.

Test Code:
CAI

Test Group:
Calcium

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)
Parnassus: Nova 8 CRT
Mt. Zion: Gem Premier 3500

Remarks:
Fill collection container completely. Deliver immediately to lab. Not acceptable as an "add-on" if tube has already been processed for other routine tests
Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
2 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
1 mL plasma or serum

Minimum Volume:
0.3 mL plasma or serum

Unacceptable Conditions:
Delivered to lab > 30 min after collection

Specimen Preparation:
Do not centrifuge or open tube. Deliver immediately to Chemistry. Not acceptable as an "add-on" if tube has already been processed for other routine tests

Units:
mmol/L

Reference Interval:
0-1 month: 1.00-1.50 mmol/L
1-6 months: 0.95-1.50 mmol/L
>= 6 months: 1.16-1.36 mmol/L

Critical Values:
<0.80 mmol/L or > 1.55 mmol/L

Note: Panic values from Post-filter samples are not phoned.

Synonyms:
- iCa
- Free calcium
- Calcium, ionized
- calcium, free
- Ca
- Ca++

Reported:
STAT 1 hour, Routine 3 hours

Additional Information:
Source of adult reference range: 100 UCSF blood donors (revalidated on 50 donors in March 2009).

Sources of pediatric reference ranges:

NOTE - the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).


CPT Codes:
82330
LOINC Codes:
1995-0
Calcium, Ionized, post-filter

**ORDERING**

**Ordering Recommendations:**

This test should ONLY be ordered when testing post-filter samples in patients on dialysis with citrate anticoagulation. It should not be ordered for monitoring a patient's systemic ionized calcium level. See Calcium, Ionized, serum/plasma (CAI).

**Available Stat:**
Yes

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Ion selective electrode (ISE) - Nova 8 CRT

**Reported:**
STAT 1 hour, Routine 3 hours

**Additional Information:**

**NOTE** - the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).

**Synonyms:**
- iCa
- Free calcium
- Calcium, ionized
- calcium, free
- Ca
- Ca++

**COLLECTION**

**Sample Type:**
Plasma or serum

**Collect:**
Light green top preferred, Gold top acceptable

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.3 mL serum or plasma

**Remarks:**
Fill collection container completely. Deliver immediately to lab. Not acceptable as an "add-on" if tube has already been processed for other routine tests.

Note: Please submit sample in its own separate biohazard bag with Apex requisition before sending to the lab.

**Unacceptable Conditions:**
Delivered to lab > 30 min after collection

**PROCESSING**
Test Code:
  PCAI
Test Group:
  Calcium
Performing Lab:
  Parnassus & Mission Bay Chemistry
Specimen Preparation:
  Do not centrifuge or open tube. Deliver immediately to Chemistry. Not acceptable as an "add-on" if tube has already been processed for other routine tests
Preferred Volume:
  1 mL serum or plasma
Minimum Volume:
  0.3 mL serum or plasma
Unacceptable Conditions:
  Delivered to lab > 30 min after collection

RESULT INTERPRETATION

Units:
  mmol/L
Additional Information:
  NOTE - the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).

ADMINISTRATIVE

CPT Codes:
  82330
LOINC Codes:
  1995-0

COMPLETE VIEW

Available Stat:
  Yes
Ordering Recommendations:

  This test should ONLY be ordered when testing post-filter samples in patients on dialysis with citrate anticoagulation. It should not be ordered for monitoring a patient's systemic ionized calcium level. See Calcium, Ionized, serum/plasma (CAI).

Test Code:
  PCAI
Test Group:
  Calcium
Performing Lab:
  Parnassus & Mission Bay Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Ion selective electrode (ISE) - Nova 8 CRT
Remarks:
  Fill collection container completely. Deliver immediately to lab. Not acceptable as an "add-on" if tube has already been processed for other routine tests.
Note: Please submit sample in its own separate biohazard bag with Apex requisition before sending to the lab.

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
2 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

Unacceptable Conditions:
Delivered to lab > 30 min after collection

Specimen Preparation:
Do not centrifuge or open tube. Deliver immediately to Chemistry. Not acceptable as an "add-on" if tube has already been processed for other routine tests

Units:
mmol/L

Synonyms:
- iCa
- Free calcium
- Calcium, ionized
- calcium, free
- Ca
- Ca++

Reported:
STAT 1 hour, Routine 3 hours

Additional Information:
NOTE - the results for serum or plasma ionized calcium are adjusted (normalized) to a standard pH of 7.40. To obtain ionized calcium results that are not adjusted to a standard pH of 7.40, order whole blood ionized calcium (e.g., in patients with possible acid-base disturbances including those with symptoms of hypocalcemia suspected to be secondary to respiratory alkalosis).

CPT Codes:
82330

LOINC Codes:
1995-0
Calcium, Ionized, whole blood (MtZ Only)
CAIB

ORDERING

Available Stat:  Yes
Performing Lab:  Mt. Zion Chemistry
Performed:  Test available 24 hours per day 7 days per week
Methodology:  Ion selective electrode (ISE) - Gem Premier 3500
Reported:  Stat 15 min, Routine 30 min
Synonyms:  
- iCa
- Ca
- Ca++
- Free calcium
- Calcium, free
- Ionized calcium

COLLECTION

Sample Type:  Heparinized whole blood (Blood gas syringe only)
Collect:  Plastic syringe containing 100U of dry heparin. remove needle, expel any bubbles, cap syringe and transport immediately to lab.
Amount to Collect:  3 mL blood
Preferred Volume:  3 mL blood
Minimum Volume:  1 mL blood
Stability (from collection to initiation):  10 min.
Unacceptable Conditions:  Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume

PROCESSING

Test Code:  CAIB
Test Group:  Calcium
Performing Lab:  Mt. Zion Chemistry
Preferred Volume:  3 mL blood
Minimum Volume:  

Test information subject to change
1 mL blood

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume

Stability (from collection to initiation):
10 min.

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
<6 months: 0.95-1.50 mmol/L
>= 6 months: 1.15-1.29 mmol/L

Critical Values:
<0.80 mmol/L or > 1.55 mmol/L

ADMINISTRATIVE

CPT Codes:
82330

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CAIB

Test Group:
Calcium

Performing Lab:
Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE) - Gem Premier 3500

Collect:
Plastic syringe containing 100U of dry heparin. remove needle, expel any bubbles, cap syringe and transport immediately to lab.

Amount to Collect:
3 mL blood

Sample Type:
Heparinized whole blood (Blood gas syringe only)

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume

Units:
mmol/L

Reference Interval:
<6 months: 0.95-1.50 mmol/L
>= 6 months: 1.15-1.29 mmol/L

Critical Values:
<0.80 mmol/L or > 1.55 mmol/L

**Synonyms:**
- iCa
- Ca
- Ca++
- Free calcium
- Calcium, free
- Ionized calcium

**Stability (from collection to initiation):**
10 min.

**Reported:**
- Stat 15 min, Routine 30 min

**CPT Codes:**
- 82330
Calcium, total, 24 hour urine

ORDERING

Available Stat:  
No

Performing Lab:  
Parnassus & Mission Bay Chemistry

Performed:  
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:  
Ion selective electrode (ISE)

Reported:  
Day & evenings 4 hours. Samples received after 2000 hours will be tested the following day.

Additional Information:  
To convert mg/dL to mmol/L (SI units) multiply by 0.25.

Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


Synonyms:  
• Ca  
• Ca++

COLLECTION

Sample Type:  
24 hour urine collection

Collect:  
24 hour urine collection container

Amount to Collect:  
Entire 24 hour urine output.

Preferred Volume:  
2 mL urine

Minimum Volume:  
1 mL urine

Stability (from collection to initiation):  
Refrigerated 2 days

PROCESSING

Test Code:  
CAU

Test Group:  
Calcium

Performing Lab:  
Parnassus & Mission Bay Chemistry
Specimen Preparation:
Aliquot 1 mL and add 1 drop of 6N HCl to acidify.

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/D

Reference Interval:
Usually 100-300 mg/D

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.25.

Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


ADMINISTRATIVE

CPT Codes:
82340

COMPLETE VIEW

Available Stat:
No

Test Code:
CAU

Test Group:
Calcium

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Ion selective electrode (ISE)

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output.

Sample Type:
24 hour urine collection

Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine

Specimen Preparation:
Aliquot 1 mL and add 1 drop of 6N HCl to acidify.

Units:
mg/D

Reference Interval:
Usually 100-300 mg/D

Synonyms:
• Ca
• Ca++

Stability (from collection to initiation):
Refrigerated 2 days

Reported:
Day & evenings 4 hours. Samples received after 2000 hours will be tested the following day.

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.25.

Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


CPT Codes:
82340
Calcium, total, Plasma / Serum

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Ion selective electrode (ISE)
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
- To convert mg/dL to mmol/L (SI units) multiply by 0.25.
- A value < 4 or > 15 will automatically be reassayed.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


Synonyms:
- Ca
- Ca++

COLLECTION

Sample Type: Plasma or serum
Collect: Light green top preferred, Gold top acceptable
 Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

PROCESSING

Test Code: CA
Test Group: Calcium
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum

**Minimum Volume:**
0.2 mL plasma or serum

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

---

**RESULT INTERPRETATION**

**Units:**
mg/dL

**Reference Interval:**
- <1 year: 9.0-10.9 mg/dL
- >= 1 year: 8.8-10.3 mg/dL

**Note:**
3. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

**Critical Values:**
- <6.5 mg/dL or > 13.5 mg/dL

**Additional Information:**
- To convert mg/dL to mmol/L (SI units) multiply by 0.25.
- A value < 4 or > 15 will automatically be reassayed.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


---

**ADMINISTRATIVE**

**CPT Codes:**
82310

**LOINC Codes:**
17861-6

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**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- CA

**Test Group:**
- Calcium

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Ion selective electrode (ISE)
Collect:
  Light green top preferred, Gold top acceptable

Amount to Collect:
  1 mL blood

Sample Type:
  Plasma or serum

Preferred Volume:
  0.5 mL plasma or serum

Minimum Volume:
  0.2 mL plasma or serum

Units:
  mg/dL

Reference Interval:
  <1 year: 9.0-10.9 mg/dL
  >= 1 year: 8.8-10.3 mg/dL

Note:
  3. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

Critical Values:
  <6.5 mg/dL or > 13.5 mg/dL

Synonyms:
  • Ca
  • Ca++

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
  STAT 1 hour, Routine 4 hours

Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.25.

  A value < 4 or > 15 will automatically be reassayed.

  Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimag), Gadopentetate Dimeglumine (Magnevist), and Gadoteridol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


CPT Codes:
  82310

LOINC Codes:
  17861-6
Calcium, total, random urine
CAUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available day and evening shift only 7 days a week.
Methodology:
Ion selective electrode (ISE)
Reported:
Day & evenings 4 hours. Samples received after 2000 hours will be tested the following day.
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.25.
Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoteridiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


Synonyms:
• Ca
• Ca++

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
CAUR
Test Group:
Calcium
Performing Lab:
Parnassus & Mission Bay Chemistry
Specimen Preparation:
Aliquot 1 mL and add 1 drop of 6N HCl to acidify.
Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.25.

Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


ADMINISTRATIVE

CPT Codes:
82340

LOINC Codes:
17862-4

COMPLETE VIEW

Available Stat:
No

Test Code:
CAUR

Test Group:
Calcium

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available day and evening shift only 7 days a week.

Methodology:
Ion selective electrode (ISE)

Collect:
Urine cup

Sample Type:
Random urine

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Specimen Preparation:
Aliquot 1 mL and add 1 drop of 6N HCl to acidify.
Units:
mg/dL

Synonyms:
- Ca
- Ca++

Stability (from collection to initiation):
Refrigerated 2 days

Reported:
Day & evenings 4 hours. Samples received after 2000 hours will be tested the following day.

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.25.

Output varies with the diet. 24 hour specimens are preferable; a urine creatinine should be ordered on a spot specimen in order that any comparison of results in serial specimens can be normalized for creatinine excretion.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs use electrode methods for measurement of total and ionized calcium levels which have not been reported to be subject to the gadolinium interference.


CPT Codes:
82340

LOINC Codes:
17862-4
Calculi (Stone) Analysis
CALCLI

ORDERING

Ordering Recommendations:
Determine composition of calculi.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Reflectance Fourier Transform Infrared Spectroscopy/Quantitative Polarizing Microscopy

Reported:
1-4 days

Synonyms:
- Bile Stone
- Calculus (Stone) Analysis
- Calculus Analysis
- Kidney Stone
- Prostatic Stones
- Renal Calculi
- Renal Stone
- Stone
- Urinary Calculi
- Urinary Stone Analysis
- Urinary Tract Stone

COLLECTION

Collect:
Calculus specimen.

Remarks:
Calculi specimens transported in liquid or contaminated with blood require special handling which will delay analysis. Specimens that are wrapped in tape or embedded in wax will delay or prevent analysis and should not be submitted.

Stability (from collection to initiation):
Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Indefinitely

Storage/Transport Temperature:
Room temperature. Also acceptable: Frozen or refrigerated.

Unacceptable Conditions:
Any collection or shipping container with a needle attached.

PROCESSING

Test Code:
CALCLI

ARUP Test Code:
0099460

Sendout:
Yes

Performing Lab:
Printed 06/07/19
Test information subject to change
Specimen Preparation:
Air-dry calculi and transfer to an ARUP Standard Transport Tube. Larger calculi specimens may be transferred to a clean, empty urine cup (150 mL) or similar container.

Unacceptable Conditions:
Any collection or shipping container with a needle attached.

Stability (from collection to initiation):
Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Indefinitely

Storage/Transport Temperature:
Room temperature. Also acceptable: Frozen or refrigerated.

RESULT INTERPRETATION

Reference Interval:
By report

Interpretive Data:
Calculi are the products of physiological processes that yield crystalline compounds in a matrix of biological compounds and blood. Matrix components are not reported. The clinically significant crystalline components identified in calculi specimens are reported. Gross description may not be consistent with the composition determined by FTIR analysis.

ADMINISTRATIVE

CPT Codes:
82365

COMPLETE VIEW

Ordering Recommendations:
Determine composition of calculi.

Test Code:
CALCLI

ARUP Test Code:
0099460

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Reflectance Fourier Transform Infrared Spectroscopy/Quantitative Polarizing Microscopy

Remarks:
Calculi specimens transported in liquid or contaminated with blood require special handling which will delay analysis. Specimens that are wrapped in tape or embedded in wax will delay or prevent analysis and should not be submitted.

Collect:
Calculus specimen.

Unacceptable Conditions:
Any collection or shipping container with a needle attached.

Specimen Preparation:
Air-dry calculi and transfer to an ARUP Standard Transport Tube. Larger calculi specimens may be transferred to a clean, empty urine cup (150 mL) or similar container.

Reference Interval:
By report

Interpretive Data:
Calculi are the products of physiological processes that yield crystalline compounds in a matrix of biological compounds and blood. Matrix components are not reported. The clinically significant crystalline components identified in calculi specimens are reported. Gross description may not be consistent with the composition determined by FTIR analysis.

**Synonyms:**
- Bile Stone
- Calculus (Stone) Analysis
- Calculus Analysis
- Kidney Stone
- Prostatic Stones
- Renal Calculi
- Renal Stone
- Stone
- Urinary Calculi
- Urinary Stone Analysis
- Urinary Tract Stone

**Storage/Transport Temperature:**
- Room temperature. Also acceptable: Frozen or refrigerated.

**Stability (from collection to initiation):**
- Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Indefinitely

**Reported:**
- 1-4 days

**CPT Codes:**
- 82365

**Notes:**
- Calculi samples that are transported in liquid and received wet or bloody will be dried for 48-72 hours prior to analysis.
Calculi Risk Assessment, Urine

CRA

ORDERING

Ordering Recommendations:
Use for kidney stone risk assessment and monitoring. Panel includes calcium, chloride, citric acid, creatinine, magnesium, oxalate, pH, phosphorus, potassium, sodium, and uric acid.

Performing Lab:
ARUP

Performed:
Mon-Fri

Methodology:
Quantitative Spectrophotometry/Quantitative Enzymatic/Quantitative Ion-Selective Electrode

Reported:
1-7 days

Synonyms:
- Renal Stone Risk Panel II (Kidney Stone Risk Panel II, Urine)

COLLECTION

Collect:
24-hour urine. Refrigerate during collection.

Remarks:
Record total volume and collection time interval on transport tube and test request form.

Stability (from collection to initiation):
Room Temperature: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.

PROCESSING

Test Code:
CRA

ARUP Test Code:
2008708

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Thoroughly mix entire collection (24-hour) in one container. Transport four separate 4 mL aliquots of urine using Calculi Risk/Supersaturation Urine Collection Kit (ARUP supply# 46007). Available online through eSupply using ARUP Connect(TM) or contact Client Services at (800) 522-2787. Do not exceed 4 mL in tubes.

Aliquot according to the following specifications:
1st aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
2nd aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
3rd aliquot (pH 9): Transfer 4 mL urine into a Sodium Carbonate Tube. (Min: 4mL) Mix well. Freeze immediately.
4th aliquot: Transfer 4 mL urine into an Unpreserved Tube. (Min: 4 mL) Freeze immediately.

If collection kit is unavailable, transport four 4 mL unadjusted aliquots of urine.

Stability (from collection to initiation):
Room Temperature: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.
### Result Interpretation

**Reference Interval:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH, Urine</td>
<td>5.0-7.5</td>
</tr>
<tr>
<td>Calcium, Urine</td>
<td></td>
</tr>
<tr>
<td>Calcium free diet</td>
<td>5-40 mg/d</td>
</tr>
<tr>
<td>Low Calcium Diet</td>
<td>50-150 mg/d</td>
</tr>
<tr>
<td>Average Calcium</td>
<td>100-250 mg/d</td>
</tr>
<tr>
<td>High Calcium diet</td>
<td>Effective February 21, 2012 Greater than 250 mg/d</td>
</tr>
<tr>
<td>Oxalate, Urine</td>
<td></td>
</tr>
<tr>
<td>Creatinine, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus, Urine</td>
<td></td>
</tr>
<tr>
<td>Phosphorus, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td>51-286 mmol/d</td>
</tr>
<tr>
<td>Uric Acid, Urine</td>
<td>250-750 mg/d</td>
</tr>
<tr>
<td>Chloride, Urine</td>
<td>140-250 mmol/d</td>
</tr>
<tr>
<td>Citric Acid, Urine</td>
<td></td>
</tr>
<tr>
<td>Citric Acid, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Magnesium, Urine</td>
<td>Effective August 15, 2011 12-199 mg/d</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

**Printed 06/07/19**

Test information subject to change.
### Creatinine, Urine - per 24h
Refer to report

### Oxalate, Urine - per 24h
Refer to report

#### Phosphorus, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus, Urine - per volume</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

#### Sodium, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium, Urine</td>
<td>140-250 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

#### Uric Acid, Urine
250-750 mg/d

#### Chloride, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloride, Urine</td>
<td>140-250 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

#### Citric Acid, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

#### Magnesium, Urine
Effective August 15, 2011
12-199 mg/d

#### Potassium, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-8 years</td>
<td>140-700 mg/d</td>
<td>140-700 mg/d</td>
</tr>
<tr>
<td>9-12 years</td>
<td>300-1300 mg/d</td>
<td>300-1300 mg/d</td>
</tr>
<tr>
<td>13-17 years</td>
<td>500-2300 mg/d</td>
<td>400-1600 mg/d</td>
</tr>
<tr>
<td>18-50 years</td>
<td>1000-2500 mg/d</td>
<td>700-1600 mg/d</td>
</tr>
<tr>
<td>51-80 years</td>
<td>800-2100 mg/d</td>
<td>500-1400 mg/d</td>
</tr>
<tr>
<td>81 years and older</td>
<td>600-2000 mg/d</td>
<td>400-1300 mg/d</td>
</tr>
</tbody>
</table>

### ADMINISTRATIVE

**CPT Codes:**
82340; 82436; 82507; 83735; 83945; 83986; 84105; 84133; 84300; 84560

### COMPLETE VIEW

**Ordering Recommendations:**
Use for kidney stone risk assessment and monitoring. Panel includes calcium, chloride, citric acid, creatinine, magnesium, oxalate, pH, phosphorus, potassium, sodium, and uric acid.

**Test Code:**
CRA

**ARUP Test Code:**
2008708

**Performing Lab:**
ARUP

**Sendout:**
Yes

**Performed:**
Mon-Fri

**Methodology:**
Printed 06/07/19
Test information subject to change
Quantitative Spectrophotometry/Quantitative Enzymatic/Quantitative Ion-Selective Electrode

Remarks:
Record total volume and collection time interval on transport tube and test request form.

Collect:
24-hour urine. Refrigerate during collection.

Specimen Preparation:
Thoroughly mix entire collection (24-hour) in one container. Transport four separate 4 mL aliquots of urine using Calculi Risk/Supersaturation Urine Collection Kit (ARUP supply# 46007). Available online through eSupply using ARUP Connect(TM) or contact Client Services at (800) 522-2787. Do not exceed 4 mL in tubes. Aliquot according to the following specifications:
1st aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
2nd aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
3rd aliquot (pH 9): Transfer 4 mL urine into a Sodium Carbonate Tube. (Min: 4 mL) Mix well. Freeze immediately.
4th aliquot: Transfer 4 mL urine into an Unpreserved Tube. (Min: 4 mL) Freeze immediately.
If collection kit is unavailable, transport four 4 mL unadjusted aliquots of urine.

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH, Urine</strong></td>
<td>5.0-7.5</td>
</tr>
<tr>
<td>Calcium, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Calcium free diet: 5-40 mg/d</td>
<td>5-40 mg/d</td>
</tr>
<tr>
<td>Low Calcium Diet (800 mg/d or less)</td>
<td>50-150 mg/d</td>
</tr>
<tr>
<td>Average Calcium diet (about 800 mg/d)</td>
<td>100-250 mg/d</td>
</tr>
<tr>
<td>High Calcium diet (800 mg/d or greater)</td>
<td>Effective February 21, 2012</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Calcium/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Phosphorus, Urine - per volume</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td><strong>Component</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td>41-286 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Uric Acid, Urine</td>
<td>250-750 mg/d</td>
</tr>
<tr>
<td>Chloride, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Chloride, Urine</td>
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<tr>
<td>Creatinine, Urine - per 24h</td>
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</tr>
<tr>
<td>Citric Acid, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Citric Acid, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Magnesium, Urine</td>
<td>Effective August 15, 2011</td>
</tr>
<tr>
<td></td>
<td>12-199 mg/d</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td><strong>Components</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Reference Interval</strong></td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
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<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Component</td>
<td>Reference Interval</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>pH, Urine</td>
<td>5.0-7.5</td>
</tr>
<tr>
<td>Calcium, Urine</td>
<td></td>
</tr>
<tr>
<td>Calcium free diet: 5-40 mg/d</td>
<td>5-40 mg/d</td>
</tr>
<tr>
<td>Low Calcium Diet (800 mg/d or less)</td>
<td>50-150 mg/d</td>
</tr>
<tr>
<td>Average Calcium diet (about 800 mg/d)</td>
<td>100-250 mg/d</td>
</tr>
<tr>
<td>High Calcium diet (800 mg/d or greater)</td>
<td>Effective February 21, 2012</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Calcium/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine</td>
<td></td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus, Urine</td>
<td></td>
</tr>
<tr>
<td>Phosphorus, Urine - per volume</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td></td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td>51-286 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Uric Acid, Urine</td>
<td>250-750 mg/d</td>
</tr>
<tr>
<td>Chloride, Urine</td>
<td></td>
</tr>
<tr>
<td>Chloride, Urine</td>
<td>140-250 mmol/d</td>
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<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid, Urine</td>
<td></td>
</tr>
<tr>
<td>Citric Acid, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Magnesium, Urine</td>
<td>12-199 mg/d</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td></td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

### Synonyms:
- Renal Stone Risk Panel II (Kidney Stone Risk Panel II, Urine)

### Storage/Transport Temperature:
- Frozen.

### Stability (from collection to initiation):
- Room Temperature: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

### Reported:
- 1-7 days

### CPT Codes:
- 82340; 82436; 82507; 83735; 83945; 83986; 84105; 84133; 84300; 84560
Notes:

This panel includes the following tests: Calcium, Chloride, Citric Acid, Creatinine, Magnesium, Oxalate, pH, Phosphorus, Potassium, Sodium, and Uric Acid.
Calprotectin, fecal
CPRN

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Immunoassay
Reported: 5-7 days
Synonyms: • Fecal calprotectin

COLLECTION

Sample Type: Stool
Collect: Urine cup or clean leak proof container
Amount to Collect: 1 g stool
Preferred Volume: 1 g stool
Minimum Volume: 0.3 g stool
Remarks: Collect undiluted feces in clean, dry sterile leak proof container. Do not add fixative or preservative
Stability (from collection to initiation): Room temperature 11 days, refrigerated 11 days, frozen 1 year.

PROCESSING

Test Code: CPRN
Sendout: Yes
Performing Lab: Quest
Preferred Volume: 1 g stool
Minimum Volume: 0.3 g stool
Stability (from collection to initiation): Room temperature 11 days, refrigerated 11 days, frozen 1 year.

RESULT INTERPRETATION

Units: µg/g
Reference Interval: 

Printed 06/07/19
Test information subject to change
**Interpretive Data:**

Calprotectin in Crohn's disease and ulcerative colitis can be five to several thousand times above the reference population. Levels are usually 50 µg/g or less in healthy patients and with irritable bowel syndrom. Repeat testing in 4-6 weeks is suggested for borderline values.

**CPT Codes:**

83993-90

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

CPRN

**Performing Lab:**

Quest

**Sendout:**

Yes

**Methodology:**

Immunoassay

**Remarks:**

Collect undiluted feces in clean, dry sterile leak proof container. Do not add fixative or preservative

**Collect:**

Urine cup or clean leak proof container

**Amount to Collect:**

1 g stool

**Sample Type:**

Stool

**Preferred Volume:**

1 g stool

**Minimum Volume:**

0.3 g stool

**Units:**

µg/g

**Reference Interval:**

Normal: < 15.625 - 50 µg/g
Borderline: > 50 - 120 µg/g
Abnormal: > 120 µg/g

**Interpretive Data:**

Calprotectin in Crohn's disease and ulcerative colitis can be five to several thousand times above the reference population. Levels are usually 50 µg/g or less in healthy patients and with irritable bowel syndrom. Repeat testing in 4-6 weeks is suggested for borderline values.

**Synonyms:**

- Fecal calprotectin

**Stability (from collection to initiation):**

Room temperature 11 days, refrigerated 11 days, frozen 1 year.

**Reported:**

5-7 days

**CPT Codes:**

83993-90
Calreticulin, Exon 9 Mutation Analysis

CALR

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Batched assay performed once every 1-2 weeks
Methodology: PCR/Fragment analysis and Direct Sequencing
Reported: 10-14 days
Additional Information: Somatic calreticulin (CALR) exon 9 mutations have been reported in 70-84% of patients with essential thrombocythemia (ET) or primary myelofibrosis (PMF), without JAK2 or MPL mutations. The risk of thrombosis in patients with CALR-mutated ET was found to be significantly lower than in those with JAK2-mutated ET. These indel frameshift mutations occur in the C-terminus negatively charged domain of the CALR protein and result in a positively charged domain that exhibits cellular localization outside of the endoplasmic reticulum.
Synonyms:
- CALR

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 3 ml blood
Preferred Volume: 3 mL
Minimum Volume: 1 mL
Remarks: Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Stability (from collection to initiation): Refrigerated 1 week
Unacceptable Conditions: Do not freeze blood. Refrigerate sample if storage is required. Ship to China Basin Molecular Diagnostics

PROCESSING

Test Code: CALR
Performing Lab: Medical Genomics - Molecular Diagnostics
Specimen Preparation: Do not freeze blood. Refrigerate sample if storage is required. Ship to China Basin Molecular Diagnostics
Preferred Volume: 3 mL
Minimum Volume:
1 mL

Unacceptable Conditions:
Do not freeze blood. Refrigerate sample if storage is required. Ship to China Basin Molecular Diagnostics

Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Somatic calreticulin (CALR) exon 9 mutations have been reported in 70-84% of patients with essential thrombocythemia (ET) or primary myelofibrosis (PMF), without JAK2 or MPL mutations. The risk of thrombosis in patients with CALR-mutated ET was found to be significantly lower than in those with JAK2-mutated ET. These indel frameshift mutations occur in the C-terminus negatively charged domain of the CALR protein and result in a positively charged domain that exhibits cellular localization outside of the endoplasmic reticulum.

ADMINISTRATIVE

CPT Codes:
81219

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
CALR

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Batched assay performed once every 1-2 weeks

Methodology:
PCR/Fragment analysis and Direct Sequencing

Remarks:
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top

Amount to Collect:
3 ml blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Unacceptable Conditions:
Do not freeze blood. Refrigerate sample if storage is required. Ship to China Basin Molecular Diagnostics

Specimen Preparation:
Do not freeze blood. Refrigerate sample if storage is required. Ship to China Basin Molecular Diagnostics
Reference Interval:
Negative

Synonyms:
- CALR

Stability (from collection to initiation):
Refrigerated 1 week

Reported:
10-14 days

Additional Information:
Somatic calreticulin (CALR) exon 9 mutations have been reported in 70-84% of patients with essential thrombocythemia (ET) or primary myelofibrosis (PMF), without JAK2 or MPL mutations. The risk of thrombosis in patients with CALR-mutated ET was found to be significantly lower than in those with JAK2-mutated ET. These indel frameshift mutations occur in the C-terminus negatively charged domain of the CALR protein and result in a positively charged domain that exhibits cellular localization outside of the endoplasmic reticulum.

CPT Codes:
- 81219

LDT or Modified FDA:
Yes
Cancer Antigen 125
C125

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Tuesday, Friday (day shift)
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported: 1-4 days
Additional Information: Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on X3/19/2018. The Abbott Architect method reads approximately 30% higher than the Centaur method. No changes were made to the reference range.

The ARCHITECT CA 125 II Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

Synonyms:
- CA125
- C125

COLLECTION

Sample Type: Serum
Collect: Gold or Red top preferred. Dark green or light green acceptable.
Amount to Collect: 1 mL blood
Preferred Volume: 0.3 mL serum
Minimum Volume: 0.1 mL serum
Stability (from collection to initiation):
- Refrigerated (2-8°C): 7 days
- Frozen (-20°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.

Avoid multiple freeze-thaw cycles.
Storage/Transport Temperature: -20°C or colder

PROCESSING

Test Code: C125
Performing Lab: China Basin Chemistry
Specimen Preparation: Aliquot and freeze serum at -20°C.
Preferred Volume:
0.3 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-20°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.

Avoid multiple freeze-thaw cycles.

Storage/Transport Temperature:
-20°C or colder

RESULT INTERPRETATION

Units:
U/mL

Reference Interval:

Adult Female Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;36</td>
</tr>
</tbody>
</table>

Reference range adopted from Abbott (vendor) based on in-house verification study of 20 normal female normal volunteers (>18 years old) in the UCSF Laboratory.

Pediatric Female Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 4 months</td>
<td>2 - 22</td>
</tr>
<tr>
<td>4 months - &lt; 5 years</td>
<td>6 - 39</td>
</tr>
<tr>
<td>5 years - &lt; 11 years</td>
<td>5 - 30</td>
</tr>
<tr>
<td>11 years - &lt; 18 years</td>
<td>8 - 33</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Reference range is not established for males.

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on X3/19/2018. The Abbott Architect method reads approximately 30% higher than the Centaur method. No changes were made to the reference range.

The ARCHITECT CA 125 II Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

ADMINISTRATIVE

CPT Codes:
86304

LOINC Codes:
10334-1

COMPLETE VIEW

Available Stat:
No

Test Code:
C125
Performing Lab:
China Basin Chemistry

Performed:
Tuesday, Friday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
Gold or Red top preferred. Dark green or light green acceptable.

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Units:
U/mL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;36</td>
</tr>
</tbody>
</table>

Reference range adopted from Abbott (vendor) based on in-house verification study of 20 normal female normal volunteers (>18 years old) in the UCSF Laboratory.

Pediatric Female Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 4 months</td>
<td>2 - 22</td>
</tr>
<tr>
<td>4 months - &lt; 5 years</td>
<td>6-39</td>
</tr>
<tr>
<td>5 years - &lt; 11 years</td>
<td>5 - 30</td>
</tr>
<tr>
<td>11 years - &lt; 18 years</td>
<td>8-33</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Reference range is not established for males.

Synonyms:
- CA125
- C125

Storage/Transport Temperature:
-20°C or colder

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-20°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.

Avoid multiple freeze-thaw cycles.

Reported:
1-4 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on X3/19/2018. The Abbott Architect method reads approximately 30% higher than the Centaur method. No changes were made to the reference range.
The ARCHITECT CA 125 II Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

**CPT Codes:**
- 86304

**LOINC Codes:**
- 10334-1
Cancer Antigen 15-3
CA15

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Monday (day shift)
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported: 1-8 days
Additional Information:

The calibrators for the ARCHITECT CA 15-3 assay are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 15-3 standard available at this time.

CA 15-3 is a serum marker commonly elevated in patients with breast cancer. It is a useful prognostic marker with higher levels being associated with advanced disease stage, and it can be used to monitor patients during and following treatment. CA 15-3 is neither a sensitive nor specific marker for early disease and should not be used for screening purposes. A small proportion of apparently healthy individuals (up to 5% of the general population) have an elevated CA 15-3 level as well as some patients with liver disease and other types of carcinoma. Clin Chem 52:345-351 2006.

Not covered by Medicare for screening purposes (Medicare Bulletin 98-7, December, 1998)

Synonyms:
- CA15-3

COLLECTION

Sample Type: Serum
Collect:
Gold or red top preferred.
Dark green or light green acceptable.
Amount to Collect:
1 mL blood
Preferred Volume:
0.3 mL serum
Minimum Volume:
0.15 mL serum

PROCESSING

Test Code: CA15
Performing Lab: China Basin Chemistry
Specimen Preparation:
Freeze serum at -20°C.
Preferred Volume:
0.3 mL serum
Minimum Volume:
0.15 mL serum

RESULT INTERPRETATION

Units:
U/mL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;32</td>
</tr>
</tbody>
</table>

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 25 (18 years old) normal volunteers in the UCSF Laboratory.

Pediatric Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 1 week</td>
<td>3 - 24</td>
</tr>
<tr>
<td>1 week - &lt; 1 year</td>
<td>5 - 33</td>
</tr>
<tr>
<td>1 year - &lt; 18 years</td>
<td>4 - 21</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Additional Information:


The calibrators for the ARCHITECT CA 15-3 assay are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 15-3 standard available at this time.

CA 15-3 is a serum marker commonly elevated in patients with breast cancer. It is a useful prognostic marker with higher levels being associated with advanced disease stage, and it can be used to monitor patients during and following treatment. CA 15-3 is neither a sensitive nor specific marker for early disease and should not be used for screening purposes. A small proportion of apparently healthy individuals (up to 5% of the general population) have an elevated CA 15-3 level as well as some patients with liver disease and other types of carcinoma. Clin Chem 52:345-351 2006.

Not covered by Medicare for screening purposes (Medicare Bulletin 98-7, December, 1998)

ADMINISTRATIVE

CPT Codes:
86300

LOINC Codes:
6875-9

COMPLETE VIEW

Available Stat:
No

Test Code:
CA15

Performing Lab:
China Basin Chemistry

Performed:
Monday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
Gold or red top preferred.
Dark green or light green acceptable.

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Specimen Preparation:
Freeze serum at -20°C.

Units:
U/mL

Reference Interval:

<table>
<thead>
<tr>
<th>Adult Reference Range</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;32</td>
</tr>
</tbody>
</table>

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 25 (18 years old) normal volunteers in the UCSF Laboratory.

<table>
<thead>
<tr>
<th>Pediatric Reference Range</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 1 week</td>
<td>3 - 24</td>
</tr>
<tr>
<td>1 week - &lt; 1 year</td>
<td>5 - 33</td>
</tr>
<tr>
<td>1 year - &lt; 18 years</td>
<td>4 - 21</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Synonyms:
- CA15-3

Reported:
1-8 days

Additional Information:

The calibrators for the ARCHITECT CA 15-3 assay are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 15-3 standard available at this time.

CA 15-3 is a serum marker commonly elevated in patients with breast cancer. It is a useful prognostic marker with higher levels being associated with advanced disease stage, and it can be used to monitor patients during and following treatment. CA 15-3 is neither a sensitive nor specific marker for early disease and should not be used for screening purposes. A small proportion of apparently healthy individuals (up to 5% of the general population) have an elevated CA 15-3 level as well as some patients with liver disease and other types of carcinoma. Clin Chem 52:345-351 2006.

Not covered by Medicare for screening purposes (Medicare Bulletin 98-7, December, 1998)

CPT Codes:
- 86300

LOINC Codes:
- 6875-9
Cancer Antigen 19-9
CA19

ORDERING

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Tuesday, Friday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1-8 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 4/24/18. The Abbott Architect method reads approximately 49% lower for results 83 U/mL than the Centaur method. No significant changes were made to the reference range.

The ARCHITECT CA 19-9XR Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

CA 19-9 is a tumor-associated carbohydrate antigen that has been found to be elevated in the serum of some patients with cancers of the pancreas, stomach, colon, bile duct, ovaries, endometrium, or lung. The serum levels of this antigen can also be elevated in benign conditions such as pancreatitis, cholangitis, and endometriosis. Although the levels of CA19-9 tend to be higher in malignant versus benign conditions, there is a substantial overlap zone, and interlaboratory variability in the measurement of CA 19-9 appears to be substantial (CV ~30% in a recent CAP survey). In one recent study of patients with pancreatic cancer versus benign pancreatic disease, the sensitivity of an elevated CA 19-9 measurement was 76%, with a specificity of 87%.

Since the CA 19-9 antigen is closely related to the Lewis blood group antigens, patients who lack Lewis antigen (approximately 7% of the general public) cannot produce CA 19-9. Additionally, the secretor status of the patient will have an influence on CA 19-9 levels.


Synonyms:
- CA19-9
- CA19

COLLECTION

Sample Type:
Serum

Collect:
Gold or red top preferred.
Dark green or light green acceptable.

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-20°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.

Avoid multiple freeze-thaw cycles.
PROCESSING

Test Code:
CA19
Performing Lab:
China Basin Chemistry
Specimen Preparation:
Freeze serum at -20°C.
Preferred Volume:
0.3 mL serum
Minimum Volume:
0.15 mL serum
Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-20°C or colder): 12 months
If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.
Avoid multiple freeze-thaw cycles.

RESULT INTERPRETATION

Units:
U/mL
Reference Interval:
Adult Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;38</td>
</tr>
</tbody>
</table>

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 24 (18 years old) normal volunteers in the UCSF Laboratory.

Pediatric Reference Range

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 1 year</td>
<td>&lt;64</td>
</tr>
<tr>
<td>1 year - &lt; 18 years</td>
<td>&lt;41</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Additional Information:

Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 4/24/18. The Abbott Architect method reads approximately 49% lower for results 83 U/mL) than the Centaur method. No significant changes were made to the reference range.

The ARCHITECT CA 19-9XR Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

CA 19-9 is a tumor-associated carbohydrate antigen that has been found to be elevated in the serum of some patients with cancers of the pancreas, stomach, colon, bile duct, ovaries, endometrium, or lung. The serum levels of this antigen can also be elevated in benign conditions such as pancreatitis, cholangitis, and endometriosis. Although the levels of CA19-9 tend to be higher in malignant versus benign conditions, there is a substantial overlap zone, and interlaboratory variability in the measurement of CA 19-9 appears to be substantial (CV ~30% in a recent CAP survey). In one recent study of patients with pancreatic cancer versus benign pancreatic disease, the sensitivity of an elevated CA 19-9 measurement was 76%, with a specificity of 87%.

Since the CA 19-9 antigen is closely related to the Lewis blood group antigens, patients who lack Lewis antigen (approximately 7% of
the general public) cannot produce CA 19-9. Additionally, the secretor status of the patient will have an influence on CA 19-9 levels.


**ADMINISTRATIVE**

CPT Codes:
- 86301

LOINC Codes:
- 24108-3

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- CA19

Performing Lab:
- China Basin Chemistry

Performed:
- Tuesday, Friday (day shift)

Methodology:
- Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
- Gold or red top preferred.
- Dark green or light green acceptable.

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum

Preferred Volume:
- 0.3 mL serum

Minimum Volume:
- 0.15 mL serum

Specimen Preparation:
- Freeze serum at -20°C.

Units:
- U/mL

**Reference Interval:**

**Adult Reference Range**

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;=38</td>
</tr>
</tbody>
</table>

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 24 (18 years old) normal volunteers in the UCSF Laboratory.

**Pediatric Reference Range**

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (U/mL)</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>1 year - &lt; 18 years</td>
<td>&lt;=41</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.
Synonyms:
- CA19-9
- CA19

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-20°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells or serum separator gel.

Avoid multiple freeze-thaw cycles.

Reported:
1-8 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 4/24/18. The Abbott Architect method reads approximately 49% lower for results 83 U/mL than the Centaur method. No significant changes were made to the reference range.

The ARCHITECT CA 19-9XR Calibrators are manufactured volumetrically and are referenced to this standard prepared by Fujirebio Diagnostics, Inc. There is no internationally recognized CA 125 standard available at this time.

CA 19-9 is a tumor-associated carbohydrate antigen that has been found to be elevated in the serum of some patients with cancers of the pancreas, stomach, colon, bile duct, ovaries, endometrium, or lung. The serum levels of this antigen can also be elevated in benign conditions such as pancreatitis, cholangitis, and endometriosis. Although the levels of CA19-9 tend to be higher in malignant versus benign conditions, there is a substantial overlap zone, and interlaboratory variability in the measurement of CA 19-9 appears to be substantial (CV ~30% in a recent CAP survey). In one recent study of patients with pancreatic cancer versus benign pancreatic disease, the sensitivity of an elevated CA 19-9 measurement was 76%, with a specificity of 87%.

Since the CA 19-9 antigen is closely related to the Lewis blood group antigens, patients who lack Lewis antigen (approximately 7% of the general public) cannot produce CA 19-9. Additionally, the secretor status of the patient will have an influence on CA 19-9 levels.

CPT Codes:
86301

LOINC Codes:
24108-3
Cancer Antigen 27.29
C2729

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Turn around time: 7 days

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen 4 weeks

PROCESSING

Test Code:
C2729
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 20123P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen 4 weeks

RESULT INTERPRETATION

Units:
U/mL
Reference Interval:
<38 U/mL
CPT Codes:
   86300-90
LOINC Codes:
   17842-6

Available Stat:
   No
Test Code:
   C2729
Performing Lab:
   Quest
Sendout:
   Yes
Methodology:
   Immunoassay
Collect:
   Gold top or Red top
Amount to Collect:
   2 mL blood
Sample Type:
   Serum
Preferred Volume:
   1 mL serum
Minimum Volume:
   0.5 mL serum
Specimen Preparation:
   Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 20123P
Units:
   U/mL
Reference Interval:
   <38 U/mL
Stability (from collection to initiation):
   Room temperature 1 week, refrigerated 1 week, frozen 4 weeks
Reported:
   Turn around time: 7 days
CPT Codes:
   86300-90
LOINC Codes:
   17842-6
Carbamazepine
CZP

ORDERING

Available Stat:  
Yes
Performing Lab:  
Parnassus & Mission Bay Chemistry
Performed:  
Test available 24 hours per day 7 days a week
Methodology:  
Turbidimetric inhibition immunoassay (Beckman DxC800)
Reported:  
STAT 1 hour, Routine 4 hours
Additional Information:  
See the lab manual’s "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
Synonyms:  
• Tegretol

COLLECTION

Sample Type:  
Serum or plasma
Collect:  
Gold top or Light Green top
Amount to Collect:  
1 mL blood
Preferred Volume:  
0.5 mL serum or plasma
Minimum Volume:  
0.2 mL serum or plasma
Remarks:  
Time to steady state: 2-5 days. Indicate time of draw on requisition.
Stability (from collection to initiation):  
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:  
CZP
Performing Lab:  
Parnassus & Mission Bay Chemistry
Preferred Volume:  
0.5 mL serum or plasma
Minimum Volume:  
0.2 mL serum or plasma
Stability (from collection to initiation):  
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Therapeutic: 4-12 mg/L


Critical Values:
>15 mg/L

Additional Information:
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80156

LOINC Codes:
3432-2

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CZP

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days a week

Methodology:
Turbidimetric inhibition immunoassay (Beckman DxC800)

Remarks:
Time to steady state: 2-5 days. Indicate time of draw on requisition.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Units:
mg/L

Reference Interval:
Therapeutic: 4-12 mg/L


Critical Values:
>15 mg/L

Synonyms:
• Tegretol

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
Reported:
  STAT 1 hour, Routine 4 hours

Additional Information:
  See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
  80156

LOINC Codes:
  3432-2
Carbohydrate deficient transferrin, for Alcohol Abuse
CDTA

**ORDERING**

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Affinity chromatography, Mass Spectroscopy
Synonyms:
- Transferrin electrophoresis
- glycosylation
- Transferrin isoforms

**COLLECTION**

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.1 mL serum
Rejection Criteria:
Thawed, room temperature or refrigerated sample received.

**PROCESSING**

Test Code:
CDTA
Test Group:
Transferrin
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Separate and freeze serum at -20C. Transport frozen. Order Mayo test # 82425 for CDT on Adults.
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.1 mL serum
Rejection Criteria:
Thawed, room temperature or refrigerated sample received.

**RESULT INTERPRETATION**

Units:
Ratio

Reference Interval:
0.00-0.10

ADMINISTRATIVE

CPT Codes:
82373-90

COMPLETE VIEW

Available Stat:
No

Test Code:
CDTA

Test Group:
Transferrin

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Affinity chromatography, Mass Spectroscopy

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.1 mL serum

Rejection Criteria:
Thawed, room temperature or refrigerated sample received.

Specimen Preparation:
Separate and freeze serum at -20C. Transport frozen. Order Mayo test # 82425 for CDT on Adults.

Units:
Ratio

Reference Interval:
0.00-0.10

Synonyms:
- Transferrin electrophoresis
- glycosylation
- Transferrin isoforms

CPT Codes:
82373-90

Test information subject to change
Carbohydrate deficient transferrin, for Metabolic errors
CDT

ORDERING

**Available Stat:**
No

**Performing Lab:**
Mayo

**Methodology:**
Affinity chromatography ESI-MS

**Reported:**
Performed Monday, Wednesday, Friday. Turnaround 4-8 days

**Synonyms:**
- Transferrin electrophoresis
- Glycosylation: Transferrin isoforms

COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top, Gold top

**Amount to Collect:**
1.0 mL blood

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Stability (from collection to initiation):**
Frozen at -20C indefinite.

**Rejection Criteria:**
Thawed, room temperature or refrigerated sample received.

PROCESSING

**Test Code:**
CDT

**Test Group:**
Transferrin

**Sendout:**
Yes

**Performing Lab:**
Mayo

**Specimen Preparation:**
Separate and freeze serum at -20C. Transport frozen. Order Mayo test # 82414. Include patient age and reason for referral testing, if provided.

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Rejection Criteria:**
Thawed, room temperature or refrigerated sample received.
Stability (from collection to initiation): Frozen at -20C indefinite.

RESULT INTERPRETATION

Units: Ratio
Reference Interval:
Congenital disorders of glycosylation:
Mono-oligosaccharide/Di-oligosaccharide: <= 0.10
A-oligosaccharide/Di-oligosaccharide: <= 0.05

ADMINISTRATIVE

CPT Codes:
82373-90
LOINC Codes:
13999-8

COMPLETE VIEW

Available Stat:
No
Test Code:
CDT
Test Group:
Transferrin
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
Affinity chromatography ESI-MS
Collect:
Red top, Gold top
Amount to Collect:
1.0 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Rejection Criteria:
Thawed, room temperature or refrigerated sample received.
Specimen Preparation:
Separate and freeze serum at -20C. Transport frozen. Order Mayo test # 82414. Include patient age and reason for referral testing, if provided.
Units:
Ratio
Reference Interval:
Congenital disorders of glycosylation:
Mono-oligosaccharide/Di-oligosaccharide: <= 0.10
A-oligosaccharide/Di-oligosaccharide: <= 0.05

Printed 06/07/19
Test information subject to change
Synonyms:
  - Transferrin electrophoresis
  - Glycosylation: Transferrin isoforms

Stability (from collection to initiation):
  Frozen at -20C indefinite.

Reported:
  Performed Monday, Wednesday, Friday. Turnaround 4-8 days

CPT Codes:
  82373-90

LOINC Codes:
  13999-8
Carbon Dioxide, Total, Plasma / Serum
CO2AN

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
pH electrode, using bicarbonate and sample CO2

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation:

Na - (CL + CO2)

The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

Synonyms:
- CO2
- Anion gap
- Bicarbonate

COLLECTION

Sample Type:
Plasma or serum

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
CO2AN

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
0 - 15 years: 16 - 30 mmol/L
>= 16 years: 22 - 32 mmol/L

1. Normal range for 0 to 15 year old children adapted from Beckman Coulter’s “Pediatric Reference Range Guidelines for Synchron Systems” Bulletin 9345
2. Normal range for >18y adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range adapted for children 16-18 years

Critical Values:
<15 mmol/L or > 40 mmol/L

Additional Information:
The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation:

Na - (CL + CO2)

The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

ADMINISTRATIVE

CPT Codes:
82374

LOINC Codes:
2028-9

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CO2AN

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
pH electrode, using bicarbonate and sample CO2

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mmol/L

Reference Interval:
0 - 15 years: 16 - 30 mmol/L
>= 16 years: 22 - 32 mmol/L

1. Normal range for 0 to 15 year old children adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
2. Normal range for >18y adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range adapted for children 16-18 years

**Critical Values:**
- <15 mmol/L or > 40 mmol/L

**Synonyms:**
- CO2
- Anion gap
- Bicarbonate

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation:

  \[ \text{Na} - (\text{CL} + \text{CO2}) \]

- The calculation is automatic whenever **all three** of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

**CPT Codes:**
- 82374

**LOINC Codes:**
- 2028-9
Carcinoembryonic Antigen
CEA

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Monday, Wednesday, Friday (day shift)
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported: 1-4 days
Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 3/19/2018. The Abbott Architect method reads approximately 63% higher than the Centaur method. Please note that the reference ranges have changed.
The Architect CEA internal standards are traceable to the World Health Organization (WHO) 1st International Standard 73/601 for CEA at each concentration level. Architect CEA Calibrators are manufactured by dilution and tested against these internal reference standards.
Synonyms:
• CEA

COLLECTION

Sample Type: Serum
Collect: Gold or Red Top
Amount to Collect: 1 mL blood
Preferred Volume: 0.3 mL serum
Minimum Volume: 0.1 mL serum
Stability (from collection to initiation):
Room Temperature: 24 hours
Refrigerated (2-8°C): 7 days

If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.
Avoid more than 5 freeze/thaw cycles.
Storage/Transport Temperature: -20°C or colder

PROCESSING

Test Code: CEA
Test Group: Carcinoembryonic Antigen
Performing Lab: China Basin Chemistry
Specimen Preparation:
Aliquot and freeze at -20°C.

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Room Temperature: 24 hours
Refrigerated (2-8°C): 7 days

If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.

Avoid more than 5 freeze/thaw cycles.

Storage/Transport Temperature:
-20°C or colder

RESULT INTERPRETATION

Units:
µg/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;5.1</td>
</tr>
</tbody>
</table>

Reference range adopted from vendor (Abbott) based on in-house verification study of 24 lab (>18 years old) normal volunteers in the UCSF Laboratory.

Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 7 days</td>
<td>8.1 - 62.0</td>
</tr>
<tr>
<td>7 days - &lt; 2 years</td>
<td>&lt;4.8</td>
</tr>
<tr>
<td>2 years - &lt; 18 years</td>
<td>&lt;2.7</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Additional Information:

Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 3/19/2018. The Abbott Architect method reads approximately 63% higher than the Centaur method. Please note that the reference ranges have changed.

The Architect CEA internal standards are traceable to the World Health Organization (WHO) 1st International Standard 73/601 for CEA at each concentration level. Architect CEA Calibrators are manufactured by dilution and tested against these internal reference standards.

ADMINISTRATIVE

CPT Codes:
82378

LOINC Codes:
2039-6

COMPLETE VIEW

Available Stat:
No

Test Code:
CEA
Test Group:
  Carcinoembryonic Antigen
Performing Lab:
  China Basin Chemistry
Performed:
  Monday, Wednesday, Friday (day shift)
Methodology:
  Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Collect:
  Gold or Red Top
Amount to Collect:
  1 mL blood
Sample Type:
  Serum
Preferred Volume:
  0.3 mL serum
Minimum Volume:
  0.1 mL serum
Specimen Preparation:
  Aliquot and freeze at -20°C.
Units:
  µg/L
Reference Interval:
  Adult Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;= 18 years</td>
<td>&lt;5.1</td>
</tr>
</tbody>
</table>

Reference range adopted from vendor (Abbott) based on in-house verification study of 24 lab (>=18 years old) normal volunteers in the UCSF Laboratory.

Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Range (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - &lt; 7 days</td>
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</tr>
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<td>7 days - &lt; 2 years</td>
<td>&lt;4.8</td>
</tr>
<tr>
<td>2 years - &lt; 18 years</td>
<td>&lt;2.7</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Synonyms:
  • CEA
Storage/Transport Temperature:
  -20°C or colder
Stability (from collection to initiation):
  Room Temperature: 24 hours
  Refrigerated (2-8°C): 7 days
  If testing will be delayed more than 7 days, remove serum from clot, red blood cells, or serum separator gel and store at -20°C or colder.
  Avoid more than 5 freeze/thaw cycles.
Reported:
  1-4 days
Additional Information:
  Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 3/19/2018. The Abbott Architect method reads approximately 63% higher than the Centaur method. Please note that the reference ranges have changed.

The Architect CEA internal standards are traceable to the World Health Organization (WHO) 1st International Standard 73/601 for CEA at each concentration level. Architect CEA Calibrators are manufactured by dilution and tested against these internal reference
standards.

CPT Codes:
82378

LOINC Codes:
2039-6
Carcinoembryonic Antigen, Pancreatic cyst fluid

CEAP

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Immunoenzymatic
Reported:
Performed Monday-Friday. Turnaround time 2-3 days
Additional Information:
An interpretive report will be provided
Synonyms:
- CEA

COLLECTION

Sample Type:
Pancreatic cyst fluid
Collect:
Red top or clean container
Amount to Collect:
1 mL fluid
Preferred Volume:
1 mL fluid
Minimum Volume:
0.5 mL fluid

PROCESSING

Test Code:
CEAP
Test Group:
Carcinoembryonic Antigen
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Indicate source of Pancreatic Cyst fluid (result on entry), transport specimen in plastic vial, ship frozen. Order Mayo test #89509.
Preferred Volume:
1 mL fluid
Minimum Volume:
0.5 mL fluid

RESULT INTERPRETATION

Units:
ng/mL
Additional Information:
An interpretive report will be provided

**ADMINISTRATIVE**

CPT Codes:
- 82378-90

**COMPLETE VIEW**

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Code:</td>
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<tr>
<td>Test Group:</td>
<td>Carcinoembryonic Antigen</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Mayo</td>
</tr>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Immunoenzymatic</td>
</tr>
<tr>
<td>Collect:</td>
<td>Red top or clean container</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>1 mL fluid</td>
</tr>
<tr>
<td>Sample Type:</td>
<td>Pancreatic cyst fluid</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL fluid</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL fluid</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Indicate source of Pancreatic Cyst fluid (result on entry), transport specimen in plastic vial, ship frozen. Order Mayo test #89509.</td>
</tr>
<tr>
<td>Units:</td>
<td>ng/mL</td>
</tr>
<tr>
<td>Synonyms:</td>
<td>● CEA</td>
</tr>
<tr>
<td>Reported:</td>
<td>Performed Monday-Friday. Turnaround time 2-3 days</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>An interpretive report will be provided</td>
</tr>
</tbody>
</table>

CPT Codes:
- 82378-90
Carnitine, plasma
CARN

ORDERING

Available Stat:
No
Performing Lab:
Lucille Packard Children’s Hospital
Methodology:
Stable isotope dilution LC-MS/MS
Reported:
Run 2x per week, turnaround 7-9 days
Additional Information:
Free and Total carnitine levels are measured. Results include a calculation of the ratio of acylcarnitine (esterified fraction) to free carnitine. The test is used to identify patients with either primary carnitine deficiency (i.e. carnitine uptake defect) or secondary carnitine deficiency arising from inherited defects in fatty acid or organic acid metabolism.

COLLECTION

Sample Type:
Heparinized plasma (Note: Serum is required for B&T patients)
Collect:
Dark Green top (Do not use Light green top)
Note: Red or Gold top required for B&T patients
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma (Serum for B&T patients)
Minimum Volume:
0.5 mL plasma (Serum for B&T patients)

PROCESSING

Test Code:
CARN
Test Group:
Carnitine
Sendout:
Yes
Performing Lab:
Lucille Packard Children’s Hospital
Specimen Preparation:
Separate plasma and freeze at -20C. Ship frozen via Medical Courier to Lucille Packard Children’s Hospital.
LabCorp requires serum for testing
Preferred Volume:
1 mL plasma (Serum for B&T patients)
Minimum Volume:
0.5 mL plasma (Serum for B&T patients)

RESULT INTERPRETATION

Units:
μmol/L

Reference Interval:
- Total carnitine: 20-71 μmole/L
- Free carnitine: 18-69 μmole/L
- Acyl/Free ratio: 0.1-0.4

Additional Information:
Free and Total carnitine levels are measured. Results include a calculation of the ratio of acylcarnitine (esterified fraction) to free carnitine. The test is used to identify patients with either primary carnitine deficiency (i.e. carnitine uptake defect) or secondary carnitine deficiency arising from inherited defects in fatty acid or organic acid metabolism.

ADMINISTRATIVE

CPT Codes:
- 82379-90

LOINC Codes:
- 14288-5

COMPLETE VIEW

Available Stat:
- No

Test Code:
- CARN

Test Group:
- Carnitine

Performing Lab:
- Lucille Packard Children's Hospital

Sendout:
- Yes

Methodology:
- Stable isotope dilution LC-MS/MS

Collect:
- Dark Green top (Do not use Light. green top)
- Note: Red or Gold top required for B&T patients

Amount to Collect:
- 2 mL blood

Sample Type:
- Heparinized plasma (Note: Serum is required for B&T patients)

Preferred Volume:
- 1 mL plasma (Serum for B&T patients)

Minimum Volume:
- 0.5 mL plasma (Serum for B&T patients)

Specimen Preparation:
- Separate plasma and freeze at -20°C. Ship frozen via Medical Courier to Lucille Packard Children's Hospital.

LabCorp requires serum for testing

Units:
- μmol/L

Reference Interval:
- Total carnitine: 20-71 μmole/L
- Free carnitine: 18-69 μmole/L
- Acyl/Free ratio: 0.1-0.4

Reported:
- Run 2x per week, turnaround 7-9 days

Additional Information:
Free and Total carnitine levels are measured. Results include a calculation of the ratio of acylcarnitine (esterified fraction) to free carnitine.
carnitine. The test is used to identify patients with either primary carnitine deficiency (i.e. carnitine uptake defect) or secondary carnitine deficiency arising from inherited defects in fatty acid or organic acid metabolism.

**CPT Codes:**
- 82379-90

**LOINC Codes:**
- 14288-5
Carnitine, urine
UCARN

ORDERING

Available Stat:
No
Performing Lab:
Lucille-Packard Children's Hospital
Methodology:
Stable Isotope Dilution, Tandem Mass Spec
Reported:
5-7 days
Synonyms:
- Free and total carnitine

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
4 mL
Preferred Volume:
4 mL
Minimum Volume:
2 mL

PROCESSING

Test Code:
UCARN
Test Group:
Carnitine
Sendout:
Yes
Performing Lab:
Lucille-Packard Children's Hospital
Specimen Preparation:
Freeze at -20C and ship on dry ice to China Basin sendouts.
Preferred Volume:
4 mL
Minimum Volume:
2 mL

RESULT INTERPRETATION

Units:
Free Carnitine, Urine: nmol/mg Creatinine
Total Carnitine, Urine: nmol/mg Creatinine
Acyl/Free Carnitine Ratio
Reference Interval:
Free Carnitine, Urine: 10-270 nmol/mg Cr
Total Carnitine, Urine: 75-500 nmol/mg Cr
Acyl/Free Carnitine Ratio, Urine: 0.5-5.0 ratio

**ADMINISTRATIVE**

CPT Codes:
- 82379-90

LOINC Codes:
- 2047-9

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- UCARN

Test Group:
- Carnitine

Performing Lab:
- Lucille-Packard Children's Hospital

Sendout:
- Yes

Methodology:
- Stable Isotope Dilution, Tandem Mass Spec

Collect:
- Urine cup

Amount to Collect:
- 4 mL

Sample Type:
- Random urine

Preferred Volume:
- 4 mL

Minimum Volume:
- 2 mL

Specimen Preparation:
- Freeze at -20C and ship on dry ice to China Basin sendouts.

Units:
- Free Carnitine, Urine: nmol/mg Creatinine
- Total Carnitine, Urine: nmol/mg Creatinine
- Acyl/Free Carnitine Ratio

Reference Interval:
- Free Carnitine, Urine: 10-270 nmol/mg Cr
- Total Carnitine, Urine: 75-500 nmol/mg Cr
- Acyl/Free Carnitine Ratio, Urine: 0.5-5.0 ratio

Synonyms:
- Free and total carnitine

Reported:
- 5-7 days

CPT Codes:
- 82379-90

LOINC Codes:
- 2047-9
Carotene
CARO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test run Monday-Friday. Turnaround time: 2-6 days.
Additional Information:
This test was developed and its performance characteristics determined by Quest Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred
Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Wrap tube in Aluminum foil to protect from light.

PROCESSING

Test Code:
CARO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate serum as soon as possible after clotting. Wrap tube in Aluminum foil to protect from light and refrigerate. Order Quest #20537P.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION

Units:
µg/dL (mcg/dL)
Reference Interval:

PEDIATRIC
9 mo-6 years: < 48 µg/dL
7-17 years: < 95 µg/dL

>= 18 YEARS OLD
Males: 4-51 µg/dL
Females: 6-77 µg/dL

Additional Information:
This test was developed and its performance characteristics determined by Quest Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
82380-90

LOINC Codes:
2053-7

Available Stat:
No

Test Code:
CARO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
An 8 hour fast before specimen collection is preferred

Remarks:
Wrap tube in Aluminum foil to protect from light.

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Separate serum as soon as possible after clotting. Wrap tube in Aluminum foil to protect from light and refrigerate. Order Quest # 20537P.

Units:
µg/dL (mcg/dL)

Reference Interval:
PEDIATRIC
9 mo-6 years: < 48 µg/dL
7-17 years: < 95 µg/dL

>= 18 YEARS OLD
Males: 4-51 µg/dL
Females: 6-77 µg/dL

Reported:

Test run Monday-Friday. Turnaround time: 2-6 days.

Additional Information:

This test was developed and its performance characteristics determined by Quest Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:

82380-90

LOINC Codes:

2053-7
Cashew Nut Component
CCOMP

ORDERING

Performing Lab: Quest
Performed: Tuesday-Saturday
Methodology: Immunoassay
Reported: 1-3 days
Additional Information: This test tests for the Cashew Nut component (rAna o 3).
Syonyms:
- Cashew Nut Component IgE
- rAna o 3 Ab, IgE

COLLECTION

Sample Type: Serum
Collect: Gold or Red-top
Amount to Collect: 1.0 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation):
Room Temperature and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature: Frozen

PROCESSING

Test Code: CCOMP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94470.
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation):
Room Temperature and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION

Units:
- kU/L

Reference Interval:
- <0.10

Additional Information:
- This test tests for the Cashew Nut component (rAna o 3).

ADMINISTRATIVE

CPT Codes:
- 86008

LOINC Codes:
- 82539-8

COMPLETE VIEW

Test Code:
- CCOMP
Performing Lab:
- Quest
Sendout:
- Yes
Performed:
- Tuesday-Saturday
Methodology:
- Immunoassay
Collect:
- Gold or Red-top
Amount to Collect:
- 1.0 mL blood
Sample Type:
- Serum
Preferred Volume:
- 0.5 mL serum
Minimum Volume:
- 0.3 mL serum
Specimen Preparation:
- Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94470.
Units:
- kU/L
Reference Interval:
- <0.10
Synonyms:
- Cashew Nut Component IgE
- rAna o 3 Ab, IgE
Storage/Transport Temperature:
- Frozen
Stability (from collection to initiation):
- Room Temperature and Refrigerated: 14 days
Frozen: 30 days

**Reported:**
1-3 days

**Additional Information:**
This test tests for the Cashew Nut component (rAna o 3).

**CPT Codes:**
86008

**LOINC Codes:**
82539-8
Catecholamines, Fractionated, 24-hour Urine
UCAF

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: HPLC w/ECD
Reported: Test run Monday-Friday. Turnaround time: 2-5 days.
Additional Information:
  - To convert µg/d to nmol/d (SI units), multiply Epinephrine value by 5.46, Norepinephrine by 5.91, Dopamine by 6.53.
  - A creatinine level is measured on the same sample of urine; if total creatinine excretion is not within normal limits for patient age and sex and the patient has normal renal function, the urine collection is probably incomplete and the results invalid.

Synonyms:
  - Adrenaline
  - catechols
  - dopamine
  - noradrenaline
  - norepinephrine
  - epinephrine

COLLECTION

Patient Preparation:
  - It is preferable for the patient to be off medications for three days prior to collection. However, common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Patients should avoid alcohol, coffee, tea, tobacco or strenuous exercise during the period of collection.

Sample Type:
  - 24 hour urine collection

Collect:
  - 24 hour urine collection container

Amount to Collect:
  - Entire 24 hour urine output

Preferred Volume:
  - 10 mL urine

Minimum Volume:
  - 5 mL urine

PROCESSING

Test Code: UCAF
Test Group: Catecholamines
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:

pH of the collected urine should be < 3. Record total urine volume on request. Refrigerate aliquot promptly. Order Quest # 4168N.

Preferred Volume:

10 mL urine

Minimum Volume:

5 mL urine

RESULT INTERPRETATION

Units:

µg/24 hours (mcg/24 hours)

Reference Interval:

Epinephrine
3-8 years  1-7 µg/d
9-12 years <= 8 µg/d
13-17 years <= 11 µg/d
> 17 years  2-24 µg/d

Norepinephrine
3-8 years  5-41 µg/d
9-12 years  5-50 µg/d
13-17 years 12-88 µg/d
> 17 years  15-100 µg/d

Dopamine
3-8 years  80-378 µg/d
9-12 years  51-474 µg/d
13-17 years 51-645 µg/d
> 17 years  52-480 µg/d

Total Nor + Ep
3-8 years  9-51 µg/d
9-12 years  9-71 µg/d
13-17 years 13-90 µg/d
> 17 years  26-121 µg/d

Additional Information:

To convert µg/d to nmol/d (SI units), multiply Epinephrine value by 5.46, Norepinephrine by 5.91, Dopamine by 6.53.

A creatinine level is measured on the same sample of urine; if total creatinine excretion is not within normal limits for patient age and sex and the patient has normal renal function, the urine collection is probably incomplete and the results invalid.

ADMINISTRATIVE

CPT Codes:

82384-90

LOINC Codes:

27055-3

COMPLETE VIEW

Available Stat:

No

Test Code:

UCAF

Test Group:

Catecholamines
Performing Lab:
Quest
Sendout:
Yes
Methodology:
HPLC w/ECD
Patient Preparation:
It is preferable for the patient to be off medications for three days prior to collection. However, common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Patients should avoid alcohol, coffee, tea, tobacco or strenuous exercise during the period of collection.
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Sample Type:
24 hour urine collection
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Specimen Preparation:
pH of the collected urine should be < 3. Record total urine volume on request. Refrigerate aliquot promptly. Order Quest # 4168N.
Units:
µg/24 hours (mcg/24 hours)
Reference Interval:
Epinephrine
3-8 years  1-7 µg/d
9-12 years <= 8 µg/d
13-17 years <= 11 µg/d
> 17 years  2-24 µg/d
Norepinephrine
3-8 years   5-41 µg/d
9-12 years  5-50 µg/d
13-17 years 12-88 µg/d
> 17 years  15-100 µg/d
Dopamine
3-8 years   80-378 µg/d
9-12 years  51-474 µg/d
13-17 years 51-645 µg/d
> 17 years  52-480 µg/d
Total Nor + Ep
3-8 years   9-51 µg/d
9-12 years  9-71 µg/d
13-17 years 13-90 µg/d
> 17 years  26-121 µg/d
Synonyms:
- Adrenaline
- catechols
- dopamine
- noradrenaline
- norepinephrine
- epinephrine
Reported:
Test run Monday-Friday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/d to nmol/d (SI units), multiply Epinephrine value by 5.46, Norepinephrine by 5.91, Dopamine by 6.53.

A creatinine level is measured on the same sample of urine; if total creatinine excretion is not within normal limits for patient age and sex and the patient has normal renal function, the urine collection is probably incomplete and the results invalid.

CPT Codes:
82384-90

LOINC Codes:
27055-3
Catecholamines, Fractionated, random urine
UCAFR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Set up 5x per week. Turnaround 5-7 days.

Synonyms:
- Adrenaline
- catechols
- dopamine
- noradrenaline
- norepinephrine
- epinephrine

COLLECTION

Patient Preparation:
Preferable for patient to be off all medications for 3 days prior to collection. Common antihypertensives, diuretics, ACE inhibitors, calcium channel blockers, Alpha- and Beta- blockers cause minimal or no interference. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection.

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL urine
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Stability (from collection to initiation):
Room temperature 1 week (if acidified), refrigerated 1 month (if acidified), frozen at -20C 7 weeks

PROCESSING

Test Code:
UCAFR
Test Group:
Catecholamines
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Add 6N HCl to sample to maintain pH < 3 and freeze 10 mL aliquot. If 6N HCl is not available, freeze sample asap. order Quest test # 5244
Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Stability (from collection to initiation):
Room temperature 1 week (if acidified), refrigerated 1 month (if acidified), frozen at -20C 7 weeks

RESULT INTERPRETATION

Units:
µg/g Creatinine (mcg/g Creatinine)

ADMINISTRATIVE

CPT Codes:
82384-90, 82570-90

LOINC Codes:
2057-8

COMPLETE VIEW

Available Stat:
No

Test Code:
UCAFR

Test Group:
Catecholamines

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
Preferable for patient to be off all medications for 3 days prior to collection. Common antihypertensives, diuretics, ACE inhibitors, calcium channel blockers, Alpha- and Beta- blockers cause minimal or no interference. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection.

Collect:
Urine cup

Amount to Collect:
10 mL urine

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Add 6N HCl to sample to maintain pH < 3 and freeze 10 mL aliquot. If 6N HCl is not available, freeze sample asap. order Quest test # 5244

Units:
µg/g Creatinine (mcg/g Creatinine)

Synonyms:
- Adrenaline
- catechols
• dopamine
• noradrenaline
• norepinephrine
• epinephrine

**Stability (from collection to initiation):**
Room temperature 1 week (if acidified), refrigerated 1 month (if acidified), frozen at -20C 7 weeks

**Reported:**
Set up 5x per week. Turnaround 5-7 days.

**CPT Codes:**
82384-90, 82570-90

**LOINC Codes:**
2057-8
CD138 positive cell selection for FISH
CD138, BCD138

ORDERING

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Monday - Friday day shift

Methodology:
Fluorescent in situ hybridization

Reported:
1-2 weeks

Synonyms:
- Multiple myeloma
- CD138 cell isolation
- CD138
- BCD138

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow aspirate. Bone marrow core biopsy

Collect:
Dark green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Stability (from collection to initiation):
2 days

Unacceptable Conditions:
Frozen, leaking or unlabeled tubes

PROCESSING

Test Code:
BCD138: Blood
CD138: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Do not centrifuge or freeze sample. Send to Cytogenetics at China basin for processing.

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled tubes

Stability (from collection to initiation):
- 2 days

CPT Codes:
- 88299

LDT or Modified FDA:
- Yes

Test Code:
- BCD138: Blood
- CD138: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Monday - Friday day shift

Methodology:
- Fluorescent in situ hybridization

Collect:
- Dark green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
- Heparinized whole blood or bone marrow aspirate. Bone marrow core biopsy

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled tubes

Specimen Preparation:
- Do not centrifuge or freeze sample. Send to Cytogenetics at China basin for processing.

Synonyms:
- Multiple myeloma
- CD138 cell isolation
- CD138
- BCD138

Stability (from collection to initiation):
- 2 days

Test information subject to change.
Reported:
   1-2 weeks
CPT Codes:
   88299
LDT or Modified FDA:
   Yes
**CD3 dose estimation**

**CD3D**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- BMT Lab

**Performed:**
- Test performed Monday-Friday at 0800, 1300, and 1500 hours.

**Methodology:**
- Flow cytometry

**Reported:**
- 3 hours after receipt of sample or next day.

**Additional Information:**
- This test can be ordered with the CD34 assay and performed on the same sample.

Immunology will report the percentage of the total WBCs which are CD3 cells. From the leukopheresis volume, the total leukocyte count in the pheresis, and the patient’s weight, the Blood Bank will calculate the absolute number of CD3-positive cells (T lymphocytes) per kg to be infused into the patient.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**Synonyms:**
- CD3% for dosing calculations
- Flow cytometry

### COLLECTION

**Sample Type:**
- EDTA whole blood or Apheresis sample

**Collect:**
- Lavender top for blood or Yellow top (ACD) for pheresis sample.

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 1 mL blood

**Minimum Volume:**
- 0.5 mL blood

**Remarks:**
- Specimens must reach the main laboratory a minimum of 30 minutes prior to the next scheduled run.

- Testing on Saturday requires prior arrangement with HPCT Lab.

### PROCESSING

**Test Code:**
- CD3D

**Test Group:**
- CD

**Performing Lab:**
- BMT Lab

**Specimen Preparation:**
- Notify HPCT (x31789) when a specimen arrives at Central Processing. Samples are prepared from leukopheresis and must be
delivered to Immunology before 1200 hours.

**Preferred Volume:**

1 mL blood

**Minimum Volume:**

0.5 mL blood

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**RESULT INTERPRETATION**

**Reference Interval:**

Not applicable

**Additional Information:**

This test can be ordered with the CD34 assay and performed on the same sample.

Immunology will report the percentage of the total WBCs which are CD3 cells. From the leukopheresis volume, the total leukocyte count in the pheresis, and the patient's weight, the Blood Bank will calculate the absolute number of CD3-positive cells (T lymphocytes) per kg to be infused into the patient.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

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**ADMINISTRATIVE**

**CPT Codes:**

86359

**LDT or Modified FDA:**

Yes

**LOINC Codes:**

20599-7

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**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

CD3D

**Test Group:**

CD

**Performing Lab:**

BMT Lab

**Performed:**

Test performed Monday-Friday at 0800, 1300, and 1500 hours.

**Methodology:**

Flow cytometry

**Remarks:**

Specimens must reach the main laboratory a minimum of 30 minutes prior to the next scheduled run.

Testing on Saturday requires prior arrangement with HPCT Lab.

**Collect:**

Lavender top for blood or Yellow top (ACD) for pheresis sample.

**Amount to Collect:**

1 mL blood

**Sample Type:**

EDTA whole blood or Apheresis sample

**Preferred Volume:**

1 mL blood

**Minimum Volume:**
0.5 mL blood

**Specimen Preparation:**

Notify HPCT (x31789) when a specimen arrives at Central Processing. Samples are prepared from leukopheresis and must be delivered to Immunology before 1200 hours.

**Reference Interval:**

Not applicable

**Synonyms:**

- CD3% for dosing calculations
- flow cytometry

**Reported:**

3 hours after receipt of sample or next day.

**Additional Information:**

This test can be ordered with the CD34 assay and performed on the same sample.

Immunology will report the percentage of the total WBCs which are CD3 cells. From the leukopheresis volume, the total leukocyte count in the pheresis, and the patient’s weight, the Blood Bank will calculate the absolute number of CD3-positive cells (T lymphocytes) per kg to be infused into the patient.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**

- 86359

**LDT or Modified FDA:**

- Yes

**LOINC Codes:**

- 20599-7
Cell Count and Differential, body fluid
CCDB

**ORDERING**

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Hemocytometer for cell count, Wright stained cytospin preparation for differential

Reported:
STAT 1 hour. Routine 4 hours

Additional Information:
Cell counts and differentials on biliary fluid have not proven to be useful, due to the disruption of the cellular elements by bile acids, and are thus not offered for this specimen type. An assessment for the presence of WBC in biliary drainage fluid is included in the examination of biliary fluid for crystals.

Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the reported WBC is 0 x 10^9/L.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

**Synonyms:**
- Body fluid cell count
- pleural fluid cell count
- peritoneal fluid cell count
- synovial fluid cell count
- Pericardial fluid cell count
- joint fluid cell count

**COLLECTION**

Sample Type:
Body Fluid

Collect:
Lavender top or Dark Green top

Amount to Collect:
See preferred volume

Preferred Volume:
>2 mL fluid

Minimum Volume:
1 mL fluid

Remarks:
Deliver samples IMMEDIATELY to the laboratory. Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):

Pleural, Pericardial, Peritoneal & Bronchoalveolar Lavage (BAL): Delay in analysis will cause cell lysis, cellular degeneration, and bacterial growth which can affect the test results. Samples received two (2) hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Cellular degeneration can begin within one hour of collection, interpret results accordingly. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.

Synovial: Delayed interpretation of synovial fluids may lead to false-negative findings. Studies have shown that WBC's disintegrate with time. Based on a small in-house study performed on refrigerated samples, WBC decreased by ~10% at 6 hours; although the proportion
of cell loss may depend on the types of WBC's present. Studies have also shown that crystals such as CPPD dissolve with time. MSU crystals remained stable for several weeks.

Unacceptable Conditions:
Sample received in a syringe with needle attached.

PROCESSING

Test Code:
CCDB

Test Group:
Cell Count and Differential

Performing Lab:
Parnassus & Mission Bay Hematology

Specimen Preparation:
Deliver sample immediately to Hematology for testing.

Preferred Volume:
>2 mL fluid

Minimum Volume:
1 mL fluid

Unacceptable Conditions:
Sample received in a syringe with needle attached.

Stability (from collection to initiation):

Pleural, Pericardial, Peritoneal & Bronchoalveolar Lavage (BAL): Delay in analysis will cause cell lysis, cellular degeneration, and bacterial growth which can affect the test results. Samples received two (2) hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Cellular degeneration can begin within one hour of collection, interpret results accordingly. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.

Synovial: Delayed interpretation of synovial fluids may lead to false-negative findings. Studies have shown that WBC's disintegrate with time. Based on a small in-house study performed on refrigerated samples, WBC decreased by ~10% at 6 hours; although the proportion of cell loss may depend on the types of WBC's present. Studies have also shown that crystals such as CPPD dissolve with time. MSU crystals remained stable for several weeks.

RESULT INTERPRETATION

Units:

$x_{10^9}/L$ (this is equivalent to $x_{10^3}/mm^3$ or $x_{10^3}/µL$)

Reference Interval:
The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.

Critical Values:
Samples positive for microorganisms from normally sterile sites

Additional Information:
Cell counts and differentials on biliary fluid have not proven to be useful, due to the disruption of the cellular elements by bile acids, and are thus not offered for this specimen type. An assessment for the presence of WBC in biliary drainage fluid is included in the examination of biliary fluid for crystals.

Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the reported WBC is 0 $x_{10^9}/L$.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

ADMINISTRATIVE

CPT Codes:
89051

LOINC Codes:
34557-9
Available Stat: Yes  
Test Code: CCDB  
Test Group: Cell Count and Differential  
Performing Lab: Parnassus & Mission Bay Hematology  
Performed: Test available 24 hours per day 7 days per week  
Methodology: Hemocytometer for cell count, Wright stained cytospin preparation for differential  
Remarks: Deliver samples IMMEDIATELY to the laboratory. Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.

Collect: Lavender top or Dark Green top  
Amount to Collect: See preferred volume  
Sample Type: Body Fluid  
Preferred Volume: >2 mL fluid  
Minimum Volume: 1 mL fluid  
Unacceptable Conditions: Sample received in a syringe with needle attached.  
Specimen Preparation: Deliver sample immediately to Hematology for testing.

Units: x10⁹/L (this is equivalent to x10³/mm³ or x10³/µL)  
Reference Interval: The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.  
Critical Values: Samples positive for microorganisms from normally sterile sites  
Synonyms:  
- Body fluid cell count  
- pleural fluid cell count  
- peritoneal fluid cell count  
- synovial fluid cell count  
- Pericardial fluid cell count  
- joint fluid cell count  

Stability (from collection to initiation):  
Pleural, Pericardial, Peritoneal & Bronchoalveolar Lavage (BAL): Delay in analysis will cause cell lysis, cellular degeneration, and bacterial growth which can affect the test results. Samples received two (2) hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Cellular degeneration can begin within one hour of collection, interpret results accordingly. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.  

Synovial: Delayed interpretation of synovial fluids may lead to false-negative findings. Studies have shown that WBC's disintegrate with time. Based on a small in-house study performed on refrigerated samples, WBC decreased by ~10% at 6 hours; although the proportion of cell loss may depend on the types of WBC's present. Studies have also shown that crystals such as CPPD dissolve with time. MSU
crystals remained stable for several weeks.

**Reported:**
- STAT 1 hour. Routine 4 hours

**Additional Information:**
Cell counts and differentials on biliary fluid have not proven to be useful, due to the disruption of the cellular elements by bile acids, and are thus not offered for this specimen type. An assessment for the presence of WBC in biliary drainage fluid is included in the examination of biliary fluid for crystals.

Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the reported WBC is 0 x $10^9$/L.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

**CPT Codes:**
- 89051

**LOINC Codes:**
- 34557-9
Cell Count and Differential, CSF
CCDC

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Hemocytometer for count and Wright stained cytocentrifuge preparation for differential

Reported:
Stat 1 hour, Routine 2 hours

Additional Information:
Count is performed on 3rd tube unless otherwise specified. Count not performed on first tube if it is grossly more bloody than tube #3 or if tube #3 count is < 7 RBC x10^6/L.

Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the WBC is 0 x 10^6/L.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

COLLECTION

Sample Type:
CSF

Collect:
LP kit tube #3 preferred, sterile collection tube acceptable

Amount to Collect:
See preferred volume

Preferred Volume:
1 mL CSF

Remarks:
Number tubes in order of withdrawal; deliver IMMEDIATELY. Do not use Lavender top, which will alter cellular morphology. Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.

Cerebrospinal fluid (CSF) specimens should be transported at ambient temperature as soon as possible after collection. Cellular degeneration of CSF can begin within one hour of collection.

Stability (from collection to initiation):
Specimen should be evaluated within two (2) hours of collection. Cellular degeneration of CSF can occur within one hour of collection.

PROCESSING

Test Code:
CCDC

Test Group:
Cell Count and Differential

Performing Lab:
Parnassus & Mission Bay Hematology

Specimen Preparation:
Deliver to Hematology right after sample is received and entered in Sunquest.

Preferred Volume:
1 mL CSF

Stability (from collection to initiation):
Specimen should be evaluated within two (2) hours of collection. Cellular degeneration of CSF can occur within one hour of collection.

RESULT INTERPRETATION

Units:
\[ \times 10^6/L \] (this is equivalent to /\text{mm}^3 \text{ or } /\mu\text{L} )

Reference Interval:
- Appearance: Clear
- Xanthochromia: Negative
- WBC: < 6 \times 10^6/L
- RBC: None
- Neutrophils: None

A reference range has not been established by the UCSF Clinical Laboratory for CSF WBC differential, except for neutrophil parameter. Clinical correlation required for interpretation.

Critical Values:
- Samples positive for microorganisms

Additional Information:
- Count is performed on 3rd tube unless otherwise specified. Count not performed on first tube if it is grossly more bloody than tube #3 or if tube #3 count is < 7 RBC \times 10^6/L.

- Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the WBC is 0 \times 10^6/L.

- If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

ADMINISTRATIVE

CPT Codes:
- 89051

LOINC Codes:
- 34564-5

COMPLETE VIEW

Available Stat:
- Yes

Test Code:
- CCDC

Test Group:
- Cell Count and Differential

Performing Lab:
- Parnassus & Mission Bay Hematology

Performed:
- Test available 24 hours per day 7 days per week

Methodology:
- Hemocytometer for count and Wright stained cytocentrifuge preparation for differential

Remarks:
- Number tubes in order of withdrawal; deliver IMMEDIATELY. Do not use Lavender top, which will alter cellular morphology. Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.

- Cerebrospinal fluid (CSF) specimens should be transported at ambient temperature as soon as possible after collection. Cellular degeneration of CSF can begin within one hour of collection.

Collect:
- LP kit tube #3 preferred, sterile collection tube acceptable

Amount to Collect:
- See preferred volume

Sample Type:
CSF

Preferred Volume:
1 mL CSF

Specimen Preparation:
Deliver to Hematology right after sample is received and entered in Sunquest.

Units:
\( \times 10^6/L \) (this is equivalent to \(/\text{mm}^3\) or \(/\mu\text{L}\))

Reference Interval:
- Appearance: Clear
- Xanthochromia: Negative
- WBC: < 6 \( \times 10^6/L \)
- RBC: None
- Neutrophils: None

A reference range has not been established by the UCSF Clinical Laboratory for CSF WBC differential, except for neutrophil parameter. Clinical correlation required for interpretation.

Critical Values:
- Samples positive for microorganisms

Stability (from collection to initiation):
Specimen should be evaluated within two (2) hours of collection. Cellular degeneration of CSF can occur within one hour of collection.

Reported:
- Stat 1 hour, Routine 2 hours

Additional Information:
- Count is performed on 3rd tube unless otherwise specified. Count not performed on first tube if it is grossly more bloody than tube #3 or if tube #3 count is < 7 RBC \( \times 10^6/L \).

  Note: Cell differentials are performed on a concentrated sample. Therefore a differential can be reported even if the WBC is 0 \( \times 10^6/L \).

  If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

CPT Codes:
- 89051

LOINC Codes:
- 34564-5
Central Blood Culture
P061

ORDERING

Performing Lab:
Microbiology

Performed:
Daily, all shifts

Methodology:
Culture

Reported:
Up to 6 days

Additional Information:
Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

Reflex Testing:
If bacteria are detected they are identified and susceptibility testing is performed as appropriate.

COLLECTION

Sample Type:
Blood

Collect:
Paired blood culture bottles (BD BACTEC Plus Aerobic and Lytic Anaerobic bottles)

Amount to Collect:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight:
< 1 kg = 1 mL for aerobic only (0.5 mL for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Preferred Volume:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

Minimum Volume:
Adults: 10 mL total (5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 mL for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Remarks:
1. Adults:
Collect 2 sets of cultures from different sites.
Collect at least one set of cultures from a peripheral site.

2. Pediatrics:
Amount of blood depends on weight of patient (see weight based minimums). Anaerobic sample should be sent only in the following circumstances: Outpatients, patients with immunodeficiency, malignancy or after bone or human stem cell transplant, patients with gastrointestinal disorder, or at physician's request due to concern for anaerobes. Sending only an aerobic specimen is sufficient for all other patient populations.

3. Clarify which line(s) to obtain sample from with the provider.

4. Remove plastic cap of each bottle and scrub top of each bottle with 70% alcohol prep pad.

5. Obtain sample. Instill sample into blood culture bottles. Refer to Blood Culture Methods (General) procedure in Nursing Procedures.
Manual.

6. Instill sample into aerobic bottle first and then into anaerobic bottle. Do not aspirate air into the anaerobic bottle. Do not add more than 10 mL into each bottle. Gently invert bottles to mix contents.

7. Label each bottle with patient's name and medical record number, type of central line, and indicate location of the line and the lumen color, if desired. Do not place label on neck of bottle or bottom (underneath) of bottle, and do not cover bar code on bottle with the label. Place label vertically on bottle.

**Stability (from collection to initiation):**

- 36 hours at room temperature

**Unacceptable Conditions:**

Samples that are not collected per "Collection Instructions"

**PROCESSING**

**Test Code:**

P061

**Test Group:**

Bacterial culture

**Performing Lab:**

Microbiology

**Specimen Preparation:**

1. If bottles are overfilled, enter OVRFIL (Blood culture appears overfilled; do not put >10ml/bottle.) in SREQ.
2. If actual source (Peripheral Blood, Central Blood) does not match order, complete a credit form and indicate reason BMIS (Specimen source on order/requisition and on bottle received do not match. Test performed and results available under separate order.)
3. Accession the specimen with the test code corresponding to the actual source, and enter MISB (Specimen source on order/requisition and on bottle received do not match. Source listed on bottle used for identification.) in SREQ.
4. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.

**Preferred Volume:**

- Adults: 20 mL total (10 mL for each bottle)
- Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

**Minimum Volume:**

- Adults: 10 mL total (5 mL for each bottle)
- Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

**Unacceptable Conditions:**

Samples that are not collected per "Collection Instructions"

**Stability (from collection to initiation):**

- 36 hours at room temperature

**RESULT INTERPRETATION**

**Reference Interval:**

- No growth

**Critical Values:**

Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned. Additional calls only made if > 7 days have elapsed since first call or a different organism is identified.

**Additional Information:**

Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

**ADMINISTRATIVE**

**CPT Codes:**

87040
Test Code: P061
Test Group: Bacterial culture
Performing Lab: Microbiology
Performed: Daily, all shifts
Methodology: Culture
Remarks:
1. Adults:
   Collect 2 sets of cultures from different sites.
   Collect at least one set of cultures from a peripheral site.

2. Pediatrics:
   Amount of blood depends on weight of patient (see weight based minimums). Anaerobic sample should be sent only in the following circumstances: Outpatients, patients with immunodeficiency, malignancy or after bone or human stem cell transplant, patients with gastrointestinal disorder, or at physician's request due to concern for anaerobes. Sending only an aerobic specimen is sufficient for all other patient populations.

3. Clarify which line(s) to obtain sample from with the provider.

4. Remove plastic cap of each bottle and scrub top of each bottle with 70% alcohol prep pad.


6. Instill sample into aerobic bottle first and then into anaerobic bottle. Do not aspirate air into the anaerobic bottle. Do not add more than 10 mL into each bottle. Gently invert bottles to mix contents.

7. Label each bottle with patient's name and medical record number, type of central line, and indicate location of the line and the lumen color, if desired. Do not place label on neck of bottle or bottom (underneath) of bottle, and do not cover bar code on bottle with the label. Place label vertically on bottle.

Collect:
Paired blood culture bottles (BD BACTEC Plus Aerobic and Lytic Anaerobic bottles)

Amount to Collect:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight:
< 1 kg = 1 mL for aerobic only (0.5 mL for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Sample Type:
Blood

Preferred Volume:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

Minimum Volume:
Adults: 10 mL total (5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 mL for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Unacceptable Conditions:
Samples that are not collected per "Collection Instructions"

**Specimen Preparation:**

1. If bottles are overfilled, enter OVRFIL (Blood culture appears overfilled; do not put >10ml/bottle.) in SREQ.
2. If actual source (Peripheral Blood, Central Blood) does not match order, complete a credit form and indicate reason BMIS (Specimen source on order/requisition and on bottle received do not match. Test performed and results available under separate order.)
3. Accession the specimen with the test code corresponding to the actual source, and enter MISB (Specimen source on order/requisition and on bottle received do not match. Source listed on bottle used for identification.) in SREQ.
4. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.

**Reference Interval:**

No growth

**Critical Values:**

Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned. Additional calls only made if > 7 days have elapsed since first call or a different organism is identified.

**Stability (from collection to initiation):**

36 hours at room temperature

**Reported:**

Up to 6 days

**Reflex Testing:**

If bacteria are detected they are identified and susceptibility testing is performed as appropriate.

**Additional Information:**

Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

**CPT Codes:**

87040
Centromere 10 FISH  
BCEP10, CEP10

ORDERING

Available Stat:  
No

Performing Lab:  
Molecular Genetics - Cytogenetics

Performed:  
Monday - Friday 0900-1700

Methodology:  
FISH

Reported:  
1-2 weeks

Synonyms:  
• CEP 10 FISH

COLLECTION

Sample Type:  
Heparinized whole blood or bone marrow, Bone marrow core biopsy

Collect:  
Dark green top

Amount to Collect:  
Blood: 2 mL  
Bone marrow: 2 mL  
Bone marrow biopsy: 2 cm

Preferred Volume:  
Blood: 2 mL  
Bone marrow: 2 mL  
Bone marrow biopsy: 2 cm

Minimum Volume:  
Blood: 1 mL  
Bone marrow: 1 mL  
Bone marrow biopsy: 1 cm

Remarks:  
Mix sample well with anticoagulant. keep at room temperature

Stability (from collection to initiation):  
Room temperature 2 days

Unacceptable Conditions:  
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:  
BCEP10: Blood  
CEP10: Bone marrow

Performing Lab:  
Molecular Genetics - Cytogenetics

Specimen Preparation:  
Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.

Preferred Volume:  
Blood: 2 mL  
Bone marrow: 2 mL
Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
- Room temperature 2 days

CPT Codes:
- 88271x1, 88275x1

LDT or Modified FDA:
- Yes

Available Stat:
- No

Test Code:
- BCEP10: Blood
- CEP10: Bone marrow

Performing Lab:
- Molecular Genetics - Cytogenetics

Performed:
- Monday - Friday 0900-1700

Methodology:
- FISH

Remarks:
- Mix sample well with anticoagulant. keep at room temperature

Collect:
- Dark green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
- Heparinized whole blood or bone marrow, Bone marrow core biopsy

Preferred Volume:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Specimen Preparation:
- Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.

Synonyms:
- CEP 10 FISH

Stability (from collection to initiation):
- Room temperature 2 days
Reported:
   1-2 weeks
CPT Codes:
   88271x1, 88275x1
LDT or Modified FDA:
   Yes
Centromere 4 FISH
BCEP4, CEP4

ORDERING

Available Stat:
No
Performing Lab:
Molecular Genetics - Cytogenetics
Performed:
Monday - Friday 0900-1700
Methodology:
FISH
Reported:
1-2 weeks
Synonyms:
- CEP 4 FISH

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow, Bone marrow core biopsy
Collect:
Dark green top
Amount to Collect:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm
Preferred Volume:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Blood: 1 mL
Bone marrow: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix sample well with anticoagulant. keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
BCEP4: Blood
CEP4: Bone marrow
Performing Lab:
Molecular Genetics - Cytogenetics
Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.
Preferred Volume:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
- Room temperature 2 days

CPT Codes:
- 88271 x2, 88275x1

LDT or Modified FDA:
- Yes

Available Stat:
- No

Test Code:
- BCEP4: Blood
- CEP4: Bone marrow

Performing Lab:
- Molecular Genetics - Cytogenetics

Performed:
- Monday - Friday 0900-1700

Methodology:
- FISH

Remarks:
- Mix sample well with anticoagulant. keep at room temperature

Collect:
- Dark green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
- Heparinized whole blood or bone marrow, Bone marrow core biopsy

Preferred Volume:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Specimen Preparation:
- Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.

Synonyms:
- CEP 4 FISH

Stability (from collection to initiation):
- Room temperature 2 days
Reported:
1-2 weeks

CPT Codes:
88271 x2, 88275x1

LDT or Modified FDA:
Yes
CEP 11 FISH
BCEP11, CEP11

ORDERING

Performing Lab:
Cytogenetics

Performed:
Mon - Fri 9 am to 5 pm

Methodology:
FISH

Reported:
7~14 days

Synonyms:
• Centromere 11 FISH tests for non-blood samples, Centromere 11 FISH test for Blood samples

COLLECTION

Collect:
Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.

Amount to Collect:
2ml

Minimum Volume:
1ml

Remarks:
Mix well, do not spin, keep at room temperature.

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Leaking, frozen and unlabeled samples.

PROCESSING

Test Code:
BCEP11: Blood
CEP11: Non-blood

Test Group:
Cytogenetics

Performing Lab:
Cytogenetics

Specimen Preparation:
Do not refrigerate or freeze sample, call lab before sample rejection.

Minimum Volume:
1ml

Unacceptable Conditions:
Leaking, frozen and unlabeled samples.

Stability (from collection to initiation):
48 hours

ADMINISTRATIVE

CPT Codes:
88271x1, 88275x1

Printed 06/07/19
Test information subject to change
<table>
<thead>
<tr>
<th><strong>LDT or Modified FDA:</strong></th>
<th>Yes</th>
</tr>
</thead>
</table>

### COMPLETE VIEW

| **Test Code:** | BCEP11: Blood  
CEP11: Non-blood |
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Test Group:</strong></td>
<td>Cytogenetics</td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Cytogenetics</td>
</tr>
<tr>
<td><strong>Performed:</strong></td>
<td>Mon - Fri 9 am to 5 pm</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>FISH</td>
</tr>
<tr>
<td><strong>Remarks:</strong></td>
<td>Mix well, do not spin, keep at room temperature.</td>
</tr>
<tr>
<td><strong>Collect:</strong></td>
<td>Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.</td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
<td>2ml</td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
<td>1ml</td>
</tr>
<tr>
<td><strong>Unacceptable Conditions:</strong></td>
<td>Leaking, frozen and unlabeled samples.</td>
</tr>
<tr>
<td><strong>Specimen Preparation:</strong></td>
<td>Do not refrigerate or freeze sample, call lab before sample rejection.</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>• Centromere 11 FISH tests for non-blood samples, Centromere 11 FISH test for Blood samples</td>
</tr>
<tr>
<td><strong>Stability (from collection to initiation):</strong></td>
<td>48 hours</td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
<td>7~14 days</td>
</tr>
<tr>
<td><strong>CPT Codes:</strong></td>
<td>88271x1, 88275x1</td>
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<td><strong>LDT or Modified FDA:</strong></td>
<td>Yes</td>
</tr>
</tbody>
</table>
CEP 3 FISH
BCEP3, CEP3

ORDERING

Performing Lab: Cytogenetics
Performed: Mon - Fri 9 am to 5 pm
Methodology: FISH
Reported: 7–14 days
Synonyms:
  • Centromere 3 FISH test

COLLECTION

Sample Type: Dark Green top Sodium Heparin tube for Bone marrow
Collect: Dark Green top Sodium Heparin tube for bone marrow, Sterile container with medium for bone core.
Amount to Collect: 2ml
Preferred Volume: 2ml
Minimum Volume: 1ml
Remarks:
  Mix well, do not spin, keep at room temperature.
Stability (from collection to initiation): 48 hours
Unacceptable Conditions: Leaking, frozen sample, unlabeled sample

PROCESSING

Test Code:
  BCEP3: Blood
  CEP3: Non-blood
Test Group: Cytogenetics
Performing Lab: Cytogenetics
Specimen Preparation:
  Do not refrigerate or freeze sample, call lab before rejection of sample
Preferred Volume: 2ml
Minimum Volume: 1ml
Unacceptable Conditions:
  Leaking, frozen sample, unlabeled sample
Stability (from collection to initiation): 48 hours
**ADMINISTRATIVE**

CPT Codes:
- 88271x1, 88275x1

LDT or Modified FDA:
- Yes

**COMPLETE VIEW**

Test Code:
- BCEP3: Blood
- CEP3: Non-blood

Test Group:
- Cytogenetics

Performing Lab:
- Cytogenetics

Performed:
- Mon - Fri 9 am to 5 pm

Methodology:
- FISH

Remarks:
- Mix well, do not spin, keep at room temperature.

Collect:
- Dark Green top Sodium Heparin tube for bone marrow, Sterile container with medium for bone core.

Amount to Collect:
- 2ml

Sample Type:
- Dark Green top Sodium Heparin tube for Bone marrow

Preferred Volume:
- 2ml

Minimum Volume:
- 1ml

Unacceptable Conditions:
- Leaking, frozen sample, unlabeled sample

Specimen Preparation:
- Do not refrigerate or freeze sample, call lab before rejection of sample

Synonyms:
- Centromere 3 FISH test

Stability (from collection to initiation):
- 48 hours

Reported:
- 7~14 days

CPT Codes:
- 88271x1, 88275x1

LDT or Modified FDA:
- Yes
**ORDERING**

Performing Lab:  
Cytogenetics

Performed:  
Mon-Fri 9 am to 5 pm

Methodology:  
FISH

Reported:  
7~14 days

Synonyms:  
- Centromere 7 FISH test

**COLLECTION**

Sample Type:  
Dark Green top Sodium Heparin

Collect:  
Dark Green top Sodium Heparin tube for bone marrow, Sterile container with medium for bone core

Amount to Collect:  
2ml

Preferred Volume:  
2ml

Minimum Volume:  
1ml

Remarks:  
Mix well, do not spin, keep at room temperature

Stability (from collection to initiation):  
48 hours

Unacceptable Conditions:  
Leaking, frozen samples, unlabeled samples

**PROCESSING**

Test Code:  
BCEP7: Blood  
CEP7: Non-blood

Test Group:  
Cytogenetics

Performing Lab:  
Cytogenetics

Specimen Preparation:  
Do not refrigerate or freeze sample, call lab before sample rejection

Preferred Volume:  
2ml

Minimum Volume:  
1ml

Unacceptable Conditions:  
Leaking, frozen samples, unlabeled samples

Stability (from collection to initiation):  
48 hours
**ADMINISTRATIVE**

**CPT Codes:**

- 88271x1, 88275x1

**LDT or Modified FDA:**

- yes

**COMPLETE VIEW**

**Test Code:**

- BCEP7: Blood
- CEP7: Non-blood

**Test Group:**

- Cytogenetics

**Performing Lab:**

- Cytogenetics

**Performed:**

- Mon-Fri 9 am to 5 pm

**Methodology:**

- FISH

**Remarks:**

- Mix well, do not spin, keep at room temperature

**Collect:**

- Dark Green top Sodium Heparin tube for bone marrow, Sterile container with medium for bone core

**Amount to Collect:**

- 2ml

**Sample Type:**

- Dark Green top Sodium Heparin

**Preferred Volume:**

- 2ml

**Minimum Volume:**

- 1ml

**Unacceptable Conditions:**

- Leaking, frozen samples, unlabeled samples

**Specimen Preparation:**

- Do not refrigerate or freeze sample, call lab before sample rejection

**Synonyms:**

- Centromere 7 FISH test

**Stability (from collection to initiation):**

- 48 hours

**Reported:**

- 7-14 days

**CPT Codes:**

- 88271x1, 88275x1

**LDT or Modified FDA:**

- yes
Ceroid Lipofuscinosis

ORDERING

Available Stat: No
Performing Lab: Anatomic pathology
Methodology: Electron Microscopy

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 15-20 mL blood
Preferred Volume: 15-20 mL blood
Minimum Volume: 5 mL blood
Remarks: Label tube with patient's name and medical record number. Complete a Surgical pathology consultation request and deliver asap (must be received before noon) to the Electron Microscopy Lab, room S-570 (415-353-2673)
Unacceptable Conditions: Samples received after 1130.

PROCESSING

Performing Lab: Anatomic pathology
Preferred Volume: 15-20 mL blood
Minimum Volume: 5 mL blood
Unacceptable Conditions: Samples received after 1130.

ADMINISTRATIVE

CPT Codes: 88348

COMPLETE VIEW

Available Stat: No
Performing Lab: Anatomic pathology
Methodology: Electron Microscopy
Remarks:
Label tube with patient's name and medical record number. Complete a Surgical pathology consultation request and deliver asap (must be received before noon) to the Electron Microscopy Lab, room S-570 (415-353-2673)

Collect:
Lavender top

Amount to Collect:
15-20 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
15-20 mL blood

Minimum Volume:
5 mL blood

Unacceptable Conditions:
Samples received after 1130.

CPT Codes:
88348
**Ceruloplasmin**

**CERU**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday, Wednesday, Friday (day shift)

**Methodology:**
- Rate nephelometry

**Reported:**
- 2-5 days

**Additional Information:**
- Levels are very low in 80% of patients with Wilson's disease and low-intermediate in 20% of carriers. The test is not diagnostic in infants < 6 months old, who normally have low levels. Lipemia interferes with the assay.

**Synonyms:**
- Ferroxidase

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### PROCESSING

**Test Code:**
- CERU

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Refrigerate serum

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### RESULT INTERPRETATION

*Test information subject to change*
### Units:
- mg/dL

### Reference Interval:
- 19-68 mg/dL

### Additional Information:
Levels are very low in 80% of patients with Wilson's disease and low-intermediate in 20% of carriers. The test is not diagnostic in infants < 6 months old, who normally have low levels. Lipemia interferes with the assay.

### ADMINISTRATIVE

| CPT Codes: | 82390 |
| LOINC Codes: | 2064-4 |

### COMPLETE VIEW

| Available Stat: | No |
| Test Code: | CERU |
| Performing Lab: | Immunology |
| Performed: | Monday, Wednesday, Friday (day shift) |
| Methodology: | Rate nephelometry |
| Collect: | Gold top |
| Amount to Collect: | 1 mL blood |
| Sample Type: | Serum |
| Preferred Volume: | 0.5 mL serum |
| Minimum Volume: | 0.3 mL serum |
| Unacceptable Conditions: | Lipemic samples |
| Specimen Preparation: | Refrigerate serum |

### Units:
- mg/dL

### Reference Interval:
- 19-68 mg/dL

### Synonyms:
- Ferroxidase

### Reported:
- 2-5 days

### Additional Information:
Levels are very low in 80% of patients with Wilson's disease and low-intermediate in 20% of carriers. The test is not diagnostic in infants < 6 months old, who normally have low levels. Lipemia interferes with the assay.

### CPT Codes:
- 82390

### LOINC Codes:
Chemistry Special Study
SPCHEM

ORDERING

Performing Lab:
China Basin Chemistry

Additional Information:
This procedure is primarily ordered so the laboratory can obtain an additional blood sample to internally check the validity of a previously reported result (e.g., by repeat testing, parallel dilution testing, etc). There is no charge to the patient when this procedure is ordered. The findings are reported by sending a free text comment to the patient medical record.

COLLECTION

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
5 mL blood

Preferred Volume:
3 mL serum

Minimum Volume:
1 mL serum

PROCESSING

Test Code:
SPCHEM

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Centrifuge sample and aliquot all serum. Store tightly capped at 2-8C. Ship to China Basin Chemistry.

Preferred Volume:
3 mL serum

Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Additional Information:
This procedure is primarily ordered so the laboratory can obtain an additional blood sample to internally check the validity of a previously reported result (e.g., by repeat testing, parallel dilution testing, etc). There is no charge to the patient when this procedure is ordered. The findings are reported by sending a free text comment to the patient medical record.

COMPLETE VIEW

Test Code:
SPCHEM

Performing Lab:
China Basin Chemistry

Collect:
Gold top or Red top

Amount to Collect:
5 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
3 mL serum

**Minimum Volume:**
1 mL serum

**Specimen Preparation:**
Centrifuge sample and aliquot all serum. Store tightly capped at 2-8°C. Ship to China Basin Chemistry.

**Additional Information:**
This procedure is primarily ordered so the laboratory can obtain an additional blood sample to internally check the validity of a previously reported result (e.g., by repeat testing, parallel dilution testing, etc). There is no charge to the patient when this procedure is ordered. The findings are reported by sending a free text comment to the patient medical record.
Chikungunya Antibody Screen
CHIKA

ORDERING

Available Stat: 
No
Performing Lab: 
Focus via Quest
Methodology: 
Immunoassay
Additional Information:
Chikungunya virus is a mosquito-borne alphavirus associated with febrile illness in Africa, the Indian Ocean islands, India, Southeast Asia, and the Caribbean.

Symptoms include severe arthralgia, rash, and headache. U.S. cases have been associated with international travel to countries with endemic Chikungunya virus.

Detection of Chikungunya virus antibodies is a reliable indicator of Chikungunya virus infection. IgM detection suggests infection within the previous 3 months.

Reflex Testing:
If Chikungunya IgG Screen is Positive, Chikungunya IgG Titration will be performed at an additional charge (CPT code(s): 86790).

If Chikungunya IgM Screen is Positive, Chikungunya IgM Titration will be performed at an additional charge (CPT code(s): 86790).

COLLECTION

Sample Type: 
Serum
Collect: 
Red top or Gold top
Amount to Collect: 
1 mL blood
Preferred Volume: 
0.5 mL serum
Minimum Volume: 
0.1 mL serum
Stability (from collection to initiation): 
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

PROCESSING

Test Code: 
CHIKA
Sendout: 
Yes
Performing Lab: 
Focus via Quest
Specimen Preparation: 
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 70188X
Preferred Volume: 
0.5 mL serum
Minimum Volume: 
0.1 mL serum
Stability (from collection to initiation): 
Printed 06/07/19
Test information subject to change
Additional Information:

Chikungunya virus is a mosquito-borne alphavirus associated with febrile illness in Africa, the Indian Ocean islands, India, Southeast Asia, and the Caribbean.

Symptoms include severe arthralgia, rash, and headache. U.S. cases have been associated with international travel to countries with endemic Chikungunya virus.

Detection of Chikungunya virus antibodies is a reliable indicator of Chikungunya virus infection. IgM detection suggests infection within the previous 3 months.

CPT Codes:

86790-90 x2

LOINC Codes:

56129-0, 56131-6

Available Stat:
No

Test Code:
CHIKA

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immonoassay

Collect:
Red top or Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 70188X

Stability (from collection to initiation):
Room temperaquire 1 week, refrigerated 2 weeks, frozen 1 month

Reflex Testing:
If Chikungunya IgG Screen is Positive, Chikungunya IgG Titration will be performed at an additional charge (CPT code(s): 86790).

If Chikungunya IgM Screen is Positive, Chikungunya IgM Titration will be performed at an additional charge (CPT code(s): 86790).

Additional Information:

Chikungunya virus is a mosquito-borne alphavirus associated with febrile illness in Africa, the Indian Ocean islands, India, Southeast Asia, and the Caribbean.

Symptoms include severe arthralgia, rash, and headache. U.S. cases have been associated with international travel to countries with endemic Chikungunya virus.
Detection of Chikungunya virus antibodies is a reliable indicator of Chikungunya virus infection. IgM detection suggests infection within the previous 3 months.

**CPT Codes:**
86790-90 x2

**LOINC Codes:**
56129-0, 56131-6
Chimerism Testing - CD14/15 Cell Subset
HTNH14 (Sunquest: ILNH14)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
STR

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Synonyms:
- Post-Transplant Testing by STR - Myeloid Lineage

COLLECTION

Sample Type:
ACD anticoagulated whole blood or bone marrow

Collect:
Yellow top (ACD)
Adult: 8.5 mL size x2
Pediatric: 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult: 17 mL blood or marrow
Pediatric: 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Preferred Volume:
Adult: 17 mL blood or marrow
Pediatric: 8.5 mL blood or marrow (see minimum volume information)

Minimum Volume:
Adult: 8.5 mL blood or marrow
Pediatric: 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
WBC count too low (<1,000)
PROCESSING

Test Code:
HTNH14 (Sunquest: ILNH14)

Test Group:
Chimerism Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
Adult: 17 mL blood or marrow
Pediatric: 8.5 mL blood or marrow (see minimum volume information)

*If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult: 8.5 mL blood or marrow
Pediatric: 3 mL blood or marrow

*Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81268

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTNH14 (Sunquest: ILNH14)

Test Group:
Chimerism Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
STR

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

*Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
- Yellow top (ACD)
  - Adult: 8.5 mL size x2
  - Pediatric: 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
- Adult: 17 mL blood or marrow
- Pediatric: 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
- ACD anticoagulated whole blood or bone marrow

Preferred Volume:
- Adult: 17 mL blood or marrow
- Pediatric: 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
- Adult: 8.5 mL blood or marrow
- Pediatric: 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
- WBC count too low (<1,000)

Specimen Preparation:
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Post-Transplant Testing by STR - Myeloid Lineage

Stability (from collection to initiation):
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
- 81268
Chimerism Testing - CD19 Cell Subset
HTNH19 (Sunquest: ILNH19)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
STR
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
- Post-Transplant Testing by STR - B Cells Subset

COLLECTION

Sample Type:
ACD anticoagulated whole blood or bone marrow
Collect:
- Yellow top (ACD)
  - Adult 8.5 mL size x2
  - Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
- Adult 17 mL blood or marrow
  - Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
- Adult 17 mL blood or marrow
  - Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
- Adult 8.5 mL blood or marrow
  - Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
WBC count too low (<1,000)
### PROCESSING

**Test Code:**
HTNH19 (Sunquest: ILNH19)

**Test Group:**
Chimerism Testing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

**Note:** Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

### ADMINISTRATIVE

**CPT Codes:**
81268

### COMPLETE VIEW

**Available Stat:**
Yes

**Test Code:**
HTNH19 (Sunquest: ILNH19)

**Test Group:**
Chimerism Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
STR

**Remarks:**
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

**Note:** Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

[SAMPLE COLLECTION GUIDE FOR ITL TESTS](#)
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

**Collect:**
- Yellow top (ACD)
  - Adult 8.5 mL size x2
  - Pediatric 3 mL x1 acceptable (see minimum volume information)

**Amount to Collect:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Sample Type:**
- ACD anticoagulated whole blood or bone marrow

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Post-Transplant Testing by STR - B Cells Subset

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**CPT Codes:**
- 81268
Chimerism Testing - CD3 Cell Subset
HTNH3 (Sunquest: ILNH3)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
STR

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Synonyms:
• Post-Transplant Testing by STR - T Cells Subset

COLLECTION

Sample Type:
ACD anticoagulated whole blood or bone marrow

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
WBC count too low (<1,000)
**PROCESSING**

**Test Code:**
HTNH3 (Sunquest: ILNH3)

**Test Group:**
Chimerism Testing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

*Note:* Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**ADMINISTRATIVE**

**CPT Codes:**
81268

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTNH3 (Sunquest: ILNH3)

**Test Group:**
Chimerism Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
STR

**Remarks:**
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

*Note:* Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
ACD anticoagulated whole blood or bone marrow

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
• Post-Transplant Testing by STR - T Cells Subset

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81268
Chimerism Testing - CD33 Cell Subset
HTNH33 (Sunquest: ILNH33)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: STR
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms: Post-Transplant Testing by STR - Myeloid Lineage

COLLECTION

Sample Type: ACD anticoagulated whole blood or bone marrow
Collect:
- Yellow top (ACD)
- Adult 8.5 mL size x2
- Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)
  If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow
  If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow
  Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
- Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.
  Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
- WBC count too low (<1,000)
**PROCESSING**

**Test Code:**
HTNH33 (Sunquest: ILNH33)

**Test Group:**
Chimerism Testing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

*Note:* Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**ADMINISTRATIVE**

**CPT Codes:**
- 81268

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTNH33 (Sunquest: ILNH33)

**Test Group:**
Chimerism Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
STR

**Remarks:**
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

*Note:* Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
ACD anticoagulated whole blood or bone marrow

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Post-Transplant Testing by STR - Myeloid Lineage

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81268
Chimerism Testing - CD34 Cell Subset
HTNH34 (Sunquest: ILNH34)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
STR

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Synonyms:
- Post-Transplant Testing by STR - Early Haematopoietic Cells

COLLECTION

Sample Type:
ACD anticoagulated whole blood or bone marrow

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
WBC count too low (<1,000)
PROCESSING

Test Code:
HTNH34 (Sunquest: ILNH34)

Test Group:
Chimerism Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81268

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTNH34 (Sunquest: ILNH34)

Test Group:
Chimerism Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
STR

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x 1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
ACD anticoagulated whole blood or bone marrow

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Post-Transplant Testing by STR - Early Haematopoietic Cells

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81268

Printed 06/07/19
Test information subject to change
Chimerism Testing - CD56 Cell Subset
HTNH56 (Sunquest: ILNH56)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: STR
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
- Post-Transplant Testing by STR - NK Cells Subset

COLLECTION

Sample Type: ACD anticoagulated whole blood or bone marrow
Collect:
- Yellow top (ACD)
- Adult 8.5 mL size x2
- Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
- Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.
Stability (from collection to initiation):
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.
Unacceptable Conditions:
- WBC count too low (<1,000)
PROCESSING

Test Code:
HTNH56 (Sunquest: ILNH56)
Test Group:
Chimerism Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Unacceptable Conditions:
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81268

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTNH56 (Sunquest: ILNH56)
Test Group:
Chimerism Testing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
STR
Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
- Yellow top (ACD)
  - Adult 8.5 mL size x2
  - Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
- ACD anticoagulated whole blood or bone marrow

Preferred Volume:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
- WBC count too low (<1,000)

Specimen Preparation:
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Post-Transplant Testing by STR - NK Cells Subset

Stability (from collection to initiation):
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
- 81268
Chimerism Testing - CD71 Cell Subset
HTNH71 (Sunquest: ILNH71)

ORDERING

Available Stat:
Yes
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
   STR
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
   • Post-Transplant Testing by STR - Early Erythroid Cells

COLLECTION

Sample Type:
   ACD anticoagulated whole blood or bone marrow
Collect:
   Yellow top (ACD)
   Adult 8.5 mL size x2
   Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
   Adult 17 mL blood or marrow
   Pediatric 8.5 mL blood or marrow (see minimum volume information)
If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
   Adult 17 mL blood or marrow
   Pediatric 8.5 mL blood or marrow
If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
   Adult 8.5 mL blood or marrow
   Pediatric 3 mL blood or marrow
   Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
   Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.
   Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.
Unacceptable Conditions:
   WBC count too low (<1,000)
PROCESSING

Test Code:
HTNH71 (Sunquest: ILNH71)

Test Group:
Chimerism Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81268

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTNH71 (Sunquest: ILNH71)

Test Group:
Chimerism Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
STR

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387

**Note:** Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

**Collect:**
- Yellow top (ACD)
- Adult 8.5 mL size x2
- Pediatric 3 mL x1 acceptable (see minimum volume information)

**Amount to Collect:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Sample Type:**
- ACD anticoagulated whole blood or bone marrow

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

**Note:** Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Post-Transplant Testing by STR - Early Erythroid Cells

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**CPT Codes:**
- 81268

Printed 06/07/19
Test information subject to change
Chimerism Testing - Granulocyte Cells Subset
HTNHGR (Sunquest: ILNHGR)

ORDERING

Available Stat:
Yes
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
   STR
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
   - Post-Transplant Testing by STR - Granulocyte Cells Subset

COLLECTION

Sample Type:
   ACD anticoagulated whole blood or bone marrow
Collect:
   Yellow top (ACD)
   Adult 8.5 mL size x2
   Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
   Adult 17 mL blood or marrow
   Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
   Adult 17 mL blood or marrow
   Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
   Adult 8.5 mL blood or marrow
   Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
   Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Unacceptable Conditions:
   WBC count too low (<1,000)
PROCESSING

Test Code:
  HTNHGR (Sunquest: ILNHGR)
Test Group:
  Chimerism Testing
Sendout:
  Yes
Performing Lab:
  Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
  Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
  Adult 17 mL blood or marrow
  Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
  Adult 8.5 mL blood or marrow
  Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Unacceptable Conditions:
  WBC count too low (<1,000)
Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
  81268

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  HTNHGR (Sunquest: ILNHGR)
Test Group:
  Chimerism Testing
Performing Lab:
  Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
  Yes
Methodology:
  STR
Remarks:
  Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387

**Note:** Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

**Collect:**
- Yellow top (ACD)
- Adult 8.5 mL size x2
- Pediatric 3 mL x1 acceptable (see minimum volume information)

**Amount to Collect:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Sample Type:**
- ACD anticoagulated whole blood or bone marrow

**Preferred Volume:**
- Adult 17 mL blood or marrow
- Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Minimum Volume:**
- Adult 8.5 mL blood or marrow
- Pediatric 3 mL blood or marrow

**Note:** Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Post-Transplant Testing by STR - Granulocyte Cells Subset

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**CPT Codes:**
- 81268
Chimerism Testing - Informatives (Recipient and Donor)
HTN1 (Sunquest: ILNH1)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: STR
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
  • Pre-Transplant Testing by STR

COLLECTION

Sample Type:
  ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect:
  Yellow top (ACD)
  Adult 8.5 mL size x2
  Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
  Adult 17 mL blood or marrow
  Pediatric 8.5 mL blood or marrow (see minimum volume information)
If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
  8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
  1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:
  Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.
  Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.
Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.
Unacceptable Conditions:
  WBC count too low (<1,000)

PROCESSING

Test Code:
  HTN1 (Sunquest: ILNH1)
Test Group:
Chimerism Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81265

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTNH1 (Sunquest: ILNH1)

Test Group:
Chimerism Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
STR

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)
If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
- WBC count too low (<1,000)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Pre-Transplant Testing by STR

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**CPT Codes:**
- 81265
Chimerism Testing - Whole Blood or Bone Marrow
HTNH2 (Sunquest: ILNH2)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
STR
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms:
• Post-Transplant Testing by STR

COLLECTION

Sample Type:
ACD anticoagulated whole blood or bone marrow
Collect:
Yellow top (ACD)
Adult 8.5 mL size x2
Pediatric 3 mL x1 acceptable (see minimum volume information)
Amount to Collect:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.
Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.
Unacceptable Conditions:
WBC count too low (<1,000)
PROCESSING

Test Code:
HTNH2 (Sunquest: ILNH2)

Test Group:
Chimerism Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
Adult 17 mL blood or marrow
Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
Adult 8.5 mL blood or marrow
Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

ADMINISTRATIVE

CPT Codes:
81267

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTNH2 (Sunquest: ILNH2)

Test Group:
Chimerism Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
STR

Remarks:
Fill ACD tubes completely. Obtain ACD tube from Specimen Receiving. If collected with other chimerism tests and blood count is low, collect 2 yellow top tubes.

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.
ITL (415) 476-3387

Note: Because of limited stability, samples should be collected Monday through Thursday avoiding holidays. If samples are collected Friday they must be delivered to the UCSF Clinical Laboratory by 12:00 noon.

Collect:
  Yellow top (ACD)
  Adult 8.5 mL size x2
  Pediatric 3 mL x1 acceptable (see minimum volume information)

Amount to Collect:
  Adult 17 mL blood or marrow
  Pediatric 8.5 mL blood or marrow (see minimum volume information)

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Sample Type:
  ACD anticoagulated whole blood or bone marrow

Preferred Volume:
  Adult 17 mL blood or marrow
  Pediatric 8.5 mL blood or marrow

If these volumes are problematic please contact ITL at 6-3887 to discuss test needs and sample requirements.

Minimum Volume:
  Adult 8.5 mL blood or marrow
  Pediatric 3 mL blood or marrow

Note: Assuming a normal leukocyte count the 3 mL minimum sample size is only sufficient for a single study, multiple subsets will require additional sample. Please contact ITL at 6-3887 to discuss.

Unacceptable Conditions:
  WBC count too low (<1,000)

Specimen Preparation:
  Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
  • Post-Transplant Testing by STR

Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 48 hours. For additional information, call 476-3887.

Reported:
  Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
  81267
Chlamydia Antibody (MIF)
CPNI, TWAR, CTRI, CPSI

ORDERING

Available Stat: No
Performing Lab: Focus Diagnostics via Quest
Methodology: Micro-immunofluorescence assay (MIF)
Reported: Test run 6x per week. Turnaround time 5-6 days.
Additional Information: IgG, IgA and IgM antibody tests are performed for each organism requested.

The immunofluorescent antibody test is more sensitive than CF and is the best serologic test for diagnosing chlamydial infection, although seroconversion may be delayed, as with the CF test. Due to the prolonged incubation period often seen in acute disease, the usual criterion for acute infection of a 4 fold rise in titer may not be demonstrable.

In patients infected with C. pneumoniae (TWAR), 70% of whom develop IF antibody (compared with 50% for CF) a single IgM titer > 32 or an IgG titer > 512 suggests acute infection.

Because antibody persists from prior exposures, levels (even of IgM) are often unhelpful in the diagnosis of urethritis or cervicitis in adults, although very high titers suggest invasive disease, e.g., salpingitis, epididymitis or proctitis. Transplacental passage of maternal antibody may interfere with serodiagnosis of acute infection in infants.

Synonyms:
- LGV
- Parrot fever
- Psittacosis
- congenital infection
- prenatal infection

COLLECTION

Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum
Remarks: Request MUST specify the single organism sought
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

PROCESSING

Test Code: CPNI (C. pneumoniae (TWAR)), CTRI (C. trachomatis), CPSI (C. psittaci)
Test Group:
Chlamydia

Sendout:
Yes

Performing Lab:
Focus Diagnostics via Quest

Specimen Preparation:
Refrigerate sample. Enter the appropriate test code for the organism requested:
- CPNI: Chlamydia pneumoniae
- CTRI: Chlamydia trachomatis
- CPSI: Chlamydia psittaci

Preferred Volume:
1 mL serum

Minimum Volume:
0.25 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

RESULT INTERPRETATION

Units:
Titer

Reference Interval:
- IgG: <1:64
- IgA: <1:16
- IgM: <1:10

Additional Information:
IgG, IgA and IgM antibody tests are performed for each organism requested.

The immunofluorescent antibody test is more sensitive than CF and is the best serologic test for diagnosing chlamydial infection, although seroconversion may be delayed, as with the CF test. Due to the prolonged incubation period often seen in acute disease, the usual criterion for acute infection of a 4 fold rise in titer may not be demonstrable.

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Because antibody persists from prior exposures, levels (even of IgM) are often unhelpful in the diagnosis of urethritis or cervicitis in adults, although very high titers suggest invasive disease, e.g., salpingitis, epididymitis or proctitis. Transplacental passage of maternal antibody may interfere with serodiagnosis of acute infection in infants.

ADMINISTRATIVE

CPT Codes:
86632-90, 86631-90 x2 for each organism tested.

COMPLETE VIEW

Available Stat:
No

Test Code:
- CPNI (C. pneumoniae (TWAR)), CTRI (C. trachomatis), CPSI (C. psittaci)

Test Group:
Chlamydia

Performing Lab:
Focus Diagnostics via Quest

Sendout:
Yes

**Methodology:**
Micro-immunofluorescence assay (MIF)

**Remarks:**
Request **MUST** specify the single organism sought

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.25 mL serum

**Specimen Preparation:**
Refrigerate sample. Enter the appropriate test code for the organism requested:

- CPNI: Chlamydia pneumoniae
- CTRI: Chlamydia trachomatis
- CPSI: Chlamydia psittaci

**Units:**
Titer

**Reference Interval:**
- IgG: <1:64
- IgA: <1:16
- IgM: <1:10

**Synonyms:**
- LGV
- Parrot fever
- Psittacosis
- congenital infection
- prenatal infection

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

**Reported:**
Test run 6x per week. Turnaround time 5-6 days.

**Additional Information:**
IgG, IgA and IgM antibody tests are performed for each organism requested.

The immunofluorescent antibody test is more sensitive than CF and is the best serologic test for diagnosing chlamydial infection, although seroconversion may be delayed, as with the CF test. Due to the prolonged incubation period often seen in acute disease, the usual criterion for acute infection of a 4 fold rise in titer may not be demonstrable.

In patients infected with C. pneumoniae (TWAR), 70% of whom develop IF antibody (compared with 50% for CF) a single IgM titer > 32 or an IgG titer > 512 suggests acute infection.

Because antibody persists from prior exposures, levels (even of IgM) are often unhelpful in the diagnosis of urethritis or cervicitis in adults, although very high titers suggest invasive disease, e.g., salpingitis, epididimitis or proctitis. Transplacental passage of maternal antibody may interfere with serodiagnosis of acute infection in infants.

**CPT Codes:**
86632-90, 86631-90 x2 for each organism tested.
Chlamydia Culture
P699

ORDERING

Available Stat:
No
Performing Lab:
Focus Diagnostics
Methodology:
Tissue Culture, IFA
Reported:
3-7 days.
Additional Information:
Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Chlamydia trachomatis can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

Chlamydia trachomatis is identified through the use of monoclonal antibodies specific for the major outer membrane protein present in all 15 known serovars of C. trachomatis but not C. pneumoniae or C. psittaci. Contact Microbiology if testing for the latter two species are clinically indicated. Substances that may interfere with growth or isolation of Chlamydia include antibiotics administered to the patient prior to specimen collection.

Synonyms:
- C. pneumoniae
- C. psittaci
- C. trachomatis
- TWAR agent
- Inclusion conjunctivitis
- Trachoma
- TRIC
- congenital infection
- prenatal infection

COLLECTION

Patient Preparation:
Some spermicidal agents and feminine powder sprays interfere with Chlamydia testing and should not be used prior to specimen collection.

Sample Type:
Endocervical swab, urethral swab, conjunctival eye scraping (swab), rectal swab, lymph node aspirate/biopsy, biopsy, vaginal swab (<12 years old), nasopharyngeal swab (infants only), throat swab, and endotracheal aspirate (infants only)

Collect:
Swabs and tissue: Universal Transport Medium (UTM)
Other specimens: Sterile container

Amount to Collect:
Swab samples: One swab
Fluids: 3 mL
Tissue: 1 cu mm

Preferred Volume:
Swab samples: One swab
Fluids: 3 mL
Tissue: 1 cu mm

Minimum Volume:
Swab samples: One swab
Fluids: 1 mL
?Tissue: 1 cu mm

Remarks:
Do not use wood swabs. Dacron or rayon on plastic or wire swabs are recommended for specimen collection. Specimen should contain columnar or cuboidal epithelial cells from the infected site.

Collection kits with Universal Transport Medium (UTM) can be obtained from Moffit-Long Laboratory or Mount Zion Laboratory. Break or bend swabs to fit inside UTM tube. Immerse biopsy in UTM tube

Unacceptable Conditions:
Collected with wooden handle swab

PROCESSING

Test Code:
P699
Test Group:
Chlamydia
Sendout:
Yes
Performing Lab:
Focus Diagnostics
Specimen Preparation:
If fluid, transfer 3 ml to UTM media or 1 part fluid to 1 part UTM media. Transport specimens in UTM to China Basin using cold packs. Freeze specimen at -70°C upon receipt at China Basin, and ship frozen to reference lab. Focus test code 690.
Preferred Volume:
Swab samples: One swab
Fluids: 3 mL
?Tissue: 1 cu mm
Minimum Volume:
Swab samples: One swab
Fluids: 1 mL
?Tissue: 1 cu mm
Unacceptable Conditions:
Collected with wooden handle swab

RESULT INTERPRETATION

Reference Interval:
No Chlamydia isolated
Additional Information:
Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Chlamydia trachomatis can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

Chlamydia trachomatis is identified through the use of monoclonal antibodies specific for the major outer membrane protein present in all 15 known serovars of C. trachomatis but not C. pneumoniae or C. psittaci. Contact Microbiology if testing for the latter two species are clinically indicated. Substances that may interfere with growth or isolation of Chlamydia include antibiotics administered to the patient prior to specimen collection.

ADMINISTRATIVE

CPT Codes:
87110-90, 87140-90
LOINC Codes:
560-3
**Available Stat:**
No

**Test Code:**
P699

**Test Group:**
Chlamydia

**Performing Lab:**
Focus Diagnostics

**Sendout:**
Yes

**Methodology:**
Tissue Culture, IFA

**Patient Preparation:**
Some spermicidal agents and feminine powder sprays interfere with Chlamydia testing and should not be used prior to specimen collection.

**Remarks:**
Do not use wood swabs. Dacron or rayon on plastic or wire swabs are recommended for specimen collection. Specimen should contain columnar or cuboidal epithelial cells from the infected site.

Collection kits with Universal Transport Medium (UTM) can be obtained from Moffit-Long Laboratory or Mount Zion Laboratory. Break or bend swabs to fit inside UTM tube. Immerse biopsy in UTM tube.

**Collect:**
- Swabs and tissue: Universal Transport Medium (UTM)
- Other specimens: Sterile container

**Amount to Collect:**
- Swab samples: One swab
- Fluids: 3 mL
- Tissue: 1 cu mm

**Sample Type:**
- Endocervical swab, urethral swab, conjunctival eye scraping (swab), rectal swab, lymph node aspirate/biopsy, biopsy, vaginal swab (<12 years old), nasopharyngeal swab (infants only), throat swab, and endotracheal aspirate (infants only)

**Preferred Volume:**
- Swab samples: One swab
- Fluids: 3 mL
- Tissue: 1 cu mm

**Minimum Volume:**
- Swab samples: One swab
- Fluids: 1 mL
- Tissue: 1 cu mm

**Unacceptable Conditions:**
- Collected with wooden handle swab

**Specimen Preparation:**
If fluid, transfer 3 ml to UTM media or 1 part fluid to 1 part UTM media. Transport specimens in UTM to China Basin using cold packs. Freeze specimen at -70C upon receipt at China Basin, and ship frozen to reference lab. Focus test code 690.

**Reference Interval:**
No Chlamydia isolated

**Synonyms:**
- C. pneumoniae
- C. psittaci
- C. trachomatis
- TWAR agent
- Inclusion conjunctivitis
- Trachoma
- TRIC
- congenital infection
- prenatal infection

**Reported:**
3-7 days.

**Additional Information:**
Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Chlamydia trachomatis can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

Chlamydia trachomatis is identified through the use of monoclonal antibodies specific for the major outer membrane protein present in all 15 known serovars of C. trachomatis but not C. pneumoniae or C. psittaci. Contact Microbiology if testing for the latter two species are clinically indicated. Substances that may interfere with growth or isolation of Chlamydia include antibiotics administered to the patient prior to specimen collection.

**CPT Codes:**
87110-90, 87140-90

**LOINC Codes:**
560-3
Chlamydia trachomatis / Neisseria gonorrhoeae RNA

ORDERING

Ordering Recommendations:
This assay is not intended for the evaluation of suspected sexual abuse or for other medico-legal indications.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Test performed Monday - Friday

Methodology:
Target capture, transcription mediated amplification, and dual kinetic assay technologies.

Reported:
1 - 4 days

Synonyms:
• STD, Sexually transmitted disease
• GC
• Gonorrhoeae
• N gonorrhoeae
• CT/GC RNA

COLLECTION

Sample Type:
Endocervical swab, male urethral swab, rectal swab, throat swab, vaginal swab or first-void urine, conjunctival swab

Collect:
Endocervical, male urethral, rectal, throat, and conjunctival: Gen-Probe Aptima Unisex swab collection kit
Vaginal: Gen-Probe Aptima vaginal/multitest swab collection kit
Urine: Urine cup

Amount to Collect:
Swab samples: One swab
Urine: > 3 mL

Preferred Volume:
Swab samples: One swab
Urine: > 3 mL

Minimum Volume:
Swab samples: One swab
Urine: 3 mL

Remarks:
Swab collection kits are available from Material Services (Unisex swab PMM# 399818, Vaginal/Multitest swab PMM# 59046). Do not use expired swab collection kits.

See the lab manual's Microbiology Guide for additional collection instructions.

Stability (from collection to initiation):
Swabs: Room temperature or Refrigerated 2 months
Urine: Refrigerated 1 day

Unacceptable Conditions:
Other sample types, improperly collected specimens, leaky specimens with <1700 µL fluid in the transport tube, expired specimen collection kit used, cleaning swab (white shaft) submitted in the transport tube

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: P704
Test Group: STD
Performing Lab: Microbiology

Specimen Preparation:
Urine samples:
Enter urine volume in SDES.
• If first void urine is not specified as the sample type, or if midstream urine, enter code UMSNO in SREQ.
• Place barcode label vertically at the top of the transport tube label.
• Transfer 2 mL urine to Urine Specimen Transport Tube on receipt at China Basin. The proper fill level should be noted between the black fill lines on the transport tube label.

If a call is received from a clinician or clinic because there is concern for sexual abuse, refer them to Child and Adolescent Sexual Abuse Resource Center at SFGH (415)206-8386. RNs are on call 24 hours.

If LGV PCR ordered on rectal swab, send out:
• Order Microbiology Test Not Listed in Apex (P319).
• Collect 2 swabs, one in VHM and the other in APTIMA Unisex swab collection kit.
• Send to SFDPH for testing.
• Freeze VHM at -70°C if not sent within 72 hrs.

Preferred Volume:
Swab samples: One swab
Urine: > 3 mL

Minimum Volume:
Swab samples: One swab
Urine: 3 mL

Unacceptable Conditions:
Other sample types, improperly collected specimens, leaky specimens with <1700 µL fluid in the transport tube, expired specimen collection kit used, cleaning swab (white shaft) submitted in the transport tube

Stability (from collection to initiation):
Swabs: Room temperature or Refrigerated 2 months
Urine: Refrigerated 1 day

RESULT INTERPRETATION

Reference Interval:
Chlamydia: Not detected
N. gonorrhoeae: Not detected

ADMINISTRATIVE

CPT Codes:
87491, 87591

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat: No

Ordering Recommendations:
This assay is not intended for the evaluation of suspected sexual abuse or for other medico-legal indications.

Test Code: P704
Test Group: STD
Performing Lab: Microbiology
Performed: Test performed Monday - Friday
Methodology: Target capture, transcription mediated amplification, and dual kinetic assay technologies.
Remarks: Swab collection kits are available from Material Services (Unisex swab PMM# 399818, Vaginal/Multitest swab PMM# 59046). Do not use expired swab collection kits.

See the lab manual's Microbiology Guide for additional collection instructions.
Collect:
Endocervical, male urethral, rectal, throat, and conjunctival: Gen-Probe Aptima Unisex swab collection kit
Vaginal: Gen-Probe Aptima vaginal/multitest swab collection kit
Urine: Urine cup
Amount to Collect:
Swab samples: One swab
Urine: > 3 mL
Sample Type:
Endocervical swab, male urethral swab, rectal swab, throat swab, vaginal swab or first-void urine, conjunctival swab
Preferred Volume:
Swab samples: One swab
Urine: > 3 mL
Minimum Volume:
Swab samples: One swab
Urine: 3 mL
Unacceptable Conditions:
Other sample types, improperly collected specimens, leaky specimens with <1700 µL fluid in the transport tube, expired specimen collection kit used, cleaning swab (white shaft) submitted in the transport tube

Specimen Preparation:
Urine samples:
Enter urine volume in SDES.
• If first void urine is not specified as the sample type, or if midstream urine, enter code UMSNO in SREQ.
• Place barcode label vertically at the top of the transport tube label.
• Transfer 2 mL urine to Urine Specimen Transport Tube on receipt at China Basin. The proper fill level should be noted between the black fill lines on the transport tube label.

If a call is received from a clinician or clinic because there is concern for sexual abuse, refer them to Child and Adolescent Sexual Abuse Resource Center at SFGH (415)206-8386. RNs are on call 24 hours.

If LGV PCR ordered on rectal swab, send out:
• Order Microbiology Test Not Listed in Apex (P319).
• Collect 2 swabs, one in VHM and the other in APTIMA Unisex swab collection kit.
• Send to SFDPH for testing.
• Freeze VHM at -70°C if not sent within 72 hrs.

Reference Interval:
Chlamydia: Not detected
N. gonorrhoeae: Not detected

Synonyms:
• STD, Sexually transmitted disease
• GC
• Gonorrhoeae
• N gonorrhoeae
• CT/GC RNA

Stability (from collection to initiation):
Swabs: Room temperature or Refrigerated 2 months
Urine: Refrigerated 1 day

Reported:
1 - 4 days

CPT Codes:
87491, 87591

LDT or Modified FDA:
Yes
Chloride, 24 hour urine
CLU

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.
Methodology:
Ion selective electrode (ISE)
Reported:
Test run 2X daily. Turnaround time: 1 day
Additional Information:
Output varies with diet.
Synonyms:
- Cl
- Cl-
- Urine electrolytes

COLLECTION

Sample Type:
24 hour urine collection or random urine
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output.
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Remarks:
Refrigerate the collection container during the period of the collection.
Stability (from collection to initiation):
Refrigerated 2 days
Unacceptable Conditions:
Container not refrigerated during collection

PROCESSING

Test Code:
CLU
Test Group:
Chloride
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Unacceptable Conditions:
   - Container not refrigerated during collection

Stability (from collection to initiation):
   - Refrigerated 2 days

RESULT INTERPRETATION

Units:
   mmol/D

Reference Interval:
   Usually 50-250 mmol/D

Additional Information:
   Output varies with diet.

ADMINISTRATIVE

CPT Codes:
   82436

COMPLETE VIEW

Available Stat:
   No

Test Code:
   CLU

Test Group:
   Chloride

Performing Lab:
   Parnassus & Mission Bay Chemistry

Performed:
   Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
   Ion selective electrode (ISE)

Remarks:
   Refrigerate the collection container during the period of the collection.

Collect:
   24 hour urine collection container

Amount to Collect:
   Entire 24 hour urine output.

Sample Type:
   24 hour urine collection or random urine

Preferred Volume:
   1 mL urine

Minimum Volume:
   0.2 mL urine

Unacceptable Conditions:
   - Container not refrigerated during collection

Units:
   mmol/D

Reference Interval:
   Usually 50-250 mmol/D

Synonyms:
   - Cl
   - Cl-
• Urine electrolytes

**Stability (from collection to initiation):**

Refrigerated 2 days

**Reported:**

Test run 2X daily. Turnaround time: 1 day

**Additional Information:**

Output varies with diet.

**CPT Codes:**

82436
Chloride, Body Fluid
CLB

**ORDERING**

Ordering Recommendations:
- Not a routinely available test. See 'Additional information'

Available Stat:
- Yes

Performing Lab:
- Parnassus & Mission Bay Chemistry

Performed:
- Test available 24 hours per day 7 days per week

Methodology:
- Ion selective electrode (ISE)

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
- As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

  All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

  Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

Synonyms:
- Cl
- Cl-
- Body fluid electrolytes

**COLLECTION**

Sample Type:
- Body fluid

Collect:
- Red top or clean container

Amount to Collect:
- 5 mL fluid

Preferred Volume:
- 1 mL fluid

Minimum Volume:
- 0.2 mL fluid

Remarks:
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**PROCESSING**

Test Code:
- CLB

Test Group:
- Chloride

Performing Lab:
- Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL fluid
Minimum Volume:
0.2 mL fluid

RESULT INTERPRETATION

Units:
mmol/L
Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

ADMINISTRATIVE

CPT Codes:
82438
LOINC Codes:
54370-2

COMPLETE VIEW

Available Stat:
Yes
Ordering Recommendations:
Not a routinely available test. See 'Additional information'
Test Code:
CLB
Test Group:
Chloride
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Ion selective electrode (ISE)
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
Red top or clean container
Amount to Collect:
5 mL fluid
Sample Type:
Body fluid
Preferred Volume:
1 mL fluid
Minimum Volume:
0.2 mL fluid
Units:
mmol/L
Synonyms:
- Cl
- Cl-
- Body fluid electrolytes

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

CPT Codes:
- 82438

LOINC Codes:
- 54370-2
Chloride, Plasma / Serum
CL

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Bromide gives falsely high results.

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

Synonyms:
- Cl
- Cl-
- Electrolytes
- Anion gap

COLLECTION

Sample Type:
Plasma or serum

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
CL

Test Group:
Chloride

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
0-17 years: 97-108 mmol/L
>= 18 years: 97-108 mmol/L

1. Normal range for >18y adults was determined by testing 271 male and female healthy blood donors at UCSF.
2. Pediatric range same as adults as referenced in Soldin, "Pediatric Reference Intervals" 6th ed. 2007, Methods 1,2,3.

Additional Information:
Bromide gives falsely high results.

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

ADMINISTRATIVE

CPT Codes:
82435

LOINC Codes:
2075-0

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CL

Test Group:
Chloride

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mmol/L

Reference Interval:
0-17 years: 97-108 mmol/L

Test information subject to change
>= 18 years: 97-108 mmol/L

1. Normal range for >18y adults was determined by testing 271 male and female healthy blood donors at UCSF.  
2. Pediatric range same as adults as referenced in Soldin, “Pediatric Reference Intervals” 6th ed. 2007, Methods 1,2,3.

Synonyms:
- Cl
- Cl-
- Electrolytes
- Anion gap

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Bromide gives falsely high results.

The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

CPT Codes:
82435

LOINC Codes:
2075-0
Chloride, random urine
CLUR

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Ion selective electrode (ISE)
Reported: Test run 2X daily. Turnaround time: 1 day
Additional Information: Output varies with diet.
Synonyms:
- Cl
- Cl-
- Urine electrolytes

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: 20 mL urine
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Stability (from collection to initiation): Refrigerated 2 days

PROCESSING

Test Code: CLUR
Test Group: Chloride
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Stability (from collection to initiation): Refrigerated 2 days
Units: mmol/L

Additional Information: Output varies with diet.

ADMINISTRATIVE

CPT Codes:
  82436
LOINC Codes:
  2078-4

COMPLETE VIEW

Available Stat:
  Yes

Test Code:
  CLUR

Test Group:
  Chloride

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 24 hours per day 7 days per week

Methodology:
  Ion selective electrode (ISE)

Collect:
  Urine cup

Amount to Collect:
  20 mL urine

Sample Type:
  Random urine

Preferred Volume:
  1 mL urine

Minimum Volume:
  0.2 mL urine

Units:
  mmol/L

Synonyms:
  • Cl
  • Cl-
  • Urine electrolytes

Stability (from collection to initiation):
  Refrigerated 2 days

Reported:
  Test run 2X daily. Turnaround time: 1 day

Additional Information:
  Output varies with diet.

CPT Codes:
  82436

LOINC Codes:
  2078-4
Chloride, stool
CLST

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
4 hours

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Synonyms:
• Cl
• Cl-
• Stool electrolytes

COLLECTION

Sample Type:
Watery Stool

Collect:
Urine cup or clean container

Unacceptable Conditions:
Non-watery stool received

PROCESSING

Test Code:
CLST

Test Group:
Chloride

Performing Lab:
Parnassus Chemistry

Unacceptable Conditions:
Non-watery stool received

RESULT INTERPRETATION

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**ADMINISTRATIVE**

**CPT Codes:**
- 82438

**COMPLETE VIEW**

**Available Stat:**
- No

**Ordering Recommendations:**
- Not a routinely available test. See ‘Additional information’

**Test Code:**
- CLST

**Test Group:**
- Chloride

**Performing Lab:**
- Parnassus Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Ion selective electrode (ISE)

**Collect:**
- Urine cup or clean container

**Sample Type:**
- Watery Stool

**Unacceptable Conditions:**
- Non-watery stool received

**Synonyms:**
- • Cl
- • Cl-
- • Stool electrolytes

**Reported:**
- 4 hours

**Additional Information:**
- Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**
- 82438
Chloride, sweat
SWCL

ORDERING

Available Stat:
No
Performing Lab:
Mission Bay Chemistry
Performed:
Monday-Friday (day shift)
Methodology:
Coulometric Titration (Wescor ChloroChek 3400 Chloridometer)
Reported:
1-3 days
Additional Information:
Outpatient testing is done in the Gateway Medical Building, 6th Floor Pediatric Pulmonary Clinic, Station 6A. Patients should arrive prior to the scheduled time to allow for registration, and should bring a written request from the ordering physician. Requisitions may be faxed to (415) 476-4863 ahead of time. The test lasts about one hour, during which time the patient should remain near the laboratory to check upon the progress of the test.

The laboratory usually schedules one patient per day. Calls to schedule same-day testing are acceptable but depend on the lab staff availability. A scheduled appointment may be delayed if the laboratory has to provide urgent services to ICN or LDR patients prior to the time of the appointment. Such delays will be notified as soon as possible to the outpatient upon arrival or the inpatient's caregiver (physician or nurse). Sweat chlorides can be performed only between 8 a.m. to 1 p.m., Monday through Friday. When scheduling 1 p.m. appointments, please request unit to remind outpatients to be on time.

Sodium measurement on sweat is not offered.

Synonyms:
- Cl
- Sodium, sweat
- Cl-
- cystic fibrosis
- CF

COLLECTION

Patient Preparation:
Patient is well hydrated the day before and day of testing and dressed warmly at appointment.
Sample Type:
Sweat
Amount to Collect:
See preferred volume
Preferred Volume:
At least 15 µL sweat, collected by Mission Bay lab personnel.
Remarks:
By appointment only: call UCSF Mission Bay Chemistry Lab at 415-476-0183 from 0800-1530 hours, Monday-Friday.

PROCESSING

Test Code:
SWCL
Test Group:
Chloride
Performing Lab:
Mission Bay Chemistry

Preferred Volume:
At least 15 µL sweat, collected by Mission Bay lab personnel.

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
For infants up to and including 6 months of age:
CF unlikely: < 30 mmol/L
Intermediate: 30-59 mmol/L
Indicative of CF: >= 60 mmol/L

For individuals older than 6 months of age:
CF unlikely: < 40 mmol/L
Intermediate: 40-59 mmol/L
Indicative of CF: >= 60 mmol/L


Additional Information:
Outpatient testing is done in the Gateway Medical Building, 6th Floor Pediatric Pulmonary Clinic, Station 6A. Patients should arrive prior to the scheduled time to allow for registration, and should bring a written request from the ordering physician. Requisitions may be faxed to (415) 476-4863 ahead of time. The test lasts about one hour, during which time the patient should remain near the laboratory to check upon the progress of the test.

The laboratory usually schedules one patient per day. Calls to schedule same-day testing are acceptable but depend on the lab staff availability. A scheduled appointment may be delayed if the laboratory has to provide urgent services to ICN or LDR patients prior to the time of the appointment. Such delays will be notified as soon as possible to the outpatient upon arrival or the inpatient's caregiver (physician or nurse). Sweat chlorides can be performed only between 8 a.m. to 1 p.m., Monday through Friday. When scheduling 1 p.m. appointments, please request unit to remind outpatients to be on time.

Sodium measurement on sweat is not offered.

ADMINISTRATIVE

CPT Codes:
89230, 82438

LOINC Codes:
2077-6

COMPLETE VIEW

Available Stat:
No

Test Code:
SWCL

Test Group:
Chloride

Performing Lab:
Mission Bay Chemistry

Performed:
Monday-Friday (day shift)

Methodology:
Coulometric Titration (Wescor ChloroChek 3400 Chloridometer)

Patient Preparation:
Patient is well hydrated the day before and day of testing and dressed warmly at appointment.

Remarks:
  By appointment only: call UCSF Mission Bay Chemistry Lab at 415-476-0183 from 0800-1530 hours, Monday-Friday.

Amount to Collect:
  See preferred volume

Sample Type:
  Sweat

Preferred Volume:
  At least 15 µL sweat, collected by Mission Bay lab personnel.

Units:
  mmol/L

Reference Interval:
  For infants up to and including 6 months of age:
  CF unlikely: < 30 mmol/L
  Intermediate: 30-59 mmol/L
  Indicative of CF: >= 60 mmol/L

  For individuals older than 6 months of age:
  CF unlikely: < 40 mmol/L
  Intermediate: 40-59 mmol/L
  Indicative of CF: >= 60 mmol/L


Synonyms:
  • Cl
  • Sodium, sweat
  • Cl-
  • cystic fibrosis
  • CF

Reported:
  1-3 days

Additional Information:
  Outpatient testing is done in the Gateway Medical Building, 6th Floor Pediatric Pulmonary Clinic, Station 6A. Patients should arrive prior to the scheduled time to allow for registration, and should bring a written request from the ordering physician. Requisitions may be faxed to (415) 476-4863 ahead of time. The test lasts about one hour, during which time the patient should remain near the laboratory to check upon the progress of the test.

  The laboratory usually schedules one patient per day. Calls to schedule same-day testing are acceptable but depend on the lab staff availability. A scheduled appointment may be delayed if the laboratory has to provide urgent services to ICN or LDR patients prior to the time of the appointment. Such delays will be notified as soon as possible to the outpatient upon arrival or the inpatient’s caregiver (physician or nurse). Sweat chlorides can be performed only between 8 a.m. to 1 p.m., Monday through Friday. When scheduling 1 p.m. appointments, please request unit to remind outpatients to be on time.

  Sodium measurement on sweat is not offered.

CPT Codes:
  89230, 82438

LOINC Codes:
  2077-6
Cholesterol, HDL
HDL

ORDERING

Available Stat: No
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Direct method w/detergent solubilization and w/ cholesterol esterase and oxidase
Reported: 4 hours
Additional Information: To convert mg/dL to mmol/L (SI units) multiply by 0.0259.
Recommended values are for > 18 year olds (recommendations for children will be published at a future date).

NOTE: The HDL result may be falsely elevated when triglyceride levels exceed 400 mg/dL. The current HDL assay (Beckman LX20) may produce falsely suppressed HDL results of < 5 mg/dl in approximately 10% of patients with monoclonal proteins. Estimating the risk of atherosclerotic heart disease from the ratio of total/HDL cholesterol is no longer recommended by many experts, who believe that HDL cholesterol is most useful when employed as part of the assay for LDL Cholesterol rather than by itself. Others believe that the ratio of total/HDL cholesterol may better predict coronary risk (high risk males: > 6.0-7.0; high risk females: > 5.6-6.0). Still others believe that the most useful measurement is perhaps non-HDL Cholesterol ( [Total Cholesterol] - [HDL Cholesterol] ), the cholesterol in all lipoprotein particles containing apolipoprotein B, including VLDL. The measurement of non-HDL Cholesterol does not require fasting and does not rely upon assumptions of the Friedewald formula.

Synonyms:
- High density lipoprotein
- HDL cholesterol
- Coronary risk panel

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: HDL
Test Group: Cholesterol
Performing Lab:
**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

### RESULT INTERPRETATION

**Units:**
mg/dL

**Reference Interval:**
- **HDL Cholesterol:**
  - Acceptable: > 39 mg/dL
  - Higher risk: < 40 mg/dL
  - Lower risk: > 59 mg/dL

**Additional Information:**
To convert mg/dL to mmol/L (SI units) multiply by 0.0259.

Recommended values are for > 18 year olds (recommendations for children will be published at a future date).

**NOTE:** The HDL result may be falsely elevated when triglyceride levels exceed 400 mg/dL. The current HDL assay (Beckman LX20) may produce falsely suppressed HDL results of < 5 mg/dL in approximately 10% of patients with monoclonal proteins. Estimating the risk of atherosclerotic heart disease from the ratio of total/HDL cholesterol is no longer recommended by many experts, who believe that HDL cholesterol is most useful when employed as part of the assay for LDL Cholesterol rather than by itself. Others believe that the ratio of total/HDL cholesterol may better predict coronary risk (high risk males: > 6.0-7.0; high risk females: > 5.6-6.0). Still others believe that the most useful measurement is perhaps non-HDL Cholesterol ( [Total Cholesterol] - [HDL Cholesterol] ), the cholesterol in all lipoprotein particles containing apolipoprotein B, including VLDL. The measurement of non-HDL Cholesterol does not require fasting and does not rely upon assumptions of the Friedewald formula.

### ADMINISTRATIVE

**CPT Codes:**
- 83718

**LOINC Codes:**
- 2085-9

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
HDL

**Test Group:**
Cholesterol

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Direct method w/detergent solubilization and w/ cholesterol esterase and oxidase

**Collect:**
Gold top or Light Green top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum or plasma

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

**Units:**
mg/dL

**Reference Interval:**

- **HDL Cholesterol:**
  - Acceptable: > 39 mg/dL
  - Higher risk: < 40 mg/dL
  - Lower risk: > 59 mg/dL

**Synonyms:**
- High density lipoprotein
- HDL cholesterol
- Coronary risk panel

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

**Reported:**
4 hours

**Additional Information:**
To convert mg/dL to mmol/L (SI units) multiply by 0.0259.

Recommended values are for > 18 year oldS (recommendations for children will be published at a future date).

NOTE: The HDL result may be falsely elevated when triglyceride levels exceed 400 mg/dL. The current HDL assay (Beckman LX20) may produce falsely suppressed HDL results of < 5 mg/dl in approximately 10% of patients with monoclonal proteins. Estimating the risk of atherosclerotic heart disease from the ratio of total/HDL cholesterol is no longer recommended by many experts, who believe that HDL cholesterol is most useful when employed as part of the assay for LDL Cholesterol rather than by itself. Others believe that the ratio of total/HDL cholesterol may better predict coronary risk (high risk males: > 6.0-7.0; high risk females: > 5.6-6.0). Still others believe that the most useful measurement is perhaps non-HDL Cholesterol ( [Total Cholesterol] - [HDL Cholesterol] ), the cholesterol in all lipoprotein particles containing apolipoprotein B, including VLDL. The measurement of non-HDL Cholesterol does not require fasting and does not rely upon assumptions of the Friedewald formula.

**CPT Codes:**
83718

**LOINC Codes:**
2085-9
Cholesterol, LDL

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Calculated (Friedewald formula)
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0259.

LDL cholesterol is calculated from the formula: Total cholesterol-(HDL cholest. + Triglycerides/5). THIS ESTIMATE IS NOT RELIABLE IF TRIGLYCERIDES EXCEED 400 mg/dL, at which level the calculation of LDL cholesterol is suppressed and an explanatory comment is appended. To obtain a more reliable estimate of LDL cholesterol in this situation, request sendout testing for direct LDL assay.

The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not be routinely required.

Synonyms:
• low density lipoprotein
• LDL cholesterol
• Coronary risk panel
• lipid panel

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
3 mL blood
Preferred Volume:
1.5 mL serum or plasma
Minimum Volume:
1 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
LDL
Test Group:
Cholesterol
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
1.5 mL serum or plasma
Minimum Volume:
1 mL serum or plasma

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:

Total Cholesterol

Children and Adolescents (< 20 y/o):
Acceptable <170 mg/dL
Borderline 170-199 mg/dL
High >199 mg/dL

Adults (>= 20 y/o):
Desirable <200 mg/dL
Borderline 200-239 mg/dL
High >239 mg/dL

HDL Cholesterol:
Acceptable >39 mg/dL
Higher risk <40 mg/dL
Lower risk >59 mg/dL

LDL cholesterol

Children and Adolescents (< 20 y/o):
Acceptable <110 mg/dL
Borderline high 110-129 mg/dL
High >129 mg/dL

Adults: (>= 20 y/o):
Optimal <100 mg/dL
Near or above optimal 100-129 mg/dL
Borderline high-risk 130-159 mg/dL
High-risk 160-189 mg/dL
Very high-risk >189 mg/dL

Total Cholesterol:HDL Cholesterol ratio:
Desirable <6.0

Non-HDL Cholesterol values for adults (> 19 y/o):
Optimal <130 mg/dL
Near or above optimal <160 mg/dL
Borderline high-risk 160-189 mg/dL
High-risk >189 mg/dL
Very high-risk >219 mg/dL

Triglycerides:
Desirable (if fasting sample) <150 mg/dL
Desirable (if not fasting sample) <200 mg/dL
If non-fasting sample is 200 mg/dL or more, testing on fasting sample is recommended.

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association Guidelines, 2013

**Additional Information:**
To convert mg/dL to mmol/L (SI units) multiply by 0.0259.

LDL cholesterol is calculated from the formula: Total cholesterol-(HDL cholest. + Triglycerides/5). THIS ESTIMATE IS NOT RELIABLE IF TRIGLYCERIDES EXCEED 400 mg/dL, at which level the calculation of LDL cholesterol is suppressed and an explanatory comment is appended. To obtain a more reliable estimate of LDL cholesterol in this situation, request sendout testing for direct LDL assay.

The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not be routinely required.
Adults (>= 20 y/o):
Desirable <200 mg/dL
Borderline 200-239 mg/dL
High >239 mg/dL

HDL Cholesterol:
Acceptable >39 mg/dL
Higher risk <40 mg/dL
Lower risk >59 mg/dL

LDL cholesterol

Children and Adolescents (< 20 y/o):
Acceptable <110 mg/dL
Borderline high 110-129 mg/dL
High >129 mg/dL

Adults: (>= 20 y/o):
Optimal <100 mg/dL
Near or above optimal 100-129 mg/dL
Borderline high-risk 130-159 mg/dL
High-risk 160-189 mg/dL
Very high-risk >189 mg/dL

Total Cholesterol:HDL Cholesterol ratio:
Desirable <6.0

Non-HDL Cholesterol values for adults (> 19 y/o):
Optimal <130 mg/dL
Near or above optimal <160 mg/dL
Borderline high-risk 160-189 mg/dL
High-risk >189 mg/dL
Very high-risk >219 mg/dL

Triglycerides:
Desirable (if fasting sample) <150 mg/dL
Desirable (if not fasting sample) <200 mg/dL

If non-fasting sample is 200 mg/dL or more, testing on fasting sample is recommended

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association Guidelines, 2013

Synonyms:
- low density lipoprotein
- LDL cholesterol
- Coronary risk panel
- lipid panel

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0259.
LDL cholesterol is calculated from the formula: Total cholesterol-(HDL cholest. + Triglycerides/5). THIS ESTIMATE IS NOT RELIABLE IF TRIGLYCERIDES EXCEED 400 mg/dL, at which level the calculation of LDL cholesterol is suppressed and an explanatory comment is appended. To obtain a more reliable estimate of LDL cholesterol in this situation, request sendout testing for direct LDL assay.

The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not be routinely required.

CPT Codes:
80061

LOINC Codes:
13457-7
Cholesterol, Total

ORDERING

Available Stat: No
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric (cholesterol esterase & cholesterol oxidase)
Reported: 4 hours
Additional Information:
Screening with total cholesterol alone is no longer recommended. In all adults aged 20 years or older, a fasting lipoprotein profile (total cholesterol, LDL cholesterol, high density lipoprotein (HDL) cholesterol, and triglyceride) should be obtained once every 5 years. If the testing opportunity is nonfasting, only the values for total cholesterol and HDL cholesterol will be usable. In such a case, if total cholesterol is $\geq 200$ mg/dL or HDL is $< 40$ mg/dL, a followup lipoprotein profile is needed for appropriate management based on LDL.

For guidelines on cholesterol screening in children, see "Pediatrics 2008; 122:198-208, Lipid Screening and Cardiovascular Health in Childhood"

Synonyms:
- Coronary risk panel

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: CHOL
Test Group: Cholesterol
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
- Children and Adolescents (< 20 y/o):
  - Acceptable: < 170 mg/dL
  - Borderline: 170-199 mg/dL
  - High: > 199 mg/dL

- Adults (>= 20 y/o):
  - Desirable: < 200 mg/dL
  - Borderline: 200-239 mg/dL
  - High: > 239 mg/dL

Additional Information:
Screening with total cholesterol alone is no longer recommended. In all adults aged 20 years or older, a fasting lipoprotein profile (total cholesterol, LDL cholesterol, high density lipoprotein (HDL) cholesterol, and triglyceride) should be obtained once every 5 years. If the testing opportunity is nonfasting, only the values for total cholesterol and HDL cholesterol will be usable. In such a case, if total cholesterol is >= 200 mg/dL or HDL is < 40 mg/dL, a followup lipoprotein profile is needed for appropriate management based on LDL.

For guidelines on cholesterol screening in children, see "Pediatrics 2008; 122:198-208, Lipid Screening and Cardiovascular Health in Childhood"

ADMINISTRATIVE

CPT Codes:
- 82465

LOINC Codes:
- 2093-3

COMPLETE VIEW

Available Stat:
- No

Test Code:
- CHOL

Test Group:
- Cholesterol

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
- Test available 24 hours per day 7 days per week

Methodology:
- Spectrophotometric (cholesterol esterase & cholesterol oxidase)

Collect:
- Gold top or Light Green top

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 0.5 mL serum or plasma

Minimum Volume:
- 0.2 mL serum or plasma

Units:
- mg/dL
Reference Interval:

Children and Adolescents (< 20 y/o):
Acceptable: < 170 mg/dL
Borderline: 170-199 mg/dL
High: > 199 mg/dL

Adults (>= 20 y/o):
Desirable: < 200 mg/dL
Borderline: 200-239 mg/dL
High: > 239 mg/dL

Synonyms:
- Coronary risk panel

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
4 hours

Additional Information:
Screening with total cholesterol alone is no longer recommended. In all adults aged 20 years or older, a fasting lipoprotein profile (total cholesterol, LDL cholesterol, high density lipoprotein (HDL) cholesterol, and triglyceride) should be obtained once every 5 years. If the testing opportunity is nonfasting, only the values for total cholesterol and HDL cholesterol will be usable. In such a case, if total cholesterol is >= 200 mg/dL or HDL is < 40 mg/dL, a followup lipoprotein profile is needed for appropriate management based on LDL.

For guidelines on cholesterol screening in children, see "Pediatrics 2008; 122:198-208, Lipid Screening and Cardiovascular Health in Childhood"

CPT Codes:
82465

LOINC Codes:
2093-3
Cholesterol, VLDL

ORDERING

Available Stat:
No

Additional Information:
The calculated result for VLDL is not reported by the laboratory but can be estimated by dividing the triglyceride value by 5 (triglyceride/5; also see the calculation for LDL Cholesterol). When triglycerides exceed 400 mg/dL, this calculation may overestimate the VLDL and should not be used. Precise measurement may require ultracentrifugation if the triglyceride level exceeds 400 mg/dL.

Synonyms:
- very low density lipoprotein
- VLDL cholesterol

PROCESSING

Test Group:
Cholesterol

RESULT INTERPRETATION

Additional Information:
The calculated result for VLDL is not reported by the laboratory but can be estimated by dividing the triglyceride value by 5 (triglyceride/5; also see the calculation for LDL Cholesterol). When triglycerides exceed 400 mg/dL, this calculation may overestimate the VLDL and should not be used. Precise measurement may require ultracentrifugation if the triglyceride level exceeds 400 mg/dL.

COMPLETE VIEW

Available Stat:
No

Test Group:
Cholesterol

Synonyms:
- very low density lipoprotein
- VLDL cholesterol

Additional Information:
The calculated result for VLDL is not reported by the laboratory but can be estimated by dividing the triglyceride value by 5 (triglyceride/5; also see the calculation for LDL Cholesterol). When triglycerides exceed 400 mg/dL, this calculation may overestimate the VLDL and should not be used. Precise measurement may require ultracentrifugation if the triglyceride level exceeds 400 mg/dL.
Cholinesterase - Genetic variants
CGV

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Colorimetric
Reported:
Test performed Monday. Turnaround time: 48 hours
Additional Information:
Assay includes Dibucaine #. Used to assess for genetic hypersusceptibility to muscle relaxants.
Synonyms:
- Pseudocholinesterase
- dibucaine number

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Avoid hemolysis
Stability (from collection to initiation):
Room temperature 3 weeks, refrigerated 3 weeks, frozen at -20C 1 month.
Unacceptable Conditions:
Hemolyzed samples

PROCESSING

Test Code:
CGV
Test Group:
Cholinesterase
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 7961
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
- Hemolyzed samples

Stability (from collection to initiation):
- Room temperature 3 weeks, refrigerated 3 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
- IU/L

Reference Interval:
- Cholinesterase, serum:
  - Male: 3342-7586 IU/L
  - Female: 2673-6592 IU/L

- Dibucaine number: 81.6-88.3% Inhibition

Additional Information:
- Assay includes Dibucaine #. Used to assess for genetic hypersusceptibility to muscle relaxants.

ADMINISTRATIVE

CPT Codes:
- 82480-90, 82638-90

LOINC Codes:
- 2099-0

COMPLETE VIEW

Available Stat:
- No

Test Code:
- CGV

Test Group:
- Cholinesterase

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Colorimetric

Remarks:
- Avoid hemolysis

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Unacceptable Conditions:
- Hemolyzed samples

Specimen Preparation:
- Printed 06/07/19
- Test information subject to change
Refrigerate. Order Quest # 7961

Units:
- IU/L

Reference Interval:
- Cholinesterase, serum:
  - Male: 3342-7586 IU/L
  - Female: 2673-6592 IU/L

Dibucaine number: 81.6-88.3% Inhibition

Synonyms:
- Pseudocholinesterase
- dibucaine number

Stability (from collection to initiation):
- Room temperature 3 weeks, refrigerated 3 weeks, frozen at -20°C 1 month.

Reported:
- Test performed Monday. Turnaround time: 48 hours

Additional Information:
- Assay includes Dibucaine #. Used to assess for genetic hypersusceptibility to muscle relaxants.

CPT Codes:
- 82480-90, 82638-90

LOINC Codes:
- 2099-0
Cholinesterase, RBC and Plasma
CPR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzymatic, colorimetric
Reported:
Test run Monday-Friday. Turnaround time: 1-4 days.
Additional Information:
Decreased in organophosphate poisoning. Hemolysis can lead to apparent increases in plasma cholinesterase activity, and could mask an enzyme deficiency.
Synonyms:
- Acetylcholinesterase
- organophosphates
- poisoning

COLLECTION

Sample Type:
EDTA whole blood AND EDTA Plasma
Collect:
Lavender top x2
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL blood
3 mL plasma
Minimum Volume:
2 mL blood
2 mL plasma
Remarks:
Transport immediately to laboratory
Unacceptable Conditions:
Hemolysis or lipemic sample(s)
Rejection Criteria:
Sample received either frozen or at room temperature. Failure to provide both plasma and whole blood sample.

PROCESSING

Test Code:
CPR
Test Group:
Cholinesterase
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge one tube within one hour of collection and pour off separated plasma into a plastic tube. Avoid hemolysis. Do not send
packed cells. Send whole blood and plasma samples refrigerated. Order Quest test # 338 and if patient is Brown & Toland, order LabCorp test # 214007

**Preferred Volume:**
- 3 mL blood
- 3 mL plasma

**Minimum Volume:**
- 2 mL blood
- 2 mL plasma

**Unacceptable Conditions:**
- Hemolyzed or lipemic sample(s)

**Rejection Criteria:**
- Sample received either frozen or at room temperature. Failure to provide both plasma and whole blood sample.

### RESULT INTERPRETATION

**Units:**
- IU/L

**Reference Interval:**
- RBC Cholinesterase: 9572-15031 IU/L
- Plasma cholinesterase:
  - Male: 3334-7031 IU/L
  - Female: 2504-6297 IU/L

**Additional Information:**
- Decreased in organophosphate poisoning. Hemolysis can lead to apparent increases in plasma cholinesterase activity, and could mask an enzyme deficiency.

### ADMINISTRATIVE

**CPT Codes:**
- 82482-90, 82480-90

**LOINC Codes:**
- 2099-0

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- CPR

**Test Group:**
- Cholinesterase

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Enzymatic, colorimetric

**Remarks:**
- Transport immediately to laboratory

**Collect:**
- Lavender top x2

**Amount to Collect:**
- 6 mL blood

**Sample Type:**
- EDTA whole blood AND EDTA Plasma
Preferred Volume:
- 3 mL blood
- 3 mL plasma

Minimum Volume:
- 2 mL blood
- 2 mL plasma

Rejection Criteria:
- Sample received either frozen or at room temperature. Failure to provide both plasma and whole blood sample.

Unacceptable Conditions:
- Hemolyzed or lipemic sample(s)

Specimen Preparation:
- Centrifuge one tube within one hour of collection and pour off separated plasma into a plastic tube. Avoid hemolysis. Do not send packed cells. Send whole blood and plasma samples refrigerated. Order Quest test # 338 and if patient is Brown & Toland, order LabCorp test # 214007

Units:
- IU/L

Reference Interval:
- RBC Cholinesterase: 9572-15031 IU/L
- Plasma cholinesterase:
  - Male: 3334-7031 IU/L
  - Female: 2504-6297 IU/L

Synonyms:
- Acetylcholinesterase
- organophosphate
- poisoning

Reported:
- Test run Monday-Friday. Turnaround time: 1-4 days.

Additional Information:
- Decreased in organophosphate poisoning. Hemolysis can lead to apparent increases in plasma cholinesterase activity, and could mask an enzyme deficiency.

CPT Codes:
- 82482-90, 82480-90

LOINC Codes:
- 2099-0
Chromium, 24 hour urine
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Atomic Absorption
Reported:
Test run Monday, Wednesday, Friday. Turnaround time: 2-5 days.
Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 19.2.
Synonyms:
• Cr

COLLECTION

Sample Type:
24 hour urine collection.
Collect:
Acid washed 24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output.
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Chromium
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate aliquot. For 24 hour urine order Quest # 10944X.
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 19.2.

CPT Codes:
82495-90

Complete View

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Chromium

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Atomic Absorption

Collect:
Acid washed 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output.

Sample Type:
24 hour urine collection.

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate aliquot. For 24 hour urine order Quest # 10944X.

Units:
µg/L (mcg/L)

Reference Interval:
<= 2 µg/L

Synonyms:
• Cr

Reported:
Test run Monday, Wednesday, Friday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 19.2.

CPT Codes:
82495-90
Chromium, plasma
CHRO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Atomic Absorption Spectrometry with Zeeman Background Correction
Reported:
Run 2x per week. Turnaround 4-6 days
Synonyms:
- Cr

COLLECTION

Patient Preparation:
Patient should refrain from taking vitamins, mineral or herbal supplements at least one week prior to specimen collection.
Sample Type:
EDTA Plasma
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
5 mL blood
Preferred Volume:
2 mL plasma
Minimum Volume:
1 mL plasma
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen at -20C 2 weeks.

PROCESSING

Test Code:
CHRO
Test Group:
Chromium
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge and pour off plasma into a trace metal free container. Transport to China Basin sendouts refrigerated. Order Quest #95019P. For B&T patients order LabCorp test #071522
Preferred Volume:
2 mL plasma
Minimum Volume:
1 mL plasma
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen at -20C 2 weeks.
RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
<= 3.5 µg/L

ADMINISTRATIVE

CPT Codes:
82495-90

LOINC Codes:
5622-6

COMPLETE VIEW

Available Stat:
No

Test Code:
CHRO

Test Group:
Chromium

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Atomic Absorption Spectrometry with Zeeman Background Correction

Patient Preparation:
Patient should refrain from taking vitamins, mineral or herbal supplements at least one week prior to specimen collection.

Collect:
Navy blue top (EDTA) tube

Amount to Collect:
5 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
2 mL plasma

Minimum Volume:
1 mL plasma

Specimen Preparation:
Centrifuge and pour off plasma into a trace metal free container. Transport to China Basin sendouts refrigerated. Order Quest #95019P. For B&T patients order LabCorp test #071522

Units:
µg/L (mcg/L)

Reference Interval:
<= 3.5 µg/L

Synonyms:
• Cr

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen at -20C 2 weeks.

Reported:
Run 2x per week. Turnaround 4-6 days

CPT Codes:
82495-90
LOINC Codes:
5622-6
Chromium, random urine
CHROR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Atomic Absorption
Reported:
Performed once per week, Turnaround 7-14 days.
Synonyms:
- Cr

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
5 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks.

PROCESSING

Test Code:
CHROR
Test Group:
Chromium
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot into an acid-washed container. Refrigerate urine aliquot at 4C. Order Quest test # 11278x
Preferred Volume:
5 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks.

RESULT INTERPRETATION

Units:
ng/mL  
Reference Interval:  
    Chromium: <2.0 ng/mL  
    Chromium:Creatinine ratio: <5

ADMINISTRATIVE

CPT Codes:
    82495-90, 82570-90  
LOINC Codes:
    5623-4

COMPLETE VIEW

Available Stat:
    No  
Test Code:
    CHROR  
Test Group:
    Chromium  
Performing Lab:
    Quest  
Sendout:
    Yes  
Methodology:
    Atomic Absorption  
Collect:
    Urine cup  
Amount to Collect:
    5 mL urine  
Sample Type:
    Random urine  
Preferred Volume:
    5 mL urine  
Minimum Volume:
    0.5 mL urine  
Specimen Preparation:
    Aliquot into an acid-washed container. Refrigerate urine aliquot at 4C. Order Quest test # 11278x  
Units:
    ng/mL  
Reference Interval:
    Chromium: <2.0 ng/mL  
    Chromium:Creatinine ratio: <5

Synonyms:
    • Cr  
Stability (from collection to initiation):
    Room temperature 3 days, refrigerated 2 weeks.

Reported:
    Performed once per week, Turnaround 7-14 days.

CPT Codes:
    82495-90, 82570-90  
LOINC Codes:
    5623-4
Chromogranin A
CGA

ORDERING

Ordering Recommendations:
Assay aids in monitoring but is not recommended for diagnosis of carcinoid tumors. Assay may be useful in monitoring nonsecretory sympathetic and parasympathetic neuroendocrine tumors.

Performing Lab:
ARUP

Performed:
Mon, Wed, Fri

Methodology:
Quantitative Enzyme Immunoassay

Reported:
1-6 days

Synonyms:
• CgA

COLLECTION

Collect:
Serum separator tube or plain red.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 6 weeks

Storage/Transport Temperature:
Frozen.

Unacceptable Conditions:
Plasma.

PROCESSING

Test Code:
CGA

ARUP Test Code:
0080469

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow serum specimen to clot completely at room temperature. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:
Plasma.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 6 weeks

Storage/Transport Temperature:
Frozen.

RESULT INTERPRETATION

Reference Interval:
Effective May 16, 2011
0-95 ng/mL

**Interpretive Data:**
This test is performed using the Cisbio CGA-ELISA-US kit. Results obtained with different methods or kits cannot be used interchangeably.

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**ADMINISTRATIVE**

**CPT Codes:**
- 86316

**LOINC:**
- 9811-1

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**COMPLETE VIEW**

**Ordering Recommendations:**
Assay aids in monitoring but is not recommended for diagnosis of carcinoid tumors. Assay may be useful in monitoring nonsecretory sympathetic and parasympathetic neuroendocrine tumors.

**Test Code:**
- CGA

**ARUP Test Code:**
- 0080469

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon, Wed, Fri

**Methodology:**
- Quantitative Enzyme Immunoassay

**Collect:**
- Serum separator tube or plain red.

**Unacceptable Conditions:**
- Plasma.

**Specimen Preparation:**
- Allow serum specimen to clot completely at room temperature. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

**Reference Interval:**
- Effective May 16, 2011
  - 0-95 ng/mL

**Interpretive Data:**
This test is performed using the Cisbio CGA-ELISA-US kit. Results obtained with different methods or kits cannot be used interchangeably.

**Synonyms:**
- CgA

**Storage/Transport Temperature:**
- Frozen.

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 6 weeks

**Reported:**
- 1-6 days

**CPT Codes:**
- 86316
LOINC:

- 9811-1
Chromosome Analysis, Amniotic Fluid
CYAF

ORDERING

Performing Lab:  
Cytogenetics

Performed:  
Mon-Fri, 9am-5pm

Methodology:  
Giemsa banding and brightfield microscopy

Reported:  
7-14 days

Additional Information:  
If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

If additional metaphases are required for final interpretation additional counts will be performed and billed for.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:  
- Cytogenetic analysis
- Prenatal Cytogenetics
- Amniotic Fluid
- Karyotype
- Karyotyping

COLLECTION

Sample Type:  
Amniotic Fluid

Collect:  
Sterile container

Amount to Collect:  
See Preferred Volume

Preferred Volume:  
30 mL

Minimum Volume:  
10 mL

Remarks:  
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Stability (from collection to initiation):  
2 days

Storage/Transport Temperature:  
Keep samples at Room temperature.

Unacceptable Conditions:  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:  
CYAF
Test Group:
  Chromosome Analysis

Performing Lab:
  Cytogenetics

Specimen Preparation:
  Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

  Sample is to be collected in two 15 mL orange screw top polypropylene tubes. Discard first 2 mL of fluid, and then add 15-25 mL to two tubes.

Preferred Volume:
  30 mL

Minimum Volume:
  10 mL

Unacceptable Conditions:
  Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
  2 days

Storage/Transport Temperature:
  Keep samples at Room temperature.

RESULT INTERPRETATION

Reference Interval:
  46,XY normal male
  46,XX normal female

Additional Information:
  If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

  If additional metaphases are required for final interpretation additional counts will be performed and billed for.

  Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

ADMINISTRATIVE

CPT Codes:
  88235,88267,88280

COMPLETE VIEW

Test Code:
  CYAF

Test Group:
  Chromosome Analysis

Performing Lab:
  Cytogenetics

Performed:
  Mon-Fri, 9am-5pm

Methodology:
  Giemsa banding and brightfield microscopy

Remarks:
  Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Collect:
  Sterile container
Amount to Collect:
   See Preferred Volume

Sample Type:
   Amniotic Fluid

Preferred Volume:
   30 mL

Minimum Volume:
   10 mL

Unacceptable Conditions:
   Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
   Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Sample is to be collected in two 15 mL orange screw top polypropylene tubes. Discard first 2 mL of fluid, and then add 15-25 mL to two tubes.

Reference Interval:
   46,XY normal male
   46,XX normal female

Synonyms:
   • Cytogenetic analysis
   • Prenatal Cytogenetics
   • Amniotic Fluid
   • Karyotype
   • Karyotyping

Storage/Transport Temperature:
   Keep samples at Room temperature.

Stability (from collection to initiation):
   2 days

Reported:
   7-14 days

Additional Information:
   If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

   If additional metaphases are required for final interpretation additional counts will be performed and billed for.

   Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

CPT Codes:
   88235,88267,88280
Chromosome Analysis, Blood, High Resolution
CYHR

ORDERING

Approval Required:
If expedited testing is needed for clinical decisions contact the Cytogenetics laboratory at x3-4844.

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily, Monday-Friday

Methodology:
Giemsa banding and brightfield microscopy

Reported:
Normally 14-21 days. Expedited (with approval) 5-7 days

Reflex Testing:
If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

If additional metaphases are required for final interpretation additional counts will be performed and billed for.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:
- Cytogenetic analysis
- CYBL
- Karyotype
- Karyotyping

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Dark green top

Amount to Collect:
Adult or child: 5 mL blood
Infant: 2 mL blood

Preferred Volume:
Adult or child: 5 mL blood
Infant: 2 mL blood

Minimum Volume:
Adult or child: 2 mL blood
Infant: 2 mL blood

Remarks:
If expedited testing is needed for clinical decisions contact the Cytogenetics laboratory.

Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.
PROCESSING

Test Code:
  CYHR
Test Group:
  Chromosome Analysis
Performing Lab:
  Medical Genomics - Cytogenetics
Specimen Preparation:
  Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.
Preferred Volume:
  Adult or child: 5 mL blood
  Infant: 2 mL blood
Minimum Volume:
  Adult or child: 2 mL blood
  Infant: 2 mL blood
Unacceptable Conditions:
  Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.
Stability (from collection to initiation):
  48 hours

RESULT INTERPRETATION

Reference Interval:
  46,XY normal male
  46,XX normal female

ADMINISTRATIVE

CPT Codes:
  88230, 88262, 88289
LDT or Modified FDA:
  Yes
LOINC Codes:
  48818-9

COMPLETE VIEW

Approval Required:
  If expedited testing is needed for clinical decisions contact the Cytogenetics laboratory at x3-4844.
Available Stat:
  No
Test Code:
  CYHR
Test Group:
  Chromosome Analysis
Performing Lab:
  Medical Genomics - Cytogenetics
Performed:
  Set up daily, Monday-Friday
Methodology:
  Giemsa banding and brightfield microscopy
Remarks:
  If expedited testing is needed for clinical decisions contact the Cytogenetics laboratory.
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Collect:
- Dark green top

Amount to Collect:
- Adult or child: 5 mL blood
- Infant: 2 mL blood

Sample Type:
- Heparinized whole blood

Preferred Volume:
- Adult or child: 5 mL blood
- Infant: 2 mL blood

Minimum Volume:
- Adult or child: 2 mL blood
- Infant: 2 mL blood

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Reference Interval:
- 46,XY normal male
- 46,XX normal female

Synonyms:
- Cytogenetic analysis
- CYBL
- Karyotype
- Karyotyping

Stability (from collection to initiation):
- 48 hours

Reported:
- Normally 14-21 days. Expedited (with approval) 5-7 days

Reflex Testing:
- If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

If additional metaphases are required for final interpretation additional counts will be performed and billed for.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

CPT Codes:
- 88230, 88262, 88289

LDT or Modified FDA:
- Yes

LOINC Codes:
- 48818-9
Chromosome Analysis, Chorionic Villi

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily, Monday-Friday
Methodology:
Giemsa banding and brightfield microscopy
Reported:
7-14 days
Additional Information:
Minimum volume for an optimal result is greater than or equal to 5 mg. Samples less than 5 mg may result in inconclusive results and a repeat sample may be requested.

Reflex Testing:
If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

If additional metaphases are required for final interpretation additional counts will be performed and billed for.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:
- Cytogenetic analysis
- Prenatal Cytogenetics
- Chorionic villi
- CVS
- Karyotype
- Karyotyping

COLLECTION

Sample Type:
CVS
Collect:
15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.
Amount to Collect:
25 mg chorionic villi
Preferred Volume:
25 mg chorionic villi
Minimum Volume:
5 mg chorionic villi
Remarks:
Collect 25 mg and distribute into two 15 mL orange screw top polypropylene tubes that are filled with transport media. Discard and remove visible maternal deciduas prior to collecting in transport tubes.

Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.
Test Code: CYCV
Test Group: Chromosome Analysis
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.
Preferred Volume:
25 mg chorionic villi
Minimum Volume:
5 mg chorionic villi
Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

RESULT INTERPRETATION

Reference Interval:
46,XY normal male
46,XX normal female
Additional Information:
Minimum volume for an optimal result is greater than or equal to 5 mg. Samples less than 5 mg may result in inconclusive results and a repeat sample may be requested.

ADMINISTRATIVE

CPT Codes:
88235, 88267, 88280
LDT or Modified FDA:
Yes
LOINC Codes:
48818-9

COMPLETE VIEW

Available Stat:
No
Test Code: CYCV
Test Group: Chromosome Analysis
Performing Lab: Medical Genomics - Cytogenetics
Performed:
Set up daily, Monday-Friday
Methodology:
Giemsa banding and brightfield microscopy
Remarks:
Collect 25 mg and distribute into two 15 mL orange screw top polypropylene tubes that are filled with transport media. Discard and remove visible maternal deciduas prior to collecting in transport tubes.
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.
Collect:
15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

**Amount to Collect:**
25 mg chorionic villi

**Sample Type:**
CVS

**Preferred Volume:**
25 mg chorionic villi

**Minimum Volume:**
5 mg chorionic villi

**Unacceptable Conditions:**
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Specimen Preparation:**
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

**Reference Interval:**
46,XY normal male
46,XX normal female

**Synonyms:**
- Cytogenetic analysis
- Prenatal Cytogenetics
- Chorionic villi
- CVS
- Karyotype
- Karyotyping

**Reported:**
7-14 days

**Reflex Testing:**
If an abnormality is detected the Cytogenetics Director will determine the appropriate additional studies (e.g. C-banding, NOR) to be performed to characterize the abnormality.

If additional metaphases are required for final interpretation additional counts will be performed and billed for.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

**Additional Information:**
Minimum volume for an optimal result is greater than or equal to 5 mg. Samples less than 5 mg may result in inconclusive results and a repeat sample may be requested.

**CPT Codes:**
88235, 88267, 88280

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
48818-9
CHROMOSOME ANALYSIS, PEDIATRIC LEUKEMIA
LCYT, LCYTM

ORDERING

Available Stat: No
Performing Lab: Integrated Genetics
Methodology: Giemsa banding microscopy
Reported: 7-10 days
Synonyms:
- Cytogenetic analysis
- leukemia cytogenetics
- ALL
- AML

COLLECTION

Sample Type:
- Blood
- Bone marrow
Collect:
- Dark green top
Amount to Collect:
- Marrow: 3 mL
- Blood: 10 mL
Preferred Volume:
- Marrow: 3 mL
- Blood: 10 mL
Minimum Volume:
- Marrow: 2 mL
- Blood: 5 mL

PROCESSING

Test Code:
- LCYT: Blood
- LCYTM: Non blood
Sendout: Yes
Performing Lab: Integrated Genetics
Specimen Preparation:
- Keep sample at room temperature. Do not centrifuge.
Preferred Volume:
- Marrow: 3 mL
- Blood: 10 mL
Minimum Volume:
- Marrow: 2 mL
- Blood: 5 mL
ADMINISTRATIVE

CPT Codes:
88237-90, 88264-90, 88280-90 x 2

COMPLETE VIEW

Available Stat:
No

Test Code:
LCYT: Blood
LCYTM: Non blood

Performing Lab:
Integrated Genetics

Sendout:
Yes

Methodology:
Giemsa banding microscopy

Collect:
Dark green top

Amount to Collect:
Marrow: 3 mL
Blood: 10 mL

Sample Type:
Blood
Bone marrow

Preferred Volume:
Marrow: 3 mL
Blood: 10 mL

Minimum Volume:
Marrow: 2 mL
Blood: 5 mL

Specimen Preparation:
Keep sample at room temperature. Do not centrifuge.

Synonyms:
• Cytogenetic analysis
• leukemia cytogenetics
• ALL
• AML

Reported:
7-10 days

CPT Codes:
88237-90, 88264-90, 88280-90 x 2
Chromosome Analysis, Tissue (Reactivated)

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Performed: Set up daily, Monday-Friday
Methodology: Giemsa banding and brightfield microscopy
Reported: 14-28 days
Reflex Testing: If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:

- Cytogenetic analysis
- Karyotype
- Karyotyping
- Tissue cytogenetics
- products of conception
- POC

COLLECTION

Sample Type: Unfixed Tissue (including POC)
Collect: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.
Amount to Collect: 30 mg tissue
Preferred Volume: 30 mg tissue
Minimum Volume: 5 mg tissue
Remarks: Submit sample in a sterile screw-top container filled with Tissue culture transport media. If Cytogenetics tissue transport media is not available, RPMI, Hanks or sterile saline is acceptable.
Stability (from collection to initiation): Room temperature 1 day, refrigerated 1 day, frozen unacceptable.
Unacceptable Conditions: Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples; samples in formalin.

PROCESSING

Test Code: CYTIS
Test Group:
  Chromosome Analysis
Performing Lab:
  Medical Genomics - Cytogenetics
Specimen Preparation:
  Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours.
Preferred Volume:
  30 mg tissue
Minimum Volume:
  5 mg tissue
Unacceptable Conditions:
  Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples; samples in formalin.
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 1 day, frozen unacceptable.

RESULT INTERPRETATION

Reference Interval:
  46,XY normal male
  46,XX normal female

ADMINISTRATIVE

CPT Codes:
  88262, 88233
LDT or Modified FDA:
  Yes
LOINC Codes:
  48818-9

COMPLETE VIEW

Available Stat:
  No
Test Code:
  CYTIS
Test Group:
  Chromosome Analysis
Performing Lab:
  Medical Genomics - Cytogenetics
Performed:
  Set up daily, Monday-Friday
Methodology:
  Giemsa banding and brightfield microscopy
Remarks:
  Submit sample in a sterile screw-top container filled with Tissue culture transport media. If Cytogenetics tissue transport media is not available RPMI, Hanks or sterile saline is acceptable.
Collect:
  15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844.
Amount to Collect:
  30 mg tissue
Sample Type:
  Unfixed Tissue (including POC)
Preferred Volume:
30 mg tissue

**Minimum Volume:**

- 5 mg tissue

**Unacceptable Conditions:**

- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples; samples in formalin.

**Specimen Preparation:**

- Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours.

**Reference Interval:**

- 46,XY normal male
- 46,XX normal female

**Synonyms:**

- Cytogenetic analysis
- Karyotype
- Karyotyping
- Tissue cytogenetics
- products of conception
- POC

**Stability (from collection to initiation):**

- Room temperature 1 day, refrigerated 1 day, frozen unacceptable.

**Reported:**

- 14-28 days

**Reflex Testing:**

- If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

  Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

**CPT Codes:**

- 88262, 88233

**LDT or Modified FDA:**

- Yes

**LOINC Codes:**

- 48818-9
Chronic Lymphocytic Leukemia FISH Panel
CYCLL, BCYCLL

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Monday - Friday day shift only
Methodology:
Fluorescence in situ Hybridization (FISH)
Reported:
1-2 weeks
Additional Information:
Includes FISH probes for the following markers: Del11q, Trisomy 12, Del13q and Del17p
Synonyms:
- CLL Fish Panel
- Del11q
- Trisomy 12
- Del13q
- Del17p
- CYCLL
- BCYCLL

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow aspirate or bone marrow core biopsy
Collect:
Dark green top
Amount to Collect:
Heparinized whole blood: 2 mL
Heparinized bone marrow aspirate: 2 mL
Bone marrow core biopsy: 2 cm
Preferred Volume:
Heparinized whole blood: 2 mL
Heparinized bone marrow aspirate: 2 mL
Bone marrow core biopsy: 2 cm
Minimum Volume:
Heparinized whole blood: 1 mL
Heparinized bone marrow aspirate: 1 mL
Bone marrow core biopsy: 1 cm
Remarks:
Mix blood or marrow samples well to prevent clotting.
Stability (from collection to initiation):
2 days

PROCESSING

Test Code:
BCYCLL: Blood
CYCLL: Bone marrow

Performing Lab:  
Medical Genomics - Cytogenetics

Specimen Preparation:  
Store at room temperature, do not centrifuge. Send to Cytogenetics asap.

Preferred Volume:  
- Heparinized whole blood: 2 mL
- Heparinized bone marrow aspirate: 2 mL
- Bone marrow core biopsy: 2 cm

Minimum Volume:  
- Heparinized whole blood: 1 mL
- Heparinized bone marrow aspirate: 1 mL
- Bone marrow core biopsy: 1 cm

Stability (from collection to initiation):  
2 days

RESULT INTERPRETATION

Additional Information:  
Includes FISH probes for the following markers: Del11q, Trisomy 12, Del13q and Del17p

ADMINISTRATIVE

CPT Codes:  
88271 x7, 88275 x4

LDT or Modified FDA:  
Yes

COMPLETE VIEW

Available Stat:  
No

Test Code:  
BCYCLL: Blood  
CYCLL: Bone marrow

Performing Lab:  
Medical Genomics - Cytogenetics

Performed:  
Monday - Friday day shift only

Methodology:  
Fluorescence in situ Hybridization (FISH)

Remarks:  
Mix blood or marrow samples well to prevent clotting.

Collect:  
Dark green top

Amount to Collect:  
- Heparinized whole blood: 2 mL
- Heparinized bone marrow aspirate: 2 mL
- Bone marrow core biopsy: 2 cm

Sample Type:  
Heparinized whole blood, bone marrow aspirate or bone marrow core biopsy

Preferred Volume:  
- Heparinized whole blood: 2 mL
- Heparinized bone marrow aspirate: 2 mL
- Bone marrow core biopsy: 2 cm

Minimum Volume:  

Heparinized whole blood: 1 mL
Heparinized bone marrow aspirate: 1 mL
Bone marrow core biopsy: 1 cm

**Specimen Preparation:**
Store at room temperature, do not centrifuge. Send to Cytogenetics asap.

**Synonyms:**
- CLL Fish Panel
- Del11q
- Trisomy 12
- Del13q
- Del17p
- CYCLL
- BCYCLL

**Stability (from collection to initiation):**
2 days

**Reported:**
1-2 weeks

**Additional Information:**
Includes FISH probes for the following markers: Del11q, Trisomy 12, Del13q and Del17p

**CPT Codes:**
88271 x7, 88275 x4

**LDT or Modified FDA:**
Yes

Test information subject to change
Chronic Lymphocytic Leukemia, IgVH Mutation Status
IGVHM

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: PCR, gene sequencing
Reported: Test performed once per week. Turnaround time 3-10 days.
Additional Information: Provides prognostic information for patients who have B-cell chronic lymphocytic leukemia. Patients with mutated IgH variable gene region required minimal or no chemotherapy and had prolonged survival. Patients with unmutated IgH variable gene region responded poorly to continuous multi-regimen chemotherapy and shorter survival. The delineation of mutation status is based on the degree of homology to the germline sequence. A 97% homology cut-off was found to provide a good discrimination.
Synonyms:
• B cell heavy chain mutation
• Ig heavy chain mutation

COLLECTION

Sample Type: Whole blood, bone marrow
Collect:
Blood: Lavender top preferred, Dark green top or Yellow (ACD) top acceptable
Bone marrow: Dark green top or Yellow (ACD) top
Amount to Collect:
Blood: 6 mL
Bone marrow: 3 mL
Preferred Volume:
Blood: 6 mL
Bone marrow: 3 mL
Minimum Volume:
Blood: 4 mL
Bone marrow: 3 mL
Remarks:
Due to limited sample stability, collect samples Monday-Thursday only and avoiding holidays.
Stability (from collection to initiation):
Refrigerated 3 days
Unacceptable Conditions:
Clotted sample
Rejection Criteria:
Clotted or frozen sample

PROCESSING

Test Code: IGVHM
Sendout: Yes
Performing Lab:
Quest

Specimen Preparation:
Do NOT centrifuge samples. Sore and ship refrigerated. Order Quest test # 15480X

Preferred Volume:
- Blood: 6 mL
- Bone marrow: 3 mL

Minimum Volume:
- Blood: 4 mL
- Bone marrow: 3 mL

Unacceptable Conditions:
- Clotted sample

Rejection Criteria:
- Clotted or frozen sample

Stability (from collection to initiation):
- Refrigerated 3 days

RESULT INTERPRETATION

Additional Information:
Provides prognostic information for patients who have B-cell chronic lymphocytic leukemia. Patients with mutated IgH variable gene region required minimal or no chemotherapy and had prolonged survival. Patients with unmutated IgH variable gene region responded poorly to continuous multi-regimen chemotherapy and shorter survival. The delineation of mutation status is based on the degree of homology to the germline sequence. A 97% homology cut-off was found to provide a good discrimination.

ADMINISTRATIVE

CPT Codes:
- 83891-90, 83894-90, 83900-90, 83901-90 x4, 83902-90, 83904-90, 83909-90, 83912-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- IGVHM

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- PCR, gene sequencing

Remarks:
- Due to limited sample stability, collect samples Monday-Thursday only and avoiding holidays.

Collect:
- Blood: Lavender top preferred, Dark green top or Yellow (ACD) top acceptable
- Bone marrow: Dark green top or Yellow (ACD) top

Amount to Collect:
- Blood: 6 mL
- Bone marrow: 3 mL

Sample Type:
- Whole blood, bone marrow

Preferred Volume:
- Blood: 6 mL
- Bone marrow: 3 mL

Minimum Volume:
- Blood: 4 mL
Bone marrow: 3 mL

**Rejection Criteria:**
- Clotted or frozen sample

**Unacceptable Conditions:**
- Clotted sample

**Specimen Preparation:**
- Do NOT centrifuge samples. Sore and ship refrigerated. Order Quest test # 15480X

**Synonyms:**
- B cell heavy chain mutation
- Ig heavy chain mutation

**Stability (from collection to initiation):**
- Refrigerated 3 days

**Reported:**
- Test performed once per week. Turnaround time 3-10 days.

**Additional Information:**
- Provides prognostic information for patients who have B-cell chronic lymphocytic leukemia. Patients with mutated IgH variable gene region required minimal or no chemotherapy and had prolonged survival. Patients with unmutated IgH variable gene region responded poorly to continuous multi-regimen chemotherapy and shorter survival. The delineation of mutation status is based on the degree of homology to the germline sequence. A 97% homology cut-off was found to provide a good discrimination.

**CPT Codes:**
- 83891-90, 83894-90, 83900-90, 83901-90 x4, 83902-90, 83904-90, 83909-90, 83912-90
Citrate, 24 hour urine
CITU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric, enzymatic
Reported:
Test run Tuesday-Saturday. Turnaround time: 2-5 days
Synonyms:
• Citric acid

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Remarks:
Refrigerate container before and after collection.
Instruct patient to NOT include first morning specimen at the beginning of the collection (i.e. DISCARD), and to begin to collect all subsequent voiding until the same time the next morning, INCLUDING the first morning specimen at the end of the 24 hour collection. Submit specimen to Laboratory for processing.
Unacceptable Conditions:
Container not refrigerated during collection

PROCESSING

Test Code:
CITU
Test Group:
Citrate
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Record total volume collected on request. Mix collection well, aliquot 10 mL and refrigerate. Order Quest # 11315X.
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Unacceptable Conditions:
RESULT INTERPRETATION

Units:
mg/24 h

Reference Interval:
100-1300 mg/d

ADMINISTRATIVE

CPT Codes:
82507-90, 82570-90

LOINC Codes:
6687-8

COMPLETE VIEW

Available Stat:
No

Test Code:
CITU

Test Group:
Citrate

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Spectrophotometric, enzymatic

Remarks:
Refrigerate container before and after collection.

Instruct patient to NOT include first morning specimen at the beginning of the collection (i.e. DISCARD), and to begin to collect all subsequent voiding until the same time the next morning, INCLUDING the first morning specimen at the end of the 24 hour collection. Submit specimen to Laboratory for processing.

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
10 mL urine

Minimum Volume:
2 mL urine

Unacceptable Conditions:
Container not refrigerated during collection

Specimen Preparation:
Record total volume collected on request. Mix collection well, aliquot 10 mL and refrigerate. Order Quest # 11315X.

Units:
mg/24 h

Reference Interval:
100-1300 mg/d

Synonyms:
• Citric acid

Reported:
Test run Tuesday-Saturday. Turnaround time: 2-5 days

CPT Codes:
82507-90, 82570-90

LOINC Codes:
6687-8
**Citrate, random urine**

**CITUR**

**ORDERING**

Available Stat:  
No

Performing Lab:  
Quest

Methodology:  
Spectrophotometry, enzymatic

Synonyms:  
- citric acid urine

**COLLECTION**

Sample Type:  
Random urine

Collect:  
Urine cup

Amount to Collect:  
See preferred volume

Preferred Volume:  
10 mL urine

Minimum Volume:  
2 mL urine

**PROCESSING**

Test Code:  
CITUR

Test Group:  
Citrate

Sendout:  
Yes

Performing Lab:  
Quest

Specimen Preparation:  
Refrigerate. Order Quest test #11004X

Preferred Volume:  
10 mL urine

Minimum Volume:  
2 mL urine

**RESULT INTERPRETATION**

Units:  
mg/g creatinine

Reference Interval:  
- Pediatric:
  - <1 month  NOT ESTABLISHED
  - 1-11 months  235 - 4069 mg/g creatinine
  - 1 - 9 years  11 - 1136 mg/g creatinine
  - 10 - 17 years  55 - 845 mg/g creatinine

Printed 06/07/19
Test information subject to change
>= 18 year olds:
Females 125-900 mg/g creatinine
Males 65-650 mg/g creatinine

**ADMINISTRATIVE**

CPT Codes:
82507-90, 82570-90

LOINC Codes:
13722-4

**COMPLETE VIEW**

Available Stat:
No

Test Code:
CITUR

Test Group:
Citrate

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Spectrophotometry, enzymatic

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
2 mL urine

Specimen Preparation:
Refrigerate. Order Quest test #11004X

Units:
mg/g creatinine

Reference Interval:
Pediatric:
<1 month NOT ESTABLISHED
1-11 months 235 - 4069 mg/g creatinine
1 - 9 years 11 - 1136 mg/g creatinine
10 - 17 years 55 - 845 mg/g creatinine

>= 18 year olds:
Females 125-900 mg/g creatinine
Males 65-650 mg/g creatinine

Synonyms:
- citric acid urine

CPT Codes:
82507-90, 82570-90
LOINC Codes:
13722-4
Citrate, serum
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric, enzymatic
Reported:
Test performed Tuesday-Saturday. Turnaround time: 2-4 days.
Synonyms:
- Citric acid

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Remarks:
Deliver immediately to Specimen Receiving.
Unacceptable Conditions:
Delivered to lab > 30 min after collection

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Citrate
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge and refrigerate serum.
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Delivered to lab > 30 min after collection

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units: mg/dL
Reference Interval: 1.7-3.0 mg/dL (85-156 µmol/L)

Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: Citrate
Performing Lab: Quest
Sendout: Yes
Methodology: Spectrophotometric, enzymatic
Remarks: Deliver immediately to Specimen Receiving.
Collect: Gold top
Amount to Collect: 4 mL blood
Sample Type: Serum
Preferred Volume: 2 mL serum
Minimum Volume: 1 mL serum
Unacceptable Conditions: Delivered to lab > 30 min after collection
Specimen Preparation: Centrifuge and refrigerate serum.
Units: mg/dL
Reference Interval: 1.7-3.0 mg/dL (85-156 µmol/L)
Synonyms: Citric acid
Reported: Test performed Tuesday-Saturday. Turnaround time: 2-4 days.
cKIT

ORDERING

Available Stat: No
Performing Lab: Clinical Cancer Genomics Lab (CCGL)
Methodology: PCR, sequencing
Reported: 2 weeks
Additional Information: In this assay, DNA is chosen as a starting material for detection of c-kit mutations. Because this assay relies on sequencing methodology, it should be performed on diagnostic specimens in which percent involvement is high, so optimally at diagnosis. (Sequencing assay methodology requires ~20% involvement for mutation detection). This assay is not appropriate for detection of minimal residual disease.

Synonyms:
- c-KIT
- Mast/stem cell growth factor receptor
- SCFR
- proto-oncogene c-Kit
- tyrosine-protein kinase
- CD117

COLLECTION

Sample Type: EDTA whole blood or bone marrow aspirate Note: If blood or marrow aspirate is not available formalin fixed paraffin embedded tissue can be submitted
Collect: Lavendar top
Amount to Collect:
- EDTA whole blood 5 mL
- Bone marrow aspirate in EDTA 3 mL
Preferred Volume:
- EDTA whole blood 5 mL
- Bone marrow aspirate in EDTA 3 mL
Minimum Volume:
- EDTA whole blood 1 mL
- Bone marrow aspirate in EDTA 1 mL
Stability (from collection to initiation):
- Room temperature 1 week, refrigerated 2 weeks

PROCESSING

Test Group: AML molecular markers
Sendout: Yes
Performing Lab: Clinical Cancer Genomics Lab (CCGL)
Specimen Preparation:
Do not freeze whole blood. Ship sample to CCGL at Mt Zion as soon as possible.

**Preferred Volume:**
- EDTA whole blood 5 mL
- Bone marrow aspirate in EDTA 3 mL

**Minimum Volume:**
- EDTA whole blood 1 mL
- Bone marrow aspirate in EDTA 1 mL

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks

**RESULT INTERPRETATION**

**Reference Interval:**
Negative for mutations of exons tested.

**Additional Information:**
In this assay, DNA is chosen as a starting material for detection of c-kit mutations. Because this assay relies on sequencing methodology, it should be performed on diagnostic specimens in which percent involvement is high, so optimally at diagnosis. (Sequencing assay methodology requires ~20% involvement for mutation detection). This assay is not appropriate for detection of minimal residual disease.

**ADMINISTRATIVE**

**CPT Codes:**
- 83891, 83892, 83898, 83904, 83909, 83912

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Group:**
- AML molecular markers

**Performing Lab:**
- Clinical Cancer Genomics Lab (CCGL)

**Sendout:**
- Yes

**Methodology:**
- PCR, sequencing

**Collect:**
- Lavendar top

**Amount to Collect:**
- EDTA whole blood 5 mL
- Bone marrow aspirate in EDTA 3 mL

**Sample Type:**
- EDTA whole blood or bone marrow aspirate Note: If blood or marrow aspirate is not available formalin fixed paraffin embedded tissue can be submitted

**Preferred Volume:**
- EDTA whole blood 5 mL
- Bone marrow aspirate in EDTA 3 mL

**Minimum Volume:**
- EDTA whole blood 1 mL
- Bone marrow aspirate in EDTA 1 mL

**Specimen Preparation:**
Do not freeze whole blood. Ship sample to CCGL at Mt Zion as soon as possible.

**Reference Interval:**
Negative for mutations of exons tested.

**Synonyms:**
- c-KIT
- Mast/stem cell growth factor receptor
- SCFR
- proto-oncogene c-Kit
- tyrosine-protein kinase
- CD117

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks

**Reported:**
2 weeks

**Additional Information:**
In this assay, DNA is chosen as a starting material for detection of c-kit mutations. Because this assay relies on sequencing methodology, it should be performed on diagnostic specimens in which percent involvement is high, so optimally at diagnosis. (Sequencing assay methodology requires ~20% involvement for mutation detection). This assay is not appropriate for detection of minimal residual disease.

**CPT Codes:**
83891, 83892, 83898, 83904, 83909, 83912
Clomipramine
CLMP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Liquid Chromatography Tandem Mass Spectrometry
Reported:
Test run Wednesday. Turnaround time: 3-8 days.
Additional Information:
Includes desmethyl metabolite.
Neuroleptic drugs cause increased N-Desmethyl Clomipramine.
There is great variability of N-Desmethyl Clomipramine to Clomipramine ratio of approximately 2-6:1. The reference ranges are a consensus of several publications. The distribution of individual patient concentrations is not normal. The most common side effects are dry mouth, somnolence, and tremor.
Synonyms:
• Anafranil

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum
Remarks:
Do NOT use serum separator tube. Optimum time to sample is 12-14 hours after oral dose.
Stability (from collection to initiation):
Room temperature 1 hour, refrigerated 5 days, frozen at -20C 1 month.
Unacceptable Conditions:
Sample collected in Gold top

PROCESSING

Test Code:
CLMP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate and refrigerate serum as soon as possible.
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Sample collected in Gold top

Stability (from collection to initiation):
Room temperature 1 hour, refrigerated 5 days, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
Clomipramine: 50-250 µg/L
DM-clomipramine: 150-350 µg/L
Total: 200-600 µg/L

Critical Values:
Quest Priority-1: ≥ 600 µg/L

Additional Information:
Includes desmethyl metabolite.

Neuroleptic drugs cause increased N-Desmethyl Clomipramine.

There is great variability of N-Desmethyl Clomipramine to Clomipramine ratio of approximately 2-6:1. The reference ranges are a consensus of several publications. The distribution of individual patient concentrations is not normal. The most common side effects are dry mouth, somnolence, and tremor.

ADMINISTRATIVE

CPT Codes:
83789-90

LOINC Codes:
3491-8

COMPLETE VIEW

Available Stat:
No

Test Code:
CLMP

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography Tandem Mass Spectrometry

Remarks:
Do NOT use serum separator tube. Optimum time to sample is 12-14 hours after oral dose.

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

**Unacceptable Conditions:**
Sample collected in Gold top

**Specimen Preparation:**
Separate and refrigerate serum as soon as possible.

**Units:**
µg/L (mcg/L)

**Reference Interval:**
- Clomipramine: 50-250 µg/L
- DM-clomipramine: 150-350 µg/L
- Total: 200-600 µg/L

**Critical Values:**
- Quest Priority-1: >= 600 µg/L

**Synonyms:**
- Anafranil

**Stability (from collection to initiation):**
Room temperature 1 hour, refrigerated 5 days, frozen at -20C 1 month.

**Reported:**
Test run Wednesday. Turnaround time: 3-8 days.

**Additional Information:**
- Includes desmethyl metabolite.

- Neuroleptic drugs cause increased N-Desmethyl Clomipramine.

- There is great variability of N-Desmethyl Clomipramine to Clomipramine ratio of approximately 2-6:1. The reference ranges are a consensus of several publications. The distribution of individual patient concentrations is not normal. The most common side effects are dry mouth, somnolence, and tremor.

**CPT Codes:**
- 83789-90

**LOINC Codes:**
- 3491-8
Clonazepam
CLON

ORDERING

Available Stat: 
No
Performing Lab: 
Quest
Methodology: 
LC/MS
Reported: 
Test run 4x per week. Turnaround time: 3-5 days.
Synonyms: 
- Klonopin

COLLECTION

Sample Type: 
Serum
Collect: 
Red top
Amount to Collect: 
4 mL blood
Preferred Volume: 
2 mL serum
Minimum Volume: 
1 mL serum
Remarks: 
Do NOT use serum separator tube.
Unacceptable Conditions: 
Sample collected in Gold top

PROCESSING

Test Code: 
CLON
Sendout: 
Yes
Performing Lab: 
Quest
Specimen Preparation: 
Freeze at -20C.
Preferred Volume: 
2 mL serum
Minimum Volume: 
1 mL serum
Unacceptable Conditions: 
Sample collected in Gold top

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

**Reference Interval:**
- Therapeutic: 30-60 µg/L
- Potentially toxic: > 70 µg/L.

**ADMINISTRATIVE**

- **CPT Codes:**
  - 80346-90
- **LOINC Codes:**
  - 3494-2

**COMPLETE VIEW**

- **Available Stat:**
  - No
- **Test Code:**
  - CLON
- **Performing Lab:**
  - Quest
- **Sendout:**
  - Yes
- **Methodology:**
  - LC/MS
- **Remarks:**
  - Do NOT use serum separator tube.
- **Collect:**
  - Red top
- **Amount to Collect:**
  - 4 mL blood
- **Sample Type:**
  - Serum
- **Preferred Volume:**
  - 2 mL serum
- **Minimum Volume:**
  - 1 mL serum
- **Unacceptable Conditions:**
  - Sample collected in Gold top
- **Specimen Preparation:**
  - Freeze at -20C.
- **Units:**
  - µg/L (mcg/L)
- **Reference Interval:**
  - Therapeutic: 30-60 µg/L
  - Potentially toxic: > 70 µg/L.
- **Synonyms:**
  - Klonopin
- **Reported:**
  - Test run 4x per week. Turnaround time: 3-5 days.
- **CPT Codes:**
  - 80346-90
- **LOINC Codes:**
  - 3494-2
ClonoSEQ (Formerly 'ClonoSight')

MOLT

ORDERING

Approval Required:
Yes, for inpatient orders.

Available Stat:
No

Performing Lab:
Adaptive Biotechnologies

Methodology:
PCR and next-generation sequencing

Reported:
7 days for fresh specimens; 14 days for archived specimens

Additional Information:
The previous lab (Sequenta; South San Francisco) that performed the ClonoSight test was purchased by Adaptive Biotechnologies (Seattle) in May of 2015 and is no longer accepting samples. The ClonoSight test has been replaced by the ClonoSeq assay, which is the name of a similar test that Adaptive Biotechnologies offers. These assays have been shown to be highly concordant.

All samples for clonoSEQ testing should be sent to Adaptive Biotechnologies in Seattle, WA.

For patients who were originally evaluated (had malignant clones identified) using Sequenta's ClonoSight assay, additional steps may be required prior to continuing with MRD testing on the Adaptive Biotechnologies clonoSEQ assay. It is imperative that the sendout lab be notified if a patient falls into this category so that they can work with Adaptive to transition the patient's testing to clonoSEQ.

Synonyms:
- Molecular Minimal residual disease testing
- MRD
- ClonoSight
- LymphoSight

COLLECTION

Sample Type:
EDTA anticoagulated blood or bone marrow

Collect:
Lavender top

Amount to Collect:
Blood: 10 mL
Bone marrow: 3 mL

Preferred Volume:
Blood: 10 mL
Bone marrow: 3 mL

Minimum Volume:
Blood: 10 mL
Bone marrow: 3 mL

Remarks:
All samples for clonoSEQ testing should be sent to Adaptive Biotechnologies in Seattle, WA.

Due to limited sample stability, collect samples Monday-Friday only and send via FedEx overnight, avoiding holidays. Samples are accepted by Adaptive Biotechnologies Monday through Saturday from 8AM to 5PM PT.

See Adaptive Biotechnologies website for additional specimen requirements.

Stability (from collection to initiation):
Room temperature 11 days
**PROCESSING**

**Test Code:**
- MOLT

**Sendout:**
- Yes

**Performing Lab:**
- Adaptive Biotechnologies

**Specimen Preparation:**
- Keep samples at room temperature. Forward to CB at room temperature.

**Preferred Volume:**
- Blood: 10 mL
- Bone marrow: 3 mL

**Minimum Volume:**
- Blood: 10 mL
- Bone marrow: 3 mL

**Stability (from collection to initiation):**
- Room temperature 11 days

**RESULT INTERPRETATION**

**Additional Information:**
- The previous lab (Sequenta; South San Francisco) that performed the ClonoSight test was purchased by Adaptive Biotechnologies (Seattle) in May of 2015 and is no longer accepting samples. The ClonoSight test has been replaced by the ClonoSeq assay, which is the name of a similar test that Adaptive Biotechnologies offers. These assays have been shown to be highly concordant.

- All samples for clonoSEQ testing should be sent to Adaptive Biotechnologies in Seattle, WA.

- For patients who were originally evaluated (had malignant clones identified) using Sequenta's ClonoSight assay, additional steps may be required prior to continuing with MRD testing on the Adaptive Biotechnologies clonoSEQ assay. It is imperative that the sendout lab be notified if a patient falls into this category so that they can work with Adaptive to transition the patient's testing to clonoSEQ.

**COMPLETE VIEW**

**Approval Required:**
- Yes, for inpatient orders.

**Available Stat:**
- No

**Test Code:**
- MOLT

**Performing Lab:**
- Adaptive Biotechnologies

**Sendout:**
- Yes

**Methodology:**
- PCR and next-generation sequencing

**Remarks:**
- All samples for clonoSEQ testing should be sent to Adaptive Biotechnologies in Seattle, WA.

- Due to limited sample stability, collect samples Monday-Friday only and send via FedEx overnight, avoiding holidays. Samples are accepted by Adaptive Biotechnologies Monday through Saturday from 8AM to 5PM PT.

- See Adaptive Biotechnologies website for additional specimen requirements.

**Collect:**
- Lavender top

**Amount to Collect:**
- Blood: 10 mL
Bone marrow: 3 mL

**Sample Type:**
- EDTA anticoagulated blood or bone marrow

**Preferred Volume:**
- Blood: 10 mL
- Bone marrow: 3 mL

**Minimum Volume:**
- Blood: 10 mL
- Bone marrow: 3 mL

**Specimen Preparation:**
- Keep samples at room temperature. Forward to CB at room temperature.

**Synonyms:**
- Molecular Minimal residual disease testing
- MRD
- ClonoSight
- LymphoSight

**Stability (from collection to initiation):**
- Room temperature 11 days

**Reported:**
- 7 days for fresh specimens; 14 days for archived specimens

**Additional Information:**

The previous lab (Sequenta; South San Francisco) that performed the ClonoSight test was purchased by Adaptive Biotechnologies (Seattle) in May of 2015 and is no longer accepting samples. The ClonoSight test has been replaced by the ClonoSeq assay, which is the name of a similar test that Adaptive Biotechnologies offers. These assays have been shown to be highly concordant.

All samples for clonoSEQ testing should be sent to Adaptive Biotechnologies in Seattle, WA.

For patients who were originally evaluated (had malignant clones identified) using Sequenta’s ClonoSight assay, additional steps may be required prior to continuing with MRD testing on the Adaptive Biotechnologies clonoSEQ assay. It is imperative that the sendout lab be notified if a patient falls into this category so that they can work with Adaptive to transition the patient's testing to clonoSEQ.
## Clorazepate
### NORDP

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
HPLC

**Reported:**
7-10 days

**Additional Information:**
Oxazepam (Serax(R)), an antianxiety agent, is an active but less potent metabolite of diazepam, nordiazepam, and chlordiazepoxide. Clorazepate is a benzodiazepine used to treat anxiety. It has CNS depressant effects. The primary metabolite, nordiazepam is measured by this assay.

**Synonyms:**
- Tranzene
- Desmethyldiazepam
- Nordiazepam
- Tranxene

### COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top (Gold top NOT acceptable)

**Amount to Collect:**
5 mL blood

**Preferred Volume:**
2.5 ml serum

**Minimum Volume:**
1 mL serum

**Remarks:**
Do NOT use serum separator tube.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen at -20C 1 month

**Unacceptable Conditions:**
Sample collected in Gold top.

### PROCESSING

**Test Code:**
NORDP

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Freeze at -20C. Test code NORDP orders both Clorazepate (Quest # 5274X) and Oxazepam (Quest # 808X) as a package.

**Preferred Volume:**
2.5 ml serum

**Minimum Volume:**
1 mL serum

**Unacceptable Conditions:**
Sample collected in Gold top.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen at -20°C 1 month

### RESULT INTERPRETATION

**Units:**
µg/mL (mcg/mL)

**Reference Interval:**
0.1-2.0 µg/mL

**Additional Information:**
Oxazepam (Serax(R)), an antianxiety agent, is an active but less potent metabolite of diazepam, nordiazepam, and chlordiazepoxide. Clorazepate is a benzodiazepine used to treat anxiety. It has CNS depressant effects. The primary metabolite, nordiazepam is measured by this assay.

### ADMINISTRATIVE

**CPT Codes:**
80154-90 x2

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
NORDP

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
HPLC

**Remarks:**
Do NOT use serum separator tube.

**Collect:**
Red top (Gold top NOT acceptable)

**Amount to Collect:**
5 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
2.5 ml serum

**Minimum Volume:**
1 mL serum

**Unacceptable Conditions:**
Sample collected in Gold top.

**Specimen Preparation:**
Freeze at -20°C. Test code NORDP orders both Clorazepate (Quest # 5274X) and Oxazepam (Quest # 808X) as a package.

**Units:**
µg/mL (mcg/mL)

**Reference Interval:**
Printed 06/07/19
0.1-2.0 ug/mL

**Synonyms:**
- Tranzene
- Desmethyldiazepam
- Nordiazepam
- Tranxene

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen at -20°C 1 month

**Reported:**
7-10 days

**Additional Information:**
Oxazepam (Serax(R)), an antianxiety agent, is an active but less potent metabolite of diazepam, nordiazepam, and chlordiazepoxide. Clorazepate is a benzodiazepine used to treat anxiety. It has CNS depressant effects. The primary metabolite, nordiazepam is measured by this assay.

**CPT Codes:**
80154-90 x2
**Ordering Recommendations:**

**Testing algorithm:**

- **C. difficile Bacteria and Toxin Antigen Tests**
  - Both Positive
  - C. difficile Bacteria Pos Toxin Antigen Neg
  - Both Negative

**PCR Toxin B gene**

- Positive
  - Likely Colonization
  - Clinical Assessment Needed
- Negative
  - Negative Test
  - Not consistent with CDI

- Other Results
- Test Invalid
- Submit new sample

**Approval Required:**

Contact microbiology lab to obtain approval for repeat testing within 7 days. Contact Pediatric Infectious Disease to obtain approval to do testing on patient's <1 year old. Testing for NAP1 epidemic strain of C. difficile is available with Infectious Disease approval.

**Available Stat:**

No

**Performing Lab:**

Microbiology

**Performed:**

Daily, all shifts

**Methodology:**

Rapid membrane EIA +/- PCR

**Reported:**

Same or next day

**Additional Information:**

Asymptomatic carriage is common, so only symptomatic patients should be tested. Submit stools from patients with diarrhea ONLY (>= 3 unformed stools in <= 24 hours, stool must conform to shape of container). Patients with ileus will also be tested - note this in Apex. Most patients with clinical C. difficile associated diarrhea have had prior antimicrobial therapy.
Due to high rates of colonization in children, C. difficile testing will not be performed on children < 12 months old unless prior approval is obtained from pediatric infectious disease service.

Stool samples are screened for bacterial glutamate dehydrogenase (GDH) common antigen, which identifies presence of bacteria but does not differentiate toxigenic and nontoxigenic forms. They are also screened with an immunoassay for detection of the toxin protein. Stools with one positive result for GDH antigen or toxin protein will be tested by PCR.

Patients may be colonized with toxigenic C. difficile without having clinical disease. Recent studies indicate that patients who carry C. difficile with toxin gene (identified via PCR), but without detectable toxin protein production (detected by immunoassay) are most likely colonized and may not need treatment directed at the C. difficile (Polage 2015).

Enteric contact isolation will still be necessary for patient with diarrhea who are colonized with toxigenic C. difficile since there can be transmission to other patients. Continue isolation until the patient has formed stool for at least 48 hours, is bathed, and is moved to clean linens in a clean room.

If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

Testing for the NAP1 epidemic strain of C. difficile is available with Infectious Disease approval.

**Reflex Testing:**
PCR for toxin will be performed, and billed separately, when the rapid membrane EIA is positive for only GDH antigen or only toxin.

**Synonyms:**
- Clostridium difficile Ag
- Enterocolitis
- Pseudomembranous enterocolitis
- Clostridium difficile toxin
- enterotoxin
- CDI

**COLLECTION**

**Sample Type:**
Unformed stool If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

**Collect:**
Urine cup

**Amount to Collect:**
2 ml stool

**Preferred Volume:**
2 mL stool

**Minimum Volume:**
1 mL stool

**Remarks:**
Potentially interfering substances include Vagisil cream and zinc oxide paste.

If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 3 days

**Unacceptable Conditions:**
Formed stool. Stool in preservative. More than one sample in 7 days. Samples on patients <1 year old.

**PROCESSING**

**Test Code:**
P328

**Test Group:**
Performing Lab: Microbiology

Specimen Preparation:
Samples from children <1 year old: TND as CONSUL and add code CDPED C. difficile testing not performed on children <12 month old unless prior approval obtained from Pediatric ID Service

Preferred Volume:
2 mL stool

Minimum Volume:
1 mL stool

Unacceptable Conditions:
Formed stool. Stool in preservative. More than one sample in 7 days Samples on patients <1 year old.

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 3 days

RESULT INTERPRETATION

Reference Interval:
Negative for C. difficile

Critical Values:
First sample positive for C. difficile toxin on an inpatient or patient currently in ED

Additional Information:
Asymptomatic carriage is common, so only symptomatic patients should be tested. Submit stools from patients with diarrhea ONLY (>= 3 unformed stools in <= 24 hours, stool must conform to shape of container). Patients with ileus will also be tested - note this in Apex. Most patients with clinical C. difficile associated diarrhea have had prior antimicrobial therapy.

Due to high rates of colonization in children, C. difficile testing will not be performed on children < 12 months old unless prior approval is obtained from pediatric infectious disease service.

Stool samples are screened for bacterial glutamate dehydrogenase (GDH) common antigen, which identifies presence of bacteria but does not differentiate toxigenic and nontoxigenic forms. They are also screened with an immunoassay for detection of the toxin protein. Stools with one positive result for GDH antigen or toxin protein will be tested by PCR.

Patients may be colonized with toxigenic C. difficile without having clinical disease. Recent studies indicate that patients who carry C. difficile with toxin gene (identified via PCR), but without detectable toxin protein production (detected by immunoassay) are most likely colonized and may not need treatment directed at the C. difficile (Polage 2015).

Enteric contact isolation will still be necessary for patient with diarrhea who are colonized with toxigenic C. difficile since there can be transmission to other patients. Continue isolation until the patient has formed stool for at least 48 hours, is bathed, and is moved to clean linens in a clean room.

If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

Testing for the NAP1 epidemic strain of C. difficile is available with Infectious Disease approval.

ADMINISTRATIVE

CPT Codes:
Rapid membrane EIA: 87324, 87449
PCR: 87493

LOINC Codes:
31308-0

COMPLETE VIEW

Approval Required:
Contact microbiology lab to obtain approval for repeat testing within 7 days. Contact Pediatric Infectious Disease to obtain approval to do testing on patient's <1 year old. Testing for NAP1 epidemic strain of C. difficile is available with Infectious Disease approval.
Available Stat: No
Ordering Recommendations:
Testing algorithm:

- C. difficile Bacteria and Toxin Antigen Tests
  - Both Positive
  - C. difficile Bacteria Pos
  - Toxin Antigen Neg
  - Both Negative
  - PCR
    - Toxin B gene
      - Positive
        - Likely Colonization
        - Clinical Assessment Needed
      - Negative
        - Negative Test
        - Not consistent with CDI
  - Other Results

Test Code: P328
Test Group: Clostridium difficile
Performing Lab: Microbiology
Performed:
  - Daily, all shifts
Methodology:
  - Rapid membrane EIA +/- PCR
Remarks:
  - Potentially interfering substances include Vagisil cream and zinc oxide paste.
  - If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.
Collect:
  - Urine cup
Amount to Collect:
  - 2 ml stool
Sample Type:
  - Unformed stool If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

Test information subject to change
Preferred Volume:
- 2 mL stool

Minimum Volume:
- 1 mL stool

Unacceptable Conditions:
- Formed stool. Stool in preservative. More than one sample in 7 days. Samples on patients <1 year old.

Specimen Preparation:
- Samples from children <1 year old: TND as CONSUL and add code CDPED. C. difficile testing not performed on children <12 month old unless prior approval obtained from Pediatric ID Service.

Reference Interval:
- Negative for C. difficile

Critical Values:
- First sample positive for C. difficile toxin on an inpatient or patient currently in ED

Synonyms:
- Clostridium difficile Ag
- Enterocolitis
- Pseudomembranous enterocolitis
- Clostridium difficile toxin
- enterotoxin
- CDI

Stability (from collection to initiation):
- Room temperature 1 day, refrigerated 3 days

Reported:
- Same or next day

Reflex Testing:
- PCR for toxin will be performed, and billed separately, when the rapid membrane EIA is positive for only GDH antigen or only toxin.

Additional Information:
- Asymptomatic carriage is common, so only symptomatic patients should be tested. Submit stools from patients with diarrhea ONLY (>= 3 unformed stools in <= 24 hours, stool must conform to shape of container). Patients with ileus will also be tested - note this in Apex. Most patients with clinical C. difficile associated diarrhea have had prior antimicrobial therapy.

Due to high rates of colonization in children, C. difficile testing will not be performed on children <12 months old unless prior approval is obtained from pediatric infectious disease service.

Stool samples are screened for bacterial glutamate dehydrogenase (GDH) common antigen, which identifies presence of bacteria but does not differentiate toxigenic and nontoxigenic forms. They are also screened with an immunoassay for detection of the toxin protein. Stools with one positive result for GDH antigen or toxin protein will be tested by PCR.

Patients may be colonized with toxigenic C. difficile without having clinical disease. Recent studies indicate that patients who carry C. difficile with toxin gene (identified via PCR), but without detectable toxin protein production (detected by immunoassay) are most likely colonized and may not need treatment directed at the C. difficile (Polage 2015).

Enteric contact isolation will still be necessary for patient with diarrhea who are colonized with toxigenic C. difficile since there can be transmission to other patients. Continue isolation until the patient has formed stool for at least 48 hours, is bathed, and is moved to clean linens in a clean room.

If C. difficile is clinically suspected in a patient with ileus, a rectal swab may be submitted. The swab should be visibly soiled with stool and submitted in a clean container.

Testing for the NAP1 epidemic strain of C. difficile is available with Infectious Disease approval.

CPT Codes:
- Rapid membrane EIA: 87324, 87449
- PCR: 87493

LOINC Codes:
- 31308-0
**Clozapine**

**CLOZ**

**ORDERING**

Performing Lab: Quest  
Methodology: LC/MS/MS  
Reported: 3-5 days  
Synonyms: Norclozapine

**COLLECTION**

Sample Type: Serum or plasma  
Collect: Red top, Lavender top, Dark green top  
Amount to Collect: 4 mL blood  
Preferred Volume: 2 mL Serum or plasma  
Minimum Volume: 1 mL Serum or plasma  
Remarks: Do not use tubes containing barrier gel  
Stability (from collection to initiation): Room temperature 1 day, refrigerated 5 days, frozen 1 month  
Unacceptable Conditions: Submitted in Gold top or Light green top

**PROCESSING**

Test Code: CLOZ  
Sendout: Yes  
Performing Lab: Quest  
Preferred Volume: 2 mL Serum or plasma  
Minimum Volume: 1 mL Serum or plasma  
Unacceptable Conditions: Submitted in Gold top or Light green top  
Stability (from collection to initiation): Room temperature 1 day, refrigerated 5 days, frozen 1 month

**RESULT INTERPRETATION**

Units:
µg/mL (mcg/mL)

**Reference Interval:**
Norclozapine: 25 - 400 µg/mL

**ADMINISTRATIVE**

CPT Codes:
83789-90

**COMPLETE VIEW**

Test Code:
CLOZ

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Remarks:
Do not use tubes containing barrier gel

Collect:
Red top, Lavender top, Dark green top

Amount to Collect:
4 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
2 mL Serum or plasma

Minimum Volume:
1 mL Serum or plasma

Unacceptable Conditions:
Submitted in Gold top or Light green top

Units:
µg/mL (mcg/mL)

Reference Interval:
Norclozapine: 25 - 400 µg/mL

Synonyms:
- Norclozapine

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 5 days, frozen 1 month

Reported:
3-5 days

CPT Codes:
83789-90

Test information subject to change
Cobalt, blood
COBL

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Inductively-Coupled Plasma/Mass Spectrometry
Reported: 3-4 days
Additional Information: Cobalt is part of our diet. Approximately 85% of absorbed cobalt is excreted in the urine and the remainder eliminated in stool. Toxicity may occur in select industrial environments. Cobalt is not mined in the United States so primary supplies are imported.

COLLECTION

Patient Preparation: Patient should refrain from taking mineral supplements, vitamin B-12 or vitamin B complex three days prior to specimen collection
Sample Type: EDTA whole blood
Collect: Navy blue top (EDTA) tube
Amount to Collect: 4 mL blood
Preferred Volume: 4 mL
Minimum Volume: 2 mL
Remarks: To avoid contamination, use powderless gloves.
Stability (from collection to initiation): Room temperature 2 days, refrigerated 5 days, frozen unacceptable

PROCESSING

Test Code: COBL
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Do not aliquot specimen or freeze. Refrigerate tube and forward to CB.
Preferred Volume: 4 mL
Minimum Volume: 2 mL
Stability (from collection to initiation): Room temperature 2 days, refrigerated 5 days, frozen unacceptable
### RESULT INTERPRETATION

**Units:**
- µg/L (mcg/L)

**Reference Interval:**
- ≤ 1.8 µg/L

**Additional Information:**
Cobalt is part of our diet. Approximately 85% of absorbed cobalt is excreted in the urine and the remainder eliminated in stool. Toxicity may occur in select industrial environments. Cobalt is not mined in the United States so primary supplies are imported.

### ADMINISTRATIVE

**CPT Codes:**
- 83018-90

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- COBL

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Inductively-Coupled Plasma/Mass Spectrometry

**Patient Preparation:**
- Patient should refrain from taking mineral supplements, vitamin B-12 or vitamin B complex three days prior to specimen collection

**Remarks:**
- To avoid contamination, use powderless gloves.

**Collect:**
- Navy blue top (EDTA) tube

**Amount to Collect:**
- 4 mL blood

**Sample Type:**
- EDTA whole blood

**Preferred Volume:**
- 4 mL

**Minimum Volume:**
- 2 mL

**Specimen Preparation:**
- Do not aliquot specimen or freeze. Refrigerate tube and forward to CB.

**Units:**
- µg/L (mcg/L)

**Reference Interval:**
- ≤ 1.8 µg/L

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 5 days, frozen unacceptable

**Reported:**
- 3-4 days

**Additional Information:**
Cobalt is part of our diet. Approximately 85% of absorbed cobalt is excreted in the urine and the remainder eliminated in stool. Toxicity may occur in select industrial environments. Cobalt is not mined in the United States so primary supplies are imported.

**CPT Codes:**
- 83018-90
Cocaine Metabolite, Urine, Quantitative
COCQNT

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Cocaine, Urine with Reflex to Quantitation (2012231) is preferred.
Performing Lab:
ARUP
Performed:
Sun-Sat
Methodology:
Quantitative Gas Chromatography-Mass Spectrometry
Reported:
1-4 days
Synonyms:
- Benzoylecgonine
- Benzoylmethylecgonine
- Cocaine
- Crack
- Pain Management
- Pain Management, Cocaine Metabolite with Confirmation with medMATCH, Urine
- Pain Management, Cocaine Metabolite, Quantitative, with medMATCH, Urine

COLLECTION

Collect:
Random urine.
Amount to Collect:
3.5 mL
Preferred Volume:
3.5 mL
Minimum Volume:
1.5 mL
Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years
Storage/Transport Temperature:
Room temperature.
Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
COCQNT
ARUP Test Code:
0090359
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transfer 3.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1.5 mL)

Preferred Volume:
3.5 mL

Minimum Volume:
1.5 mL

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

RESULT INTERPRETATION

Reference Interval:
Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoylecgonine</td>
<td>50 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Methodology: Quantitative Gas Chromatography-Mass Spectrometry

Positive cutoff: 50 ng/mL

For medical purposes only; not valid for forensic use.

The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:
80353 (Alt code: G0480)

LOINC:
- 3394-4

COMPLETE VIEW

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Cocaine, Urine with Reflex to Quantitation (2012231) is preferred.

Test Code:
COCQNT

ARUP Test Code:
0090359

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Gas Chromatography-Mass Spectrometry

Collect:
Random urine.

**Amount to Collect:**
3.5 mL

**Preferred Volume:**
3.5 mL

**Minimum Volume:**
1.5 mL

**Unacceptable Conditions:**
Specimens exposed to repeated freeze/thaw cycles.

**Specimen Preparation:**
Transfer 3.5 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 1.5 mL)

**Reference Interval:**
Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Benzoyleconnine</td>
<td>50 ng/mL</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
Methodology: Quantitative Gas Chromatography-Mass Spectrometry

Positive cutoff: 50 ng/mL

For medical purposes only; not valid for forensic use.

The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

**Synonyms:**
- Benzoyleconnine
- Benzoylmethyleconnine
- Cocaine
- Crack
- Pain Management
  - Pain Management, Cocaine Metabolite with Confirmation with medMATCH, Urine
  - Pain Management, Cocaine Metabolite, Quantitative, with medMATCH, Urine

**Storage/Transport Temperature:**
Room temperature.

**Stability (from collection to initiation):**
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Reported:**
1-4 days

**CPT Codes:**
80353 (Alt code: G0480)

**LOINC:**
- 3394-4
Cocaine Screen, Urine
COCU

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling
Reported: Stat 2 hours, Routine 4 hours
Additional Information: Cocaine use is measured as the benzoylecgonine metabolite. A concentration < 300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and is consistent with possible presence of this metabolite. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

Benzoylcegonine can be detected within 1-3 days after use and can be detected as long as 22 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified.

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code: COCQNT

Click here for List of Cross Reactive Substances

Synonyms:
- benzoyl-ecgonine

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20C 2 weeks

PROCESSING

Test Code: COCU
Test Group: Cocaine
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 
1 mL urine

Minimum Volume: 
0.5 mL urine

Stability (from collection to initiation): 
Refrigerated 7 days, frozen at -20C 2 weeks

RESULT INTERPRETATION

Reference Interval:
Negative

Note: a negative result indicates that cocaine metabolite is not present, or it is present at a concentration below the cutoff concentration of 300 µg/L

Additional Information:
Cocaine use is measured as the benzoylecgonine metabolite. A concentration < 300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and is consistent with possible presence of this metabolite. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

Benzoylecgonine can be detected within 1-3 days after use and can be detected as long as 22 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified.

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code: COQCNT

Click here for List of Cross Reactive Substances

ADMINISTRATIVE

CPT Codes:
80301

LOINC Codes:
3397-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
COCU

Test Group:
Cocaine

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Reference Interval: Negative

Note: a negative result indicates that cocaine metabolite is not present, or it is present at a concentration below the cutoff concentration of 300 µg/L

Synonyms: benzoyl-ecgonine

Stability (from collection to initiation): Refrigerated 7 days, frozen at -20°C 2 weeks

Reported: Stat 2 hours, Routine 4 hours

Additional Information:
Cocaine use is measured as the benzoylecgonine metabolite. A concentration < 300 µg/L is considered negative by this test. A positive result is ≥ 300 µg/L and is consistent with possible presence of this metabolite. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

Benzoylecgonine can be detected within 1-3 days after use and can be detected as long as 22 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified.

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code: COCQNT

Click here for List of Cross Reactive Substances

CPT Codes:
80301

LOINC Codes:
3397-7
Coccidia exam
P407

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift
Methodology:
Kinyoun stain
Reported:
1-3 days

Additional Information:
A screen for coccidia (Isospora, Cryptosporidium, and Cyclospora) is included in the routine stool examination for parasites (see Parasites, Stool).

If exam for coccidia is specifically requested, an acid fast smear from a concentrate is examined. There will be an additional charge for preparing a stool concentrate for staining.

Synonyms:
- Cryptosporidium
- Cyclospora
- Isospora

COLLECTION

Sample Type:
Stool
Collect:
Inpatients: Clean container
ED/Outpatients: SAF collection vial

SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.

Amount to Collect:
See preferred volume

Preferred Volume:
10 mL stool

Note: for SAF vial, fill to red line on container label

Minimum Volume:
5 mL stool

Note: for SAF vial, fill to red line on container label

Remarks:
SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.

Stability (from collection to initiation):
Unpreserved 24 hours, preserved 2 weeks

Unacceptable Conditions:
Stool in a preservative other than SAF. More than one sample received within 24 hours. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.
**PROCESSING**

**Test Code:**
P407

**Performing Lab:**
Microbiology

**Specimen Preparation:**
Transfer unpreserved stool to SAF preservative upon receipt in lab.

**Preferred Volume:**
10 mL stool

Note: for SAF vial, fill to red line on container label

**Minimum Volume:**
5 mL stool

Note: for SAF vial, fill to red line on container label

**Unacceptable Conditions:**
Stool in a preservative other than SAF. More than one sample received within 24 hours. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.

**Stability (from collection to initiation):**
Unpreserved 24 hours, preserved 2 weeks

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
A screen for coccidia (Isospora, Cryptosporidium, and Cyclospora) is included in the routine stool examination for parasites (see Parasites, Stool).

If exam for coccidia is specifically requested, an acid fast smear from a concentrate is examined. There will be an additional charge for preparing a stool concentrate for staining.

**ADMINISTRATIVE**

**CPT Codes:**
87206

**LOINC Codes:**
40958-1

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
P407

**Performing Lab:**
Microbiology

**Performed:**
Monday-Friday, day shift

**Methodology:**
Kinyoun stain

**Remarks:**
SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories' draw stations.

**Collect:**
Inpatients: Clean container  
ED/Outpatients: SAF collection vial

SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.

**Amount to Collect:**
See preferred volume

**Sample Type:**
Stool

**Preferred Volume:**
10 mL stool  
Note: for SAF vial, fill to red line on container label

**Minimum Volume:**
5 mL stool  
Note: for SAF vial, fill to red line on container label

**Unacceptable Conditions:**
Stool in a preservative other than SAF. More than one sample received within 24 hours. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.

**Specimen Preparation:**
Transfer unpreserved stool to SAF preservative upon receipt in lab.

**Reference Interval:**
Negative

**Synonyms:**
- Cryptosporidium
- Cyclospora
- Isospora

**Stability (from collection to initiation):**
Unpreserved 24 hours, preserved 2 weeks

**Reported:**
1-3 days

**Additional Information:**
A screen for coccidia (Isospora, Cryptosporidium, and Cyclospora) is included in the routine stool examination for parasites (see Parasites, Stool).

If exam for coccidia is specifically requested, an acid fast smear from a concentrate is examined. There will be an additional charge for preparing a stool concentrate for staining.

**CPT Codes:**
87206

**LOINC Codes:**
40958-1
Coccidioides immitis Antibody, Complement fixation
COCF

ORDERING

Ordering Recommendations:
The Complement fixation (CF) test for antibodies to Coccidioides should be ordered only in patients with a recent positive Immunodiffusion (ID) test.

Available Stat:
No

Performing Lab:
UC Davis Coccidiomycosis Laboratory

Methodology:
Complement fixation

 Reported:
Test run twice per week. Results available in 3-7 days

Additional Information:
UCDCF Results reported as 4+, 3+, 2+, 1+, or 0 at a given serial dilution of the specimen.

4+ is significant (or 3+ provided the immunodiffusion is also positive). 2+ and 1+ are not significant. A rising titer is unfavorable. A titer of > 1:16 in the serum is often associated with metapulmonary dissemination, but a lower titer can be associated limited dissemination e.g., single osseous or cutaneous lesion of meningeal involvement.

Samples that are anticomplementary or hemolyzed cannot be assayed by this method; use the immunodiffusion assay instead. Rise in titer is significant and parallels severity. Test is relatively specific, but rare cross-reactions may occur with blastomyces or histoplasma infections. Low CSF titers may occasionally be present, in the absence of meningitis, due to passive spill-over from extremely high serum titers.

COLLECTION

Sample Type:
Serum or CSF

Collect:
Gold top, CSF tube or sterile collection tube

Amount to Collect:
2 mL blood or 1 mL CSF

Preferred Volume:
1 mL serum or CSF

Minimum Volume:
1 mL serum or CSF

Unacceptable Conditions:
Hemolyzed samples

PROCESSING

Test Code:
COCF

Test Group:
Coccidioides immitis Antibody

Sendout:
Yes

Performing Lab:
UC Davis Coccidiomycosis Laboratory

Specimen Preparation:
Send out to UC Davis Coccidioidomycosis Serology Laboratory, School of Medicine, Room 3144 Tupper Hall, West Science Drive,
**Preferred Volume:**
- 1 mL serum or CSF

**Minimum Volume:**
- 1 mL serum or CSF

**Unacceptable Conditions:**
- Hemolyzed samples

**RESULT INTERPRETATION**

**Units:**
- See notes

**Reference Interval:**
- Negative

**Additional Information:**
- UCDCF Results reported as 4+, 3+, 2+, 1+, or 0 at a given serial dilution of the specimen.

4+ is significant (or 3+ provided the immunodiffusion is also positive). 2+ and 1+ are not significant. A rising titer is unfavorable. A titer of > 1:16 in the serum is often associated with metapulmonary dissemination, but a lower titer can be associated limited dissemination e.g., single osseous or cutaneous lesion of meningeal involvement.

Samples that are anticomplementary or hemolyzed cannot be assayed by this method; use the immunodiffusion assay instead. Rise in titer is significant and parallels severity. Test is relatively specific, but rare cross-reactions may occur with blastomyces or histoplasma infections. Low CSF titers may occasionally be present, in the absence of meningitis, due to passive spill-over from extremely high serum titers.

**ADMINISTRATIVE**

**CPT Codes:**
- 86171-90

**COMPLETE VIEW**

**Available Stat:**
- No

**Ordering Recommendations:**
- The Complement fixation (CF) test for antibodies to Coccidioides should be ordered only in patients with a recent positive Immunodiffusion (ID) test.

**Test Code:**
- COCF

**Test Group:**
- Coccidioides immitis Antibody

**Performing Lab:**
- UC Davis Coccidiomycosis Laboratory

**Sendout:**
- Yes

**Methodology:**
- Complement fixation

**Collect:**
- Gold top, CSF tube or sterile collection tube

**Amount to Collect:**
- 2 mL blood or 1 mL CSF

**Sample Type:**
- Serum or CSF

**Preferred Volume:**
- 1 mL serum or CSF
Minimum Volume:
1 mL serum or CSF

Unacceptable Conditions:
Hemolyzed samples

Specimen Preparation:
Send out to UC Davis Coccidioidomycosis Serology Laboratory, School of Medicine, Room 3144 Tupper Hall, West Science Drive, University of California, Davis, CA 95616 (By Courier)

Units:
See notes

Reference Interval:
Negative

Reported:
Test run twice per week. Results available in 3-7 days

Additional Information:
UCDCF Results reported as 4+, 3+, 2+, 1+, or 0 at a given serial dilution of the specimen.

4+ is significant (or 3+ provided the immunodiffusion is also positive). 2+ and 1+ are not significant. A rising titer is unfavorable. A titer of > 1:16 in the serum is often associated with metapulmonary dissemination, but a lower titer can be associated limited dissemination e.g., single osseous or cutaneous lesion of meningeal involvement.

Samples that are anticomplementary or hemolyzed cannot be assayed by this method; use the immunodiffusion assay instead. Rise in titer is significant and parallels severity. Test is relatively specific, but rare cross-reactions may occur with blastomyces or histoplasma infections. Low CSF titers may occasionally be present, in the absence of meningitis, due to passive spill-over from extremely high serum titers.

CPT Codes:
86171-90
Coccidioides immitis Antibody, Immunodiffusion, serum
COCC

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Tuesday, Friday (day shift)
Methodology: Immunodiffusion
Reported: 3-5 days
Additional Information: Immunodiffusion detects both IgM and IgG antibodies, the latter corresponding to the antibody measured in the CF test. If a sample is positive, the ordering MD is called and asked whether the Complement Fixation test should be performed.
Synonyms: coccidiomycosis

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum

PROCESSING

Test Code: COCC
Test Group: Coccidioides immitis Antibody
Performing Lab: Immunology
Specimen Preparation: Freeze sample at -20C.
Preferred Volume: 0.5 mL serum

RESULT INTERPRETATION

Reference Interval: Negative
Additional Information: Immunodiffusion detects both IgM and IgG antibodies, the latter corresponding to the antibody measured in the CF test. If a sample is positive, the ordering MD is called and asked whether the Complement Fixation test should be performed.

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
86635

COMPLETE VIEW

Available Stat:
No
Test Code:
COCC
Test Group:
Coccidioides immitis Antibody
Performing Lab:
Immunology
Performed:
Tuesday, Friday (day shift)
Methodology:
Immunodiffusion
Collect:
Gold top
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Specimen Preparation:
Freeze sample at -20C.
Reference Interval:
Negative
Synonyms:
• coccidiomycosis
Reported:
3-5 days
Additional Information:
Immunodiffusion detects both IgM and IgG antibodies, the latter corresponding to the antibody measured in the CF test. If a sample is positive, the ordering MD is called and asked whether the Complement Fixation test should be performed.
CPT Codes:
86635
Coenzyme Q10
CQ10

ORDERING

Performing Lab:
Quest
Methodology:
High Performance Liquid Chromatography (HPLC)
Reported:
4-6 days
Additional Information:
Coenzyme Q10 (CoQ10) is a fat soluble cofactor that is essential for energy producing metabolic pathways and for the proper functioning of the mitochondrial oxidative system. With insufficient CoQ10, the electron transfer activity of the mitochondria decreases, resulting in a net failure to produce the energy necessary to run the cell. Tissues with high energy demand have even greater demands for CoQ10. For example, heart muscle, which continually exerts a pumping action for an entire lifetime, has an immense need for the cofactor. Studies demonstrate the effectiveness of supplemental coenzyme Q10 in cardiomyopathy, myocardial dysfunction, and congestive heart failure. CoQ10 is also a powerful antioxidant like vitamins E and C, and thus serves the role of neutralizing excess free radicals. It is now well established that the control of excessive free radical activity is key in preventing/delaying the progression of degenerative diseases.
Synonyms:
- Ubiquinone 10

COLLECTION

Patient Preparation:
Patient should fast 8-12 hours prior to collection. Patient may have water. It is not necessary to discontinue nutritional supplements prior to this test.
Sample Type:
Serum (Protected from light)
Collect:
Red-top or gold-top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
- Room temperature: Unacceptable
- Refrigerated: Unacceptable
- Frozen: 7 days
Rejection Criteria:
Thawed Serum • Sample not protected from light

PROCESSING

Test Code:
CQ10
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Send serum in an amber vial or wrap a clear, plastic screw-cap vial in foil. Protect from light. Freeze and ship to CB frozen. Order Quest
Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Thawed Serum • Sample not protected from light

Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: Unacceptable
Frozen: 7 days

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
0.44-1.64 mg/L

Additional Information:
Coenzyme Q10 (CoQ10) is a fat soluble cofactor that is essential for energy producing metabolic pathways and for the proper functioning of the mitochondrial oxidative system. With insufficient CoQ10, the electron transfer activity of the mitochondria decreases, resulting in a net failure to produce the energy necessary to run the cell. Tissues with high energy demand have even greater demands for CoQ10. For example, heart muscle, which continually exerts a pumping action for an entire lifetime, has an immense need for the cofactor. Studies demonstrate the effectiveness of supplemental coenzyme Q10 in cardiomyopathy, myocardial dysfunction, and congestive heart failure. CoQ10 is also a powerful antioxidant like vitamins E and C, and thus serves the role of neutralizing excess free radicals. It is now well established that the control of excessive free radical activity is key in preventing/delaying the progression of degenerative diseases.

ADMINISTRATIVE

CPT Codes:
82542-90

LOINC Codes:
27923-2

COMPLETE VIEW

Test Code:
CQ10

Performing Lab:
Quest

Sendout:
Yes

Methodology:
High Performance Liquid Chromatography (HPLC)

Patient Preparation:
Patient should fast 8-12 hours prior to collection. Patient may have water. It is not necessary to discontinue nutritional supplements prior to this test.

Collect:
Red-top or gold-top

Amount to Collect:
2 mL blood

Sample Type:
Serum (Protected from light)

Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

Rejection Criteria:
Thawed Serum • Sample not protected from light

Specimen Preparation:
Send serum in an amber vial or wrap a clear, plastic screw-cap vial in foil. Protect from light. Freeze and ship to CB frozen. Order Quest test code 19826.

Units:
mg/L

Reference Interval:
0.44-1.64 mg/L

Synonyms:
Ubiquinone 10

Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: Unacceptable
Frozen: 7 days

Reported:
4-6 days

Additional Information:
Coenzyme Q10 (CoQ10) is a fat soluble cofactor that is essential for energy producing metabolic pathways and for the proper functioning of the mitochondrial oxidative system. With insufficient CoQ10, the electron transfer activity of the mitochondria decreases, resulting in a net failure to produce the energy necessary to run the cell. Tissues with high energy demand have even greater demands for CoQ10. For example, heart muscle, which continually exerts a pumping action for an entire lifetime, has an immense need for the cofactor. Studies demonstrate the effectiveness of supplemental coenzyme Q10 in cardiomyopathy, myocardial dysfunction, and congestive heart failure. CoQ10 is also a powerful antioxidant like vitamins E and C, and thus serves the role of neutralizing excess free radicals. It is now well established that the control of excessive free radical activity is key in preventing/delaying the progression of degenerative diseases.

CPT Codes:
82542-90

LOINC Codes:
27923-2
Cold Agglutinins
CAGG

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Reported:
2-5 days

COLLECTION

Sample Type:
EDTA or citrated plasma
Collect:
Lavender top (6 mL) OR 2 Blue tops filled to full extent of vacuum
Amount to Collect:
6 mL blood
Preferred Volume:
6 mL blood
Minimum Volume:
3 mL blood
Remarks:
Once collected, please keep all samples warm by wrapping with a heel warmer and deliver to the laboratory as soon as possible.
If collecting in citrate tube (blue top), check the expiration date on the label of the vacutainer before drawing the patient.

PROCESSING

Test Code:
CAGG
Performing Lab:
Immunology
Specimen Preparation:
Do NOT centrifuge, keep warm and deliver to Immunology asap.
Preferred Volume:
6 mL blood
Minimum Volume:
3 mL blood
Unacceptable Conditions:
Room temperature or colder sample received. Samples collected in outdated blue top vacutainer.

RESULT INTERPRETATION

Units:
titer
Reference Interval:
Negative titer < 20
CPT Codes:
- 86157

LDT or Modified FDA:
- Yes

LOINC Codes:
- 14658-9

Available Stat:
- No

Test Code:
- CAGG

Performing Lab:
- Immunology

Performed:
- Monday-Friday (day shift)

Remarks:
- Once collected, please keep all samples warm by wrapping with a heel warmer and deliver to the laboratory as soon as possible.
- If collecting in citrate tube (blue top), check the expiration date on the label of the vacutainer before drawing the patient.

Collect:
- Lavender top (6 mL) OR 2 Blue tops filled to full extent of vacuum

Amount to Collect:
- 6 mL blood

Sample Type:
- EDTA or citrated plasma

Preferred Volume:
- 6 mL blood

Minimum Volume:
- 3 mL blood

Unacceptable Conditions:
- Room temperature or colder sample received. Samples collected in outdated blue top vacutainer.

Specimen Preparation:
- Do NOT centrifuge, keep warm and deliver to Immunology asap.

Units:
- titer

Reference Interval:
- Negative titer < 20

Reported:
- 2-5 days

CPT Codes:
- 86157

LDT or Modified FDA:
- Yes

LOINC Codes:
- 14658-9
Colorado Tick Fever Antibodies (IgG & IgM)
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: IFA
Reported:
  Set up 5x per week. Turnaround 5-7 days

COLLECTION

Sample Type: Serum
Collect:
  Red top (Gold top acceptable)
Amount to Collect:
  2 mL blood
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.25 mL serum
Stability (from collection to initiation):
  Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code:
  MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
  Yes
Performing Lab:
  Quest
Specimen Preparation:
  Refrigerate sample. Order Quest # 2799F
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.25 mL serum
Stability (from collection to initiation):
  Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
  titer
Reference Interval:
  Negative IgG: < 16 titer
  Negative IgM: < 20 titer
CPT Codes:
86790-90 x2

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
IFA

Collect:
Red top (Gold top acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.25 mL serum

Specimen Preparation:
Refrigerate sample. Order Quest # 2799F

Units:
titer

Reference Interval:
Negative IgG: < 16 titer
Negative IgM: < 20 titer

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:
Set up 5x per week. Turnaround 5-7 days

CPT Codes:
86790-90 x2
Complement Activity, Alternative Pathway (AH50)
AH50A

ORDERING

Ordering Recommendations:
Initial screening for suspected deficiency in the alternative complement pathway.

Performing Lab:
ARUP

Performed:
Varies

Methodology:
Semi-Quantitative Radial Immunodiffusion

Reported:
7-14 days

Synonyms:
- AH50
- Alternate Pathway
- Alternative Complement Pathway
- Alternative Complement Pathway Function
- Alternative Pathway - Complement
- Functional Complement
- Hemolytic Complement

COLLECTION

Collect:
Serum separator tube or plain red.

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Specimen types other than serum. Refrigerated or room temperature specimens. Specimens left to clot at refrigerated temperature. Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
AH50A

ARUP Test Code:
2005373

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow specimen to clot for one hour at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and freeze. (Min: 0.3 mL)

Unacceptable Conditions:
Specimen types other than serum. Refrigerated or room temperature specimens. Specimens left to clot at refrigerated temperature. Specimens exposed to repeated freeze/thaw cycles.
Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
Effective April 2, 2012
59 percent normal or greater

Interpretive Data:
This test is intended for screening of functional activity of the alternative pathway of the complement system. Abnormal test results can be due to hereditary absence or acquired functional defect in the activity of any of the individual components of the alternative pathway. If test result is abnormal, order specific tests for evaluation of individual components of alternative pathway, including Complement Factor B (ARUP test code 0051720) and Complement Component 3 (ARUP test code 0050150).

ADMINISTRATIVE

CPT Codes:
86161

COMPLETE VIEW

Ordering Recommendations:
Initial screening for suspected deficiency in the alternative complement pathway.

Test Code:
AH50A

ARUP Test Code:
2005373

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Varies

Methodology:
Semi-Quantitative Radial Immunodiffusion

Collect:
Serum separator tube or plain red.

Unacceptable Conditions:
Specimen types other than serum. Refrigerated or room temperature specimens. Specimens left to clot at refrigerated temperature. Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Allow specimen to clot for one hour at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and freeze. (Min: 0.3 mL)

Reference Interval:
Effective April 2, 2012
59 percent normal or greater

Interpretive Data:
This test is intended for screening of functional activity of the alternative pathway of the complement system. Abnormal test results can be due to hereditary absence or acquired functional defect in the activity of any of the individual components of the alternative pathway. If test result is abnormal, order specific tests for evaluation of individual components of alternative pathway, including Complement Factor B (ARUP test code 0051720) and Complement Component 3 (ARUP test code 0050150).
Synonyms:
- AH50
- Alternate Pathway
- Alternative Complement Pathway
- Alternative Complement Pathway Function
- Alternative Pathway - Complement
- Functional Complement
- Hemolytic Complement

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Reported:
7-14 days

CPT Codes:
86161
Complement C3 Nephritic Factor (C3NEP)

ORDERING

Performing Lab:
National Jewish Health

Methodology:
Immunofixation Electrophoresis

Reported:
14 days

Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.25 mL serum

Stability (from collection to initiation):
Frozen at -70°C: 1 year

Storage/Transport Temperature:
Frozen

PROCESSING

Test Code:
C3NEP

Sendout:
Yes

Performing Lab:
National Jewish Health

Specimen Preparation:
Allow blood to clot at room temp or 37°C for 20 to 60 minutes. Centrifuge to thoroughly remove cells and immediately transfer cell-free serum to a fresh tube and freeze the cell-free serum on dry ice or at -70°C.

Preferred Volume:
1 mL serum

Minimum Volume:
0.25 mL serum

Stability (from collection to initiation):
Frozen at -70°C: 1 year

Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION
Units:
   Ratio

Reference Interval:
   Normal - Ratio is 0 - 0.26
   Equivocal - Ratio is 0.27 - 0.33
   Positive - Ratio is > 0.3

Additional Information:
   A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

ADMINISTRATIVE

CPT Codes:
   86161

COMPLETE VIEW

Test Code:
   C3NEP
Performing Lab:
   National Jewish Health
Sendout:
   Yes
Methodology:
   Immunofixation Electrophoresis
Collect:
   Red top
Amount to Collect:
   2 mL blood
Sample Type:
   Serum
Preferred Volume:
   1 mL serum
Minimum Volume:
   0.25 mL serum
Specimen Preparation:
   Allow blood to clot at room temp or 37°C for 20 to 60 minutes. Centrifuge to thoroughly remove cells and immediately transfer cell-free serum to a fresh tube and freeze the cell-free serum on dry ice or at -70°C.
Units:
   Ratio
Reference Interval:
   Normal - Ratio is 0 - 0.26
   Equivocal - Ratio is 0.27 - 0.33
   Positive - Ratio is > 0.3

Storage/Transport Temperature:
   Frozen
Stability (from collection to initiation):
   Frozen at -70°C: 1 year
Reported:
   14 days
Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

CPT Codes:
86161
Complement C3, serum

ORDERING

Available Stat:
No
Performing Lab:
   Immunology
Performed:
   Monday-Friday (day shift)
Methodology:
   Rate nephelometry
Reported:
   1-3 days
Synonyms:
   • B1C
   • Beta 1C
   • Beta complement
   • complement, beta

COLLECTION

Sample Type:
   Serum
Collect:
   Gold top
Amount to Collect:
   1 mL blood
Preferred Volume:
   0.5 mL serum
Minimum Volume:
   0.3 mL serum
Unacceptable Conditions:
   Lipemic samples

PROCESSING

Test Code:
   C3
Test Group:
   C3
Performing Lab:
   Immunology
Specimen Preparation:
   Refrigerate
Preferred Volume:
   0.5 mL serum
Minimum Volume:
   0.3 mL serum
Unacceptable Conditions:
   Lipemic samples
RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
71-159 mg/dL

ADMINISTRATIVE

CPT Codes:
86160
LOINC Codes:
4485-9

COMPLETE VIEW

Available Stat:
No
Test Code:
C3
Test Group:
C3
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Rate nephelometry
Collect:
Gold top
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples
Specimen Preparation:
Refrigerate
Units:
mg/dL
Reference Interval:
71-159 mg/dL
Synonyms:
- B1C
- Beta 1C
- Beta complement
- complement, beta
Reported:
1-3 days
Complement C4, serum

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Rate nephelometry
Reported: 1-3 days

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Lipemic samples

PROCESSING

Test Code: C4
Performing Lab: Immunology
Specimen Preparation: Refrigerate serum
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Lipemic samples

RESULT INTERPRETATION

Units: mg/dL
Reference Interval: 13-30 mg/dL
CPT Codes:
86160

LOINC Codes:
4498-2

Available Stat:
No

Test Code:
C4

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Rate nephelometry

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Lipemic samples

Specimen Preparation:
Refrigerate serum

Units:
mg/dL

Reference Interval:
13-30 mg/dL

Reported:
1-3 days

CPT Codes:
86160

LOINC Codes:
4498-2
Complement Component 2
C2

ORDERING

Ordering Recommendations:
Follow-up test for complement activity screening when CH50 is low or absent and AH50 is normal and high suspicion remains for complement deficiency.

Performing Lab:
ARUP
Performed:
Mon, Thu

Methodology:
Quantitative Radial Immunodiffusion

Reported:
5-10 days

Synonyms:
- C2
- C2 Antigen
- C2 Level
- Classical Pathway - Complement
- complement classical pathway
- Second component of complement

COLLECTION

Collect:
Serum separator tube.

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Non-frozen specimens. Specimens exposed to repeated freeze/thaw cycles. Specimens left to clot at refrigerated temperature.

PROCESSING

Test Code:
C2

ARUP Test Code:
0050148

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow specimen to clot for one hour at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.3 mL)

Unacceptable Conditions:
Non-frozen specimens. Specimens exposed to repeated freeze/thaw cycles. Specimens left to clot at refrigerated temperature.

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
Effective May 21, 2018
1.6-4.0 mg/dL

Interpretive Data:
Decreased C2 levels may be associated with increased susceptibility to infection (especially pneumococcal infections), systemic lupus erythematosus-like disease, rashes, arthritis, nephritis, and with C1-Esterase deficiency. Increased C2 levels are associated with the acute phase response.

ADMINISTRATIVE

CPT Codes:
86160

COMPLETE VIEW

Ordering Recommendations:
Follow-up test for complement activity screening when CH50 is low or absent and AH50 is normal and high suspicion remains for complement deficiency.

Test Code:
C2

ARUP Test Code:
0050148

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon, Thu

Methodology:
Quantitative Radial Immunodiffusion

Collect:
Serum separator tube.

Unacceptable Conditions:
Non-frozen specimens. Specimens exposed to repeated freeze/thaw cycles. Specimens left to clot at refrigerated temperature.

Specimen Preparation:
Allow specimen to clot for one hour at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.3 mL)

Reference Interval:
Effective May 21, 2018
1.6-4.0 mg/dL

Interpretive Data:
Decreased C2 levels may be associated with increased susceptibility to infection (especially pneumococcal infections), systemic lupus erythematosus-like disease, rashes, arthritis, nephritis, and with C1-Esterase deficiency. Increased C2 levels are associated with the acute phase response.

Synonyms:
- C2
- C2 Antigen
- C2 Level
- Classical Pathway - Complement
• complement classical pathway
• Second component of complement

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Stability (from collection to initiation):
After separation from cells: Ambient: 2 hours; Refrigerated: Unacceptable; Frozen: 2 weeks

Reported:
5-10 days

CPT Codes:
86160
Complement Factor B

ORDERING

Ordering Recommendations:
Follow-up test for complement activity screening when CH50 is normal and AH50 is low.

Performing Lab:
ARUP

Performed:
Mon, Wed, Fri

Methodology:
Quantitative Radial Immunodiffusion

Reported:
4-7 days

Synonyms:
- Alternative Pathway - Complement
- Complement alternative pathway
- Properdin Factor B

COLLECTION

Sample Type:
Serum

Collect:
Serum separator tube.

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 48 hours; Frozen: 1 year

Storage/Transport Temperature:
Frozen.

Unacceptable Conditions:
Room temperature specimens. Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
FACTB

ARUP Test Code:
0051720

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow specimen to clot for 30 minutes to one hour at refrigerated temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and place on refrigerant pack or freeze immediately. (Min: 0.3 mL)
Preferred Volume:  
1 mL serum

Minimum Volume:  
0.3 mL serum

Unacceptable Conditions:  
Room temperature specimens. Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):  
After separation from cells: Ambient: Unacceptable; Refrigerated: 48 hours; Frozen: 1 year

Storage/Transport Temperature:  
Frozen.

RESULT INTERPRETATION

Reference Interval:  
20-51 mg/dL

ADMINISTRATIVE

CPT Codes:  
86160

LOINC:  
- 2269-9

COMPLETE VIEW

Ordering Recommendations:  
Follow-up test for complement activity screening when CH50 is normal and AH50 is low.

Test Code:  
FACTB

ARUP Test Code:  
0051720

Performing Lab:  
ARUP

Sendout:  
Yes

Performed:  
Mon, Wed, Fri

Methodology:  
Quantitative Radial Immunodiffusion

Collect:  
Serum separator tube.

Amount to Collect:  
2 mL blood

Sample Type:  
Serum

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.3 mL serum

Unacceptable Conditions:  
Room temperature specimens. Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:  
Allow specimen to clot for 30 minutes to one hour at refrigerated temperature. Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube and place on refrigerant pack or freeze immediately. (Min: 0.3 mL)
Reference Interval:
20-51 mg/dL

Synonyms:
- Alternative Pathway - Complement
- Complement alternative pathway
- Properdin Factor B

Storage/Transport Temperature:
Frozen.

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 48 hours; Frozen: 1 year

Reported:
4-7 days

CPT Codes:
86160

LOINC:
- 2269-9
Complement Factor I
FACTI

ORDERING

Performing Lab:
National Jewish Health
Methodology:
Radial Immunodiffusion (RID)
Reported:
Up to 4 weeks
Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

COLLECTION

Sample Type:
Plasma
Collect:
Lavender top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Stability (from collection to initiation):
Frozen at -70°C: 1 year
Storage/Transport Temperature:
Frozen

PROCESSING

Test Code:
FACTI
Sendout:
Yes
Performing Lab:
National Jewish Health
Specimen Preparation:
Centrifuge at room temp within one half hour of collection; preferably immediately after venipuncture. Transfer the cell-free plasma to a clean tube and immediately freeze the cell-free plasma on dry ice or at -70°C.
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Stability (from collection to initiation):
Frozen at -70°C: 1 year
Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
µg/mL

Reference Interval:
Human Male: 29.3-58.5 µg/mL
Human Female: 29.3-58.5 µg/mL

Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

ADMINISTRATIVE

CPT Codes:
86160

COMPLETE VIEW

Test Code:
FACTI
Performing Lab:
National Jewish Health
Sendout:
Yes
Methodology:
Radial Immunodiffusion (RID)
Collect:
Lavender top
Amount to Collect:
2 mL blood
Sample Type:
Plasma
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Specimen Preparation:
Centrifuge at room temp within one half hour of collection; preferably immediately after venipuncture. Transfer the cell-free plasma to a clean tube and immediately freeze the cell-free plasma on dry ice or at -70°C.

Units:
µg/mL

Reference Interval:
Human Male: 29.3-58.5 µg/mL
Human Female: 29.3-58.5 µg/mL

Storage/Transport Temperature:
Frozen
Stability (from collection to initiation):
Frozen at -70°C; 1 year
Reported:
Up to 4 weeks
Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

CPT Codes:
86160
Complement, Total, serum
CH50

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Wednesday (day shift)
Methodology:
Turbidimetry
Reported:
1-7 days
Synonyms:
• CH50
• Complement, total hemolytic
• Total hemolytic complement

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
3 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Deliver immediately to lab. Test requires a freshly drawn specimen or serum which has been separated and frozen at -70C within 1/2 hour of collection. Collect a separate tube for this test as the specimen cannot be shared for other tests.

Storage/Transport Temperature:
-70C

Unacceptable Conditions:
Specimen: Microbially contaminated, highly hemolyzed, highly lipemic and samples containing particulate matter.

PROCESSING

Test Code:
CH50
Test Group:
Complement, Total
Performing Lab:
Immunology
Specimen Preparation:
Blood should be allowed to clot and the serum separated as soon as possible to prevent hemolysis. Serum should be separated and stored frozen at -70C within 1/2 hour of collection.
Preferred Volume:
0.5 mL serum
Minimum Volume:  
0.5 mL serum

Unacceptable Conditions:  
Specimen: Microbially contaminated, highly hemolyzed, highly lipemic and samples containing particulate matter.

Storage/Transport Temperature:  
-70°C

RESULT INTERPRETATION

Units:  
U/mL

Reference Interval:  
41.7 - 95.1 U/mL

ADMINISTRATIVE

CPT Codes:  
86431

LOINC Codes:  
4532-8

COMPLETE VIEW

Available Stat:  
No

Test Code:  
CH50

Test Group:  
Complement, Total

Performing Lab:  
Immunology

Performed:  
Wednesday (day shift)

Methodology:  
Turbidimetry

Remarks:  
Deliver immediately to lab. Test requires a freshly drawn specimen or serum which has been separated and frozen at -70°C within 1/2 hour of collection. Collect a separate tube for this test as the specimen cannot be shared for other tests.

Collect:  
Gold top

Amount to Collect:  
3 mL blood

Sample Type:  
Serum

Preferred Volume:  
0.5 mL serum

Minimum Volume:  
0.5 mL serum

Unacceptable Conditions:  
Specimen: Microbially contaminated, highly hemolyzed, highly lipemic and samples containing particulate matter.

Specimen Preparation:  
Blood should be allowed to clot and the serum separated as soon as possible to prevent hemolysis. Serum should be separated and stored frozen at -70°C within 1/2 hour of collection.

Units:  
U/mL
Reference Interval:
41.7 - 95.1 U/mL

Synonyms:
- CH50
- Complement, total hemolytic
- Total hemolytic complement

Storage/Transport Temperature:
-70°C

Reported:
1-7 days

CPT Codes:
86431

LOINC Codes:
4532-8
Complete Blood Count (includes Platelet Count)

CBC

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour. Routine 4 hours
Additional Information:
CBC includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*
*Each of these components may be ordered separately

Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.

WBC criticals are not called if a prior panic was reported in the preceding 24 hours.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- blood count
- CBC
- hematology survey
- RBC
- Red cell count
- Hemoglobin
- Hematocrit
- Red Cell Indices

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a microtube)

PROCESSING

Test Code:
CBC
Test Group:
CBC
Performing Lab:
   Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
   3 mL blood
Minimum Volume:
   1 mL blood (or 250 µL in a microtube)

RESULT INTERPRETATION

Reference Interval:
   See individual component entries for normal value information.
Critical Values:
   Hemoglobin: <= 7.0 g/dL
   Platelets: <= 25 x10^9/L*
   WBC: <=1.5 or >= 100 x10^9/L*

* See Additional Information

Additional Information:
   CBC includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*
   *Each of these components may be ordered separately
   Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.
   WBC criticals are not called if a prior panic was reported in the preceding 24 hours.
   If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
   85025
LOINC Codes:
   58410-2

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   CBC
Test Group:
   CBC
Performing Lab:
   Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
   Test available 24 hours per day 7 days per week
Collect:
   Lavender top
Amount to Collect:
   3 mL blood
Sample Type:
   EDTA whole blood
Preferred Volume:
   3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a microtube)

Reference Interval:
See individual component entries for normal value information.

Critical Values:
- Hemoglobin: <= 7.0 g/dL
- Platelets: <= 25 x10^9/L*
- WBC: <=1.5 or >= 100 x10^9/L*

* See Additional Information

Synonyms:
- blood count
- CBC
- hematology survey
- RBC
- Red cell count
- Hemoglobin
- Hematocrit
- Red Cell Indices

Reported:
- STAT 1 hour. Routine 4 hours

Additional Information:
- CBC includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*
  *Each of these components may be ordered separately

- Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.

- WBC criticals are not called if a prior panic was reported in the preceding 24 hours.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
- 85025

LOINC Codes:
- 58410-2
Complete Blood Count with Differential
CBCD

ORDERING

Available Stat:
    Yes
Performing Lab:
    Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
    Test available 24 hours per day 7 days per week
Reported:
    STAT 1 hour, Routine 4 hours
Additional Information:
    CBCD includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*, Leukocyte Differential

*Each of these components may be ordered separately

Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.

WBC and Neutrophil panics are not called if a prior panic was reported in the preceding 24 hours.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
    • Eosinophil
    • Basophil
    • Neutrophil
    • Granulocyte
    • Monocyte
    • Lymphocyte
    • blood count
    • CBCD
    • hematology survey
    • total eosinophil count
    • RBC
    • Red cell count
    • Hemoglobin
    • Hematocrit
    • Red Cell Indices

COLLECTION

Sample Type:
    EDTA whole blood
Collect:
    Lavender top
Amount to Collect:
    3 mL blood
Preferred Volume:
    3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a microtube)

**PROCESSING**

**Test Code:**
CBCD

**Test Group:**
CBC

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
1 mL blood (or 250 µL in a microtube)

**RESULT INTERPRETATION**

**Reference Interval:**
See individual component entries for normal value information.

**Critical Values:**
- Hemoglobin: <= 7.0 g/dL
- Neutrophils: <= 1.0 x10^9/L*
- Platelets: <= 25 x10^9/L*
- WBC: <= 1.5 or >= 100 x10^9/L*  

* See Additional Information

**Additional Information:**
CBCD includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*, Leukocyte Differential

*Each of these components may be ordered separately

Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.

WBC and Neutrophil panics are not called if a prior panic was reported in the preceding 24 hours.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**ADMINISTRATIVE**

**CPT Codes:**
85025

**LOINC Codes:**
4544-3

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
CBCD

**Test Group:**
CBC

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**
Test available 24 hours per day 7 days per week

Printed 06/07/19
Test information subject to change
Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood (or 250 µL in a microtube)

Reference Interval:
See individual component entries for normal value information.

Critical Values:
Hemoglobin: <= 7.0 g/dL
Neutrophils: <= 1.0 x10^9/L*
Platelets: <= 25 x10^9/L*
WBC: <= 1.5 or >= 100 x10^9/L*

* See Additional Information

Synonyms:
- Eosinophil
- Basophil
- Neutrophil
- Granulocyte
- Monocyte
- Lymphocyte
- blood count
- CBCD
- hematology survey
- total eosinophil count
- RBC
- Red cell count
- Hemoglobin
- Hematocrit
- Red Cell Indices

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
CBCD includes: Hematocrit*, Hemoglobin*, WBC Count*, RBC Count*, RBC Indices Platelet Count*, Leukocyte Differential

*Each of these components may be ordered separately

Platelet counts from 11-25 x10^9/L are phoned only if no previous panic value in the last 24 hours. Platelet counts < 10 x10^9/L are always called.

WBC and Neutrophil panics are not called if a prior panic was reported in the preceding 24 hours.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85025

LOINC Codes:
4544-3
Compliment Factor H
FACTH

ORDERING

Performing Lab:
National Jewish Health
Methodology:
Radial Immunodiffusion (RID)
Reported:
Up to 4 weeks
Additional Information:
Test requisition form must be completed and submitted with the sample. Please click here for a copy of the form.

COLLECTION

Sample Type:
Plasma
Collect:
Lavender top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Stability (from collection to initiation):
Frozen at -70°C: 1 year
Storage/Transport Temperature:
Frozen

PROCESSING

Test Code:
FACTH
Sendout:
Yes
Performing Lab:
National Jewish Health
Specimen Preparation:
Centrifuge at room temp within one half hour of collection; preferably immediately after venipuncture. Transfer the cell-free plasma to a clean tube and immediately freeze the cell-free plasma on dry ice or at -70°C.
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Stability (from collection to initiation):
Frozen at -70°C: 1 year
Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
μg/mL

Reference Interval:
Human Male: 160-412 μg/mL
Human Female: 160-412 μg/mL

Additional Information:
Test requisition form must be completed and submitted with the sample. Please click here for a copy of the form.

ADMINISTRATIVE

CPT Codes:
86160

COMPLETE VIEW

Test Code:
FACTH
Performing Lab:
National Jewish Health
Sendout:
Yes
Methodology:
Radial Immunodiffusion (RID)
Collect:
Lavender top
Amount to Collect:
2 mL blood
Sample Type:
Plasma
Preferred Volume:
1 mL plasma
Minimum Volume:
0.25 mL plasma
Specimen Preparation:
Centrifuge at room temp within one half hour of collection; preferably immediately after venipuncture. Transfer the cell-free plasma to a clean tube and immediately freeze the cell-free plasma on dry ice or at -70°C.
Units:
μg/mL
Reference Interval:
Human Male: 160-412 μg/mL
Human Female: 160-412 μg/mL
Storage/Transport Temperature:
Frozen
Stability (from collection to initiation):
Frozen at -70°C; 1 year
Reported:
Up to 4 weeks
Additional Information:
Test requisition form must be completed and submitted with the sample. Please click here for a copy of the form.
CPT Codes:
86160
Comprehensive Metabolic Panel, Fasting
FCMP

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Reported: STAT 1 hour, Routine 4 hours
Additional Information: Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.
Synonyms: Chem 18, Chem 20, CMP

COLLECTION

Sample Type: Plasma or serum
Collect: Light Green top preferred, Gold top acceptable
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL plasma or serum
Minimum Volume: 0.5 mL plasma or serum

PROCESSING

Test Code: FCMP
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 2 mL plasma or serum
Minimum Volume: 0.5 mL plasma or serum

RESULT INTERPRETATION

Units: Various (see normal ranges)
Reference Interval: See individual test entries
Critical Values:
- Sodium: <125 or > 155 mmol/L
- Potassium: <3.0 or > 6.0 mmol/L
- CO2, Total: <15 or > 40 mmol/L
- Glucose, neonate: <30 or > 170 mg/dL
Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.

**ADMINISTRATIVE**

CPT Codes:
80053

LOINC Codes:
24323-8

**COMPLETE VIEW**

Available Stat:
Yes

Test Code:
FCMP

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Collect:
Light Green top preferred, Gold top acceptable

Amount to Collect:
4 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
2 mL plasma or serum

Minimum Volume:
0.5 mL plasma or serum

Units:
Various (see normal ranges)

Reference Interval:
See individual test entries

Critical Values:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>&lt;125 or &gt; 155 mmol/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>&lt;3.0 or &gt; 6.0 mmol/L</td>
</tr>
<tr>
<td>CO2, Total</td>
<td>&lt;15 or &gt; 40 mmol/L</td>
</tr>
<tr>
<td>Glucose, neonate</td>
<td>&lt;30 or &gt; 170 mg/dL</td>
</tr>
<tr>
<td>Glucose, children &amp; adults</td>
<td>&lt;50 or &gt; 500 mg/dL</td>
</tr>
<tr>
<td>Calcium, Total</td>
<td>&lt;6.5 or &gt; 13.5 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Day 0)</td>
<td>&gt;6 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Day 1)</td>
<td>&gt;9 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Day 2)</td>
<td>&gt;12 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Day 3)</td>
<td>&gt;15 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Day 4)</td>
<td>&gt;18 mg/dL</td>
</tr>
<tr>
<td>Bilirubin, Total (Days 5-30)</td>
<td>&gt;21 mg/dL</td>
</tr>
</tbody>
</table>
Synonyms:
- Chem 18, Chem 20, CMP

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
- Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, fasting glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.

CPT Codes:
- 80053

LOINC Codes:
- 24323-8
Comprehensive Metabolic Panel, Random
NCMP

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.
Synonyms:
• Chem 18, Chem 20, CMP

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light Green top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum

PROCESSING

Test Code:
NCMP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum

RESULT INTERPRETATION

Units:
Various (see normal ranges)
Reference Interval:
See individual test entries
Critical Values:

<table>
<thead>
<tr>
<th>Test</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>&lt;125 or &gt; 155 mmol/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>&lt;3.0 or &gt; 6.0 mmol/L</td>
</tr>
<tr>
<td>CO2, Total</td>
<td>&lt;15 or &gt; 40 mmol/L</td>
</tr>
<tr>
<td>Glucose, neonate</td>
<td>&lt;30 or &gt; 170 mg/dL</td>
</tr>
</tbody>
</table>
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total <6.5 or > 13.5 mg/dL
Bilirubin, Total (Day 0) >6 mg/dL
Bilirubin, Total (Day 1) >9 mg/dL
Bilirubin, Total (Day 2) >12 mg/dL
Bilirubin, Total (Day 3) >15 mg/dL
Bilirubin, Total (Day 4) >18 mg/dL
Bilirubin, Total (Days 5-30) >21 mg/dL

Additional Information:
Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.

ADMINISTRATIVE

CPT Codes:
80053
LOINC Codes:
24323-8

COMPLETE VIEW

Available Stat:
Yes
Test Code:
NCMP
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Collect:
Light Green top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Sample Type:
Plasma or serum
Preferred Volume:
2 mL plasma or serum
Minimum Volume:
0.5 mL plasma or serum
Units:
Various (see normal ranges)
Reference Interval:
See individual test entries
Critical Values:
Sodium <125 or > 155 mmol/L
Potassium <3.0 or > 6.0 mmol/L
CO2, Total <15 or > 40 mmol/L
Glucose, neonate <30 or > 170 mg/dL
Glucose, children & adults <50 or > 500 mg/dL
Calcium, Total <6.5 or > 13.5 mg/dL
Bilirubin, Total (Day 0) >6 mg/dL
Bilirubin, Total (Day 1) >9 mg/dL
Bilirubin, Total (Day 2) >12 mg/dL
Bilirubin, Total (Day 3) >15 mg/dL
Bilirubin, Total (Day 4) >18 mg/dL
Bilirubin, Total (Days 5-30) >21 mg/dL
Synonyms:
  - Chem 18, Chem 20, CMP

Reported:
  STAT 1 hour, Routine 4 hours

Additional Information:
  Includes sodium, potassium, chloride, total carbon dioxide, BUN, creatinine, glucose, total calcium, albumin, total bilirubin, alkaline phosphatase, total protein, ALT, AST. Individual tests may be ordered separately.

CPT Codes:
  80053

LOINC Codes:
  24323-8
# Connexin 30 (CNXN30)

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Stanford Hospital Clinical Laboratory

**Methodology:**
- PCR

**Reported:**
- 7-14 days

**Synonyms:**
- Nonsyndromic Deafness

## COLLECTION

**Sample Type:**
- EDTA whole blood

**Collect:**
- Lavender top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 2 mL

**Minimum Volume:**
- 0.5 mL

**Remarks:**
- Patient insurance billing information MUST accompany test request when specimen is collected. Patient will be billed by Stanford Clinical Laboratory. (requires 7 mL whole blood, minimum: 3 mL) Stanford TRF: [Click here for Stanford Test Request Form](#)

## PROCESSING

**Test Code:**
- CNXN30

**Sendout:**
- Yes

**Performing Lab:**
- Stanford Hospital Clinical Laboratory

**Specimen Preparation:**
- Do not centrifuge the specimen. Store at room temperature. Send to Stanford, order their test code CX30.

**Preferred Volume:**
- 2 mL

**Minimum Volume:**
- 0.5 mL

## ADMINISTRATIVE

**CPT Codes:**
- 83891-90, 83894-90, 83898-90, 83912-90

## COMPLETE VIEW

Test information subject to change
Available Stat: No
Test Code: CNXN30
Performing Lab: Stanford Hospital Clinical Laboratory
Sendout: Yes
Methodology: PCR
Remarks: Patient insurance billing information MUST accompany test request when specimen is collected. Patient will be billed by Stanford Clinical Laboratory. (requires 7 mL whole blood, minimum: 3 mL) Stanford TRF: Click here for Stanford Test Request Form
Collect: Lavender top
Amount to Collect: 2 mL blood
Sample Type: EDTA whole blood
Preferred Volume: 2 mL
Minimum Volume: 0.5 mL
Specimen Preparation: Do not centrifuge the specimen. Store at room temperature. Send to Stanford, order thier test code CX30.
Synonyms: Nonsyndromic Deafness
Reported: 7-14 days
CPT Codes: 83891-90, 83894-90, 83898-90, 83912-90
Coombs, Direct, Polyspecific
DCT

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Blood Banks
Performed: Test available 24 hours per day 7 days per week
Reported: 4 hours
Additional Information: If the polyspecific test is positive, a monospecific assay will automatically be initiated at an additional charge to further evaluate the problem, except in neonates, in whom it may be assumed a positive test represents IgG coating of RBCs.
Reflex Testing: If positive specific testing to determine if the reactivity is due to Complement or IgG is automatically performed.
Synonyms:
  • DAT
  • Direct antiglobulin test
  • direct coombs
  • cord blood tests

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top (6 mL size preferred)
Amount to Collect: 6 mL blood
Preferred Volume: 6 mL blood
Minimum Volume: 3 mL blood
Unacceptable Conditions: Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code: DCT
Test Group: Coombs
Performing Lab: Parnassus & Mission Bay Blood Banks
Preferred Volume: 6 mL blood
Minimum Volume: 3 mL blood
Unacceptable Conditions: Unsigned, mislabeled, unlabeled or hemolyzed sample.
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
If the polyspecific test is positive, a monospecific assay will automatically be initiated at an additional charge to further evaluate the problem, except in neonates, in whom it may be assumed a positive test represents IgG coating of RBCs.

ADMINISTRATIVE

CPT Codes:
86880
LOINC Codes:
51871-2

COMPLETE VIEW

Available Stat:
No
Test Code:
DCT
Test Group:
Coombs
Performing Lab:
Parnassus & Mission Bay Blood Banks
Performed:
Test available 24 hours per day 7 days per week
Collect:
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL blood
Sample Type:
EDTA whole blood
Preferred Volume:
6 mL blood
Minimum Volume:
3 mL blood
Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.
Reference Interval:
Negative
Synonyms:
• DAT
• Direct antiglobulin test
• direct coombs
• cord blood tests
Reported:
4 hours
Reflex Testing:
If positive specific testing to determine if the reactivity is due to Complement or IgG is automatically performed.
Additional Information:
If the polyspecific test is positive, a monospecific assay will automatically be initiated at an additional charge to further evaluate the problem, except in neonates, in whom it may be assumed a positive test represents IgG coating of RBCs.
CPT Codes:
  86880
LOINC Codes:
  51871-2
Coombs, Indirect
ICT

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Blood Banks
Performed: Test available 24 hours per day 7 days per week
Reported: STAT 1 hour, ASAP 2 hours, Routine 4 hours
Additional Information: If the test is positive, Antibody Identification will automatically be initiated at an additional charge to determine whether the result is due to an auto- or alloantibody.
Synonyms:
- Indirect coombs
- cord blood tests

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top (6 mL size preferred)
Amount to Collect: 6 mL blood
Preferred Volume: 6 mL blood
Minimum Volume: 3 mL blood
Remarks: Use BLOOD BANK requisition.
Unacceptable Conditions: Unsigned, mislabeled or unlabeled sample

PROCESSING

Test Code: ICT
Test Group: Coombs
Performing Lab: Parnassus & Mission Bay Blood Banks
Preferred Volume: 6 mL blood
Minimum Volume: 3 mL blood
Unacceptable Conditions: Unsigned, mislabeled or unlabeled sample

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Reference Interval:
Negative

Additional Information:
If the test is positive, Antibody Identification will automatically be initiated at an additional charge to determine whether the result is due to an auto- or alloantibody.

ADMINISTRATIVE

CPT Codes:
86885
LOINC Codes:
1008-2

COMPLETE VIEW

Available Stat:
Yes

Test Code:
ICT

Test Group:
Coombs

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test available 24 hours per day 7 days per week

Remarks:
Use BLOOD BANK requisition.

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Reference Interval:
Negative

Synonyms:
- Indirect coombs
- cord blood tests

Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Additional Information:
If the test is positive, Antibody Identification will automatically be initiated at an additional charge to determine whether the result is due to an auto- or alloantibody.

CPT Codes:
86885

LOINC Codes:
1008-2

Printed 06/07/19
Test information subject to change
Cooximetry
CPCOOX, ABGCOX, VBGCOX, MVBGCX, CVBGX

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus Chemistry and Mission Bay Blood Gas Laboratory
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Radiometer ABL 800
Reported:
10 minutes
Additional Information:
Heparin syringes and caps to replace the needles during transport to the laboratory are available from Materiel Services.

Synonyms:
- Hemoximetry
- Methemoglobinemia
- Oxyhemoglobin
- Carboxyhemoglobin
- Deoxyhemoglobin
- CPCOOX
- ABGCOX
- VBGCOX
- MVBGCX
- CVBGX

COLLECTION

Sample Type:
Heparinized whole blood (Blood gas syringe or capillary tube)
Collect:
Plastic syringe containing 100 U of dry heparin or Capillary Tube with 70 IU/ml dry electrolyte-balanced heparin
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood
Minimum Volume:
0.5 mL blood
Remarks:
Heparin syringes and caps to replace the needles during transport to the laboratory are available from Materiel Services.

Specimens (excluding capillary collections) should be sent at ambient temperature via pneumatic tube to Blood Gas Lab, Parnassus Chemistry station #151, Mission Bay station #21, within 30 minutes of collection.

Capillary Samples:
1. The following are recommended sampling sites: earlobe, fingertip, big toe, heel. The heel and big toe are more suitable for use on neonates and infants.
2. Warm the area or puncture site for 5 to 10 minutes prior to actual sampling. This accelerates flow for blood to be representative of general status of patient.
3. Make a puncture using a lancet or similar device. Do not squeeze the area to avoid tissue juice from mixing into blood sample.
4. Wipe off the first drop of blood. Take the sample from the center of the second drop of blood and hold the capillary at a slightly downward angle for an uninterrupted blood flow. Avoid getting air bubbles in the specimen.
5. Refrain from squeezing or milking the puncture site as this may result in faulty measurements or cause hemolysis of blood sample and cause elevated K⁺ readings.
6. Apply accompanying caps to both ends of the capillary tube and mix the sample with the heparin immediately after collection to prevent blood from clotting. The manufacturer recommends the use of a mixing wire and magnet for capillary samples.
7. Label sample with patient's name, ID and DOB. Hand deliver all capillary samples to the Blood Gas Lab immediately (within 10 minutes) after collection. Send samples to Parnassus Chemistry 5th floor Long hospital room L568, MB Blood Gas Lab is in the Children's Hospital, 3rd floor, RM C3636

**Stability (from collection to initiation):**

- 30 minutes

**Unacceptable Conditions:**

- Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

---

**PROCESSING**

**Test Code:**

- CPCOOX (Cooximetry from Capillary source)

**Blood Gas with Cooximetry:**

- ABGCOX (Blood Gas and Cooximetry from Arterial source)
- VBGCOX (Blood Gas and Cooximetry from Venous source)
- MVBGCX (Blood Gas and Cooximetry from Mixed Venous source)
- CVBGX (Blood Gas and Cooximetry from Central Venous source)

**Performing Lab:**

- Parnassus Chemistry and Mission Bay Blood Gas Laboratory

**Preferred Volume:**

- 1 mL blood

**Minimum Volume:**

- 0.5 mL blood

**Unacceptable Conditions:**

- Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

**Stability (from collection to initiation):**

- 30 minutes

---

**RESULT INTERPRETATION**

**Units:**

- %

**Reference Interval:**

- Hemoglobin: see Hemoglobin entry
- Oxyhemoglobin: 93-100%
- Carboxyhemoglobin: 0.5-1.5%
- Methemoglobin: 0.0-1.5%
- Art. O₂ content: 16-22 vol%

**Critical Values:**

- Carboxyhemoglobin: >= 5%
- Methemoglobin: >= 2%

**Additional Information:**

- Heparin syringes and caps to replace the needles during transport to the laboratory are available from Materiel Services.

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**ADMINISTRATIVE**

**LOINC Codes:**

- 11559-2
Available Stat:
Yes

Test Code:
CPCOOX (Cooximetry from Capillary source)

Blood Gas with Cooximetry:
ABGCOX (Blood Gas and Cooximetry from Arterial source)
VBGCOX (Blood Gas and Cooximetry from Venous source)
MVBGCX (Blood Gas and Cooximetry from Mixed Venous source)
CVBGX (Blood Gas and Cooximetry from Central Venous source)

Performing Lab:
Parnassus Chemistry and Mission Bay Blood Gas Laboratory

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Radiometer ABL 800

Remarks:
Heparin syringes and caps to replace the needles during transport to the laboratory are available from Materiel Services.

Specimens (excluding capillary collections) should be sent at ambient temperature via pneumatic tube to Blood Gas Lab, Parnassus Chemistry station #151, Mission Bay station #21, within 30 minutes of collection.

Capillary Samples:
1. The following are recommended sampling sites: earlobe, fingertip, big toe, heel. The heel and big toe are more suitable for use on neonates and infants.
2. Warm the area or puncture site for 5 to 10 minutes prior to actual sampling. This accelerates flow for blood to be representative of general status of patient.
3. Make a puncture using a lancet or similar device. Do not squeeze the area to avoid tissue juice from mixing into blood sample.
4. Wipe off the first drop of blood. Take the sample from the center of the second drop of blood and hold the capillary at a slightly downward angle for an uninterrupted blood flow. Avoid getting air bubbles in the specimen.
5. Refrain from squeezing or milking the puncture site as this may result in faulty measurements or cause hemolysis of blood sample and cause elevated K+ readings.
6. Apply accompanying caps to both ends of the capillary tube and mix the sample with the heparin immediately after collection to prevent blood from clotting. The manufacturer recommends the use of a mixing wire and magnet for capillary samples.
7. Label sample with patient's name, ID and DOB. Hand deliver all capillary samples to the Blood Gas Lab immediately (within 10 minutes) after collection. Send samples to Parnassus Chemistry 5th floor Long hospital room L568, MB Blood Gas Lab is in the Children's Hospital, 3rd floor, RM C3636

Collect:
Plastic syringe containing 100 U of dry heparin or Capillary Tube with 70 IU/ml dry electrolyte-balanced heparin

Amount to Collect:
1 mL blood

Sample Type:
Heparinized whole blood (Blood gas syringe or capillary tube)

Preferred Volume:
1 mL blood

Minimum Volume:
0.5 mL blood

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

Units:
%

Reference Interval:
Hemoglobin: see Hemoglobin entry
Oxyhemoglobin: 93-100%
Carboxyhemoglobin: 0.5-1.5%
Methemoglobin: 0.0-1.5%
Art. O₂ content: 16-22 vol%  
**Critical Values:**  
Carboxyhemoglobin: >= 5%  
Methemoglobin: >= 2%  
**Synonyms:**  
- Hemoximetry  
- Methemoglobinemia  
- Oxyhemoglobin  
- Carboxyhemoglobin  
- Deoxyhemoglobin  
- CPCOOX  
- ABGCOX  
- VBGCOX  
- MVBGCX  
- CVBGX  
**Stability (from collection to initiation):**  
30 minutes  
**Reported:**  
10 minutes  
**Additional Information:**  
Heparin syringes and caps to replace the needles during transport to the laboratory are available from Materiel Services.  
**LOINC Codes:**  
11559-2
Copper, 24 hour urine
COPU

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: ICP/MS
Reported: Test run Tuesday-Saturday. Turnaround time: 2-5 days.
Additional Information: To convert μg/L to μmol/L (SI units), multiply by 0.0157.

Levels are high in most symptomatic patients but false-positive results can occur in obstructive liver disease.

Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

Synonyms: • Cu • Wilson's disease • Menke's disease

COLLECTION

Sample Type: 24 hour urine collection
Collect: Acid washed 24 hour urine collection container
Amount to Collect: Entire 24 hour urine output
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Stability (from collection to initiation): Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.
Rejection Criteria: Hemolysis or fecal contamination.

PROCESSING

Test Code: COPU
Test Group: Copper
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis.

Record total volume of urine received and write on request. Be sure the urine is mixed well before transferring to the shipping container. To avoid contamination, carefully pour the designated amount of urine directly from the collection container into the acid wash shipping container.

Prepare two (2) aliquots, save (1) for storage, discard after 1 week. Refrigerate aliquots.

For 24 hour urine Order Quest # 365. For random urine order Quest # 86579N

**Preferred Volume:**
- 7 mL urine

**Minimum Volume:**
- 3 mL urine

**Rejection Criteria:**
- Hemolysis or fecal contamination.

**Stability (from collection to initiation):**
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

**RESULT INTERPRETATION**

**Units:**
- µg/24 hours

**Reference Interval:**
- 15-60 µg/24 hours

**Additional Information:**
- To convert µg/L to µmol/L (SI units), multiply by 0.0157.

- Levels are high in most symptomatic patients but false-positive results can occur in obstructive liver disease.

- Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

**ADMINISTRATIVE**

**CPT Codes:**
- 82525-90

**LOINC Codes:**
- 5633-3

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- COPU

**Test Group:**
- Copper

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- ICP/MS

**Collect:**
- Acid washed 24 hour urine collection container

**Amount to Collect:**
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
7 mL urine

Minimum Volume:
3 mL urine

Rejection Criteria:
Hemolysis or fecal contamination.

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis.

Record total volume of urine received and write on request. Be sure the urine is mixed well before transferring to the shipping container. To avoid contamination, carefully pour the designated amount of urine directly from the collection container into the acid wash shipping container.

Prepare two (2) aliquots, save (1) for storage, discard after 1 week. Refrigerate aliquots.

For 24 hour urine Order Quest # 365. For random urine order Quest # 86579N

Units:
µg/24 hours

Reference Interval:
15-60 µg/24 hours

Synonyms:
- Cu
- Wilson's disease
- Menke's disease

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:
Test run Tuesday-Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/L to µmol/L (SI units), multiply by 0.0157.

Levels are high in most symptomatic patients but false-positive results can occur in obstructive liver disease.

Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

CPT Codes:
82525-90

LOINC Codes:
5633-3
Copper, plasma
COP

ORDERING

Available Stat:
No
Performing Lab:
UC Irvine
Methodology:
ICP/MS
Reported:
Test run Monday-Friday. Turnaround time: 2-6 days.
Additional Information:
To convert µg/L to µmol/L (SI units), multiply by 0.0157.
Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.
Synonyms:
- Cu
- Wilson's disease
- Menke's disease

COLLECTION

Patient Preparation:
The patient should refrain from taking vitamins or mineral supplements for at least one week prior to specimen collection.
Sample Type:
EDTA Plasma
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
5 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.6 mL plasma
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen 6 months.
Unacceptable Conditions:
Hemolyzed samples

PROCESSING

Test Code:
COP
Test Group:
Copper
Sendout:
Yes
Performing Lab:
UC Irvine
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis.

Centrifuge and separate plasma from cells within 6 hours of collection.

Pour to transfer plasma into screw-capped trace element container and ship frozen. Do NOT use a glass pipette.

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.6 mL plasma

**Unacceptable Conditions:**
- Hemolyzed samples

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 2 weeks, frozen 6 months.

### RESULT INTERPRETATION

**Units:**
- µg/dL (mcg/dL)

**Reference Interval:**
- 0-2 years: 12-67 µg/dL
- 3-10 years: 27-153 µg/dL
- Adult males: 70-140 µg/dL
- Adult females: 85-155 µg/dL

**Additional Information:**
- To convert µg/L to µmol/L (SI units), multiply by 0.0157.

Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

### ADMINISTRATIVE

**CPT Codes:**
- 82525-90

**LOINC Codes:**
- 5631-7

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- COP

**Test Group:**
- Copper

**Performing Lab:**
- UC Irvine

**Sendout:**
- Yes

**Methodology:**
- ICP/MS

**Patient Preparation:**
- The patient should refrain from taking vitamins or mineral supplements for at least one week prior to specimen collection.

**Collect:**
- Navy blue top (EDTA) tube

**Amount to Collect:**
5 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.6 mL plasma

Unacceptable Conditions:
Hemolyzed samples

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis.

Centrifuge and separate plasma from cells within 6 hours of collection.

Pour to transfer plasma into screw-capped trace element container and ship frozen. Do NOT use a glass pipette.

Units:
µg/dL (mcg/dL)

Reference Interval:
0-2 years: 12-67 µg/dL
3-10 years: 27-153 µg/dL
Adult males: 70-140 µg/dL
Adult females: 85-155 µg/dL

Synonyms:
- Cu
- Wilson's disease
- Menke's disease

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen 6 months.

Reported:
Test run Monday-Friday. Turnaround time: 2-6 days.

Additional Information:
To convert µg/L to µmol/L (SI units), multiply by 0.0157.

Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

CPT Codes:
82525-90

LOINC Codes:
5631-7
Copper, random urine

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Inductively Coupled Plasma Mass Spectrometry
Reported: Set up 5x per week. Turnaround 4-8 days.
Additional Information: Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.
Synonyms: • Cu • Wilson's disease • Menke's disease

COLLECTION

Patient Preparation: Patient should refrain from taking vitamins, mineral or herbal supplements at least one week prior to specimen collection.
Sample Type: Second void (preferred) or random urine
Collect: Urine cup
Amount to Collect: 20 mL
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Stability (from collection to initiation): Room temperature 5 days, refrigerated 5 days, frozen at -20C 2 weeks.

PROCESSING

Test Code: COPUR
Test Group: Copper
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Freeze aliquot at -20C. Order Quest # 86579N
Preferred Volume: 7 mL urine
Minimum Volume:
3 mL urine

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 5 days, frozen at -20°C 2 weeks.

RESULT INTERPRETATION

Units:
µg/g Creatinine (mcg/g Creatinine)

Reference Interval:
Normals based on second void AM urine:
Males: 6.4-14.3 µg/g creatinine
Females: 6.7-18.6 µg/g creatinine

Additional Information:
Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

ADMINISTRATIVE

CPT Codes:
82525-90, 82570-90
LOINC Codes:
13829-7

COMPLETE VIEW

Available Stat:
No
Test Code:
COPUR
Test Group:
Copper
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Inductively Coupled Plasma Mass Spectrometry

Patient Preparation:
Patient should refrain from taking vitamins, mineral or herbal supplements at least one week prior to specimen collection.

Collect:
Urine cup

Amount to Collect:
20 mL

Sample Type:
Second void (preferred) or random urine

Preferred Volume:
7 mL urine

Minimum Volume:
3 mL urine

Specimen Preparation:
Freeze aliquot at -20°C. Order Quest # 86579N

Units:
µg/g Creatinine (mcg/g Creatinine)
Reference Interval:
Normals based on second void AM urine:
Males: 6.4-14.3 µg/g creatinine
Females: 6.7-18.6 µg/g creatinine

Synonyms:
- Cu
- Wilson's disease
- Menke's disease

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 5 days, frozen at -20°C 2 weeks.

Reported:
Set up 5x per week. Turnaround 4-8 days.

Additional Information:
Copper is an essential element that is a cofactor of many enzymes. Copper metabolism is disturbed in Wilson's disease, Menkes disease, primary biliary cirrhosis, and Indian childhood cirrhosis. Urinary copper concentrations are also useful to monitor patients on chelation therapy.

CPT Codes:
82525-90, 82570-90

LOINC Codes:
13829-7
Copper, tissue
COPT

ORDERING

Available Stat:  No
Performing Lab:  Mayo
Methodology:  ICP/MS
Reported:  2 weeks
Additional Information:  In Wilson's disease levels are usually 200-3000 µg/g, and carriers may have levels up to 150 µg/g, but false-positive results can occur in obstructive liver disease.
Synonyms:  
  • Cu
  • Wilson's disease
  • Menke's disease

COLLECTION

Sample Type:  Unfixed Liver tissue. Paraffin block is also acceptable if not more than 1 or 2 cuts have been made to it for slides. Paraffin blocks will be returned in 2 weeks unless a request for an earlier return is made.
Collect:  Trace metal-free vial (blue label)
Amount to Collect:  4 mL
Preferred Volume:  0.5 x 5 mm
Minimum Volume:  0.5 x 2.0 mm
Remarks:  Obtain trace metal-free vial (blue label) supplied by vendor and available from Specimen Receiving. Paraffin block is also acceptable if not more than 1 or 2 cuts have been made to it for slides. Paraffin blocks will be returned in 2 weeks unless a request for an earlier return is made.

PROCESSING

Test Code:  COPT
Test Group:  Copper
Sendout:  Yes
Performing Lab:  Mayo
Specimen Preparation:  Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Order MAYO# 8687. Place packaged specimen in refrigerator bin for MCS pickup.
Preferred Volume:  0.5 x 5 mm
RESULT INTERPRETATION

Units:  μg/g dry weight of liver

Reference Interval:  10-35 μg/g dry weight of liver

Additional Information:  In Wilson's disease levels are usually 200-3000 μg/g, and carriers may have levels up to 150 μg/g, but false-positive results can occur in obstructive liver disease.

ADMINISTRATIVE

CPT Codes:  82525-90

LOINC Codes:  8198-4

COMPLETE VIEW

Available Stat:  No

Test Code:  COPT

Test Group:  Copper

Performing Lab:  Mayo

Sendout:  Yes

Methodology:  ICP/MS

Remarks:  Obtain trace metal-free vial (blue label) supplied by vendor and available from Specimen Receiving. Paraffin block is also acceptable if not more than 1 or 2 cuts have been made to it for slides. Paraffin blocks will be returned in 2 weeks unless a request for an earlier return is made.

Collect:  Trace metal-free vial (blue label)

Amount to Collect:  4 mL

Sample Type:  Unfixed Liver tissue Paraffin block is also acceptable if not more than 1 or 2 cuts have been made to it for slides. Paraffin blocks will be returned in 2 weeks unless a request for an earlier return is made.

Preferred Volume:  0.5 x 5 mm

Minimum Volume:  0.5 x 2.0 mm

Specimen Preparation:  Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Order MAYO# 8687. Place packaged specimen in refrigerator bin for MCS pickup.

Units:  μg/g dry weight of liver

Reference Interval:  

Printed 06/07/19
Test information subject to change
10-35 µg/g dry weight of liver

**Synonyms:**
- Cu
- Wilson's disease
- Menke's disease

**Reported:**
2 weeks

**Additional Information:**
In Wilson's disease levels are usually 200-3000 µg/g, and carriers may have levels up to 150 µg/g, but false-positive results can occur in obstructive liver disease.

**CPT Codes:**
82525-90

**LOINC Codes:**
8198-4
Cortisol, free, serum
CRTFS

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
3-5 days
Additional Information:
Free cortisol is useful in the detection of patients with Cushing's syndrome for whom free cortisol concentrations are elevated.

Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing
- Unconjugated cortisol
- Cortisol, unconjugated
- Unconjugated F
- Unconjugated hydroxycorticoids

COLLECTION

Sample Type:
Serum or EDTA plasma
Collect:
Red top or Lavender top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum or plasma
Minimum Volume:
0.7 mL serum or plasma
Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 1 week, frozen 2 years

PROCESSING

Test Code:
CRTFS
Test Group:
Cortisol
Sendout:
Yes
Performing Lab:
**Quest**

**Specimen Preparation:**
Aliquot and freeze. Transport to CB frozen. Order Quest test code 21469P.

**Preferred Volume:**
2 mL serum or plasma

**Minimum Volume:**
0.7 mL serum or plasma

**Stability (from collection to initiation):**
Room temperature 4 hours, refrigerated 1 week, frozen 2 years

---

**RESULT INTERPRETATION**

**Units:**
µg/dL

**Reference Interval:**
**Adult:**
8:00 A.M.-10:00 A.M.: 0.07-0.93 µg/dL
4:00 P.M.-6:00 P.M.: 0.04-0.45 µg/dL
10:00 P.M.-11:00 P.M.: 0.04-0.35 µg/dL

**Additional Information:**
Free cortisol is useful in the detection of patients with Cushing's syndrome for whom free cortisol concentrations are elevated.

---

**ADMINISTRATIVE**

**CPT Codes:**
82530-90

---

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
CRTFS

**Test Group:**
Cortisol

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
LC/MS/MS

**Collect:**
Red top or Lavender top

**Amount to Collect:**
4 mL blood

**Sample Type:**
Serum or EDTA plasma

**Preferred Volume:**
2 mL serum or plasma

**Minimum Volume:**
0.7 mL serum or plasma

**Specimen Preparation:**
Aliquot and freeze. Transport to CB frozen. Order Quest test code 21469P.

**Units:**
µg/dL
Reference Interval:

Adult:
8:00 A.M.-10:00 A.M.: 0.07-0.93 µg/dL
4:00 P.M.-6:00 P.M.: 0.04-0.45 µg/dL
10:00 P.M.-11:00 P.M.: 0.04-0.35 µg/dL

Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing
- Unconjugated cortisol
- Cortisol, unconjugated
- Unconjugated F
- Unconjugated hydroxycorticoids

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 1 week, frozen 2 years

Reported:
3-5 days

Additional Information:
Free cortisol is useful in the detection of patients with Cushing's syndrome for whom free cortisol concentrations are elevated.

CPT Codes:
82530-90
Cortisol, saliva
CRTSV

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
3-5 days
Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing

COLLECTION

Patient Preparation:
1. Saliva should be collected at the time(s) prescribed by your doctor.
2. No food or fluids for 30 minutes prior to collection.
3. Do not use any creams, lotions, or steroid inhalers immediately prior to collection.
4. Avoid any activity that can cause your gums to bleed, including brushing and flossing your teeth. Consult with your doctor if this is a chronic problem.
5. Do not use this kit on children under 3 years of age or any patient with increased risk of swallowing or choking

Sample Type:
saliva
Collect:
Salivette collection tube
Amount to Collect:
0.5 mL
Preferred Volume:
0.5 mL
Minimum Volume:
0.2 mL
Remarks:
1. Rinse mouth thoroughly with water and discard. Do not swallow.
2. Hold the Salivette® at the rim of the suspended insert and remove the stopper.
3. Remove the swab.
4. Place the swab under the tongue until well saturated, approximately 1 minute.
5. Return the saturated swab to the suspended insert and close the Salivette® firmly with the stopper.
6. Do not remove the tube holding the insert. The Salivette® should be sent to the lab with the swab inside.
7. Label the Salivette® with the patient name, date and time of collection, and any other identifying information.

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen 2 years.

Rejection Criteria:
Use of any collection container other than Salivette tube
Test Code: CRTSV
Test Group: Cortisol
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
  Freeze sample and send frozen to CB. order Quest test code 19897X
Preferred Volume:
  0.5 mL
Minimum Volume:
  0.2 mL
Rejection Criteria:
  Use of any collection container other than Salivette tube
Stability (from collection to initiation):
  Room temperature 5 days, refrigerated 1 week, frozen 2 years.

RESULT INTERPRETATION

Units:
  µg/dL (mcg/dL)
Reference Interval:
  8-10 AM: 0.04-0.56 µg/dL
  4-6 PM: <= 0.15 µg/dL
  10-11 PM: <= 0.09 µg/dL

ADMINISTRATIVE

CPT Codes:
  82530-90
LOINC Codes:
  2142-8

COMPLETE VIEW

Available Stat:
  No
Test Code: CRTSV
Test Group: Cortisol
Performing Lab: Quest
Sendout: Yes
Methodology:
  LC/MS/MS
Patient Preparation:
  1. Saliva should be collected at the time(s) prescribed by your doctor.
  2. No food or fluids for 30 minutes prior to collection.
  3. Do not use any creams, lotions, or steroid inhalers immediately prior to collection.
  4. Avoid any activity that can cause your gums to bleed, including brushing and flossing your teeth. Consult with your doctor if this is a
chronic problem.
5. Do not use this kit on children under 3 years of age or any patient with increased risk of swallowing or choking

Remarks:
1. Rinse mouth thoroughly with water and discard. Do not swallow.
2. Hold the Salivette® at the rim of the suspended insert and remove the stopper.
3. Remove the swab.
4. Place the swab under the tongue until well saturated, approximately 1 minute.
5. Return the saturated swab to the suspended insert and close the Salivette® firmly with the stopper.
6. Do not remove the tube holding the insert. The Salivette® should be sent to the lab with the swab inside.
7. Label the Salivette® with the patient name, date and time of collection, and any other identifying information.

Collect:
Salivette collection tube

Amount to Collect:
0.5 mL

Sample Type:
saliva

Preferred Volume:
0.5 mL

Minimum Volume:
0.2 mL

Rejection Criteria:
Use of any collection container other than Salivette tube

Specimen Preparation:
Freeze sample and send frozen to CB. order Quest test code 19897X

Units:
µg/dL (mcg/dL)

Reference Interval:
8-10 AM: 0.04-0.56 µg/dL
4-6 PM: <= 0.15 µg/dL
10-11 PM: <= 0.09 µg/dL

Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen 2 years.

Reported:
3-5 days

CPT Codes:
82530-90

LOINC Codes:
2142-8
ORDERING

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Test available on day shift, 7 days per week.

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i1000)

Reported:
1-3 days

Additional Information:

The specificity of the ARCHITECT Cortisol assay was determined by studying the cross-reactivity of compounds whose chemical structure or concurrent usage may potentially interfere with the ARCHITECT Cortisol assay. Specificity of the assay was determined by spiking each compound into human serum specimens with cortisol levels of 11.4 and 12.0 µg/dL. Cross reactivity results with other steroids are listed below.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Conc (µg/dL)</th>
<th>% Cross-Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldosterone</td>
<td>1000</td>
<td>0.0</td>
</tr>
<tr>
<td>Beclomethasone</td>
<td>1000</td>
<td>0.0</td>
</tr>
<tr>
<td>Budesonide</td>
<td>1000</td>
<td>0.0</td>
</tr>
<tr>
<td>Canrenone</td>
<td>1000</td>
<td>0.1</td>
</tr>
<tr>
<td>Corticosterone</td>
<td>1000</td>
<td>0.9</td>
</tr>
<tr>
<td>Cortisol 21-glucuronide</td>
<td>1000</td>
<td>0.2</td>
</tr>
<tr>
<td>Cortisone</td>
<td>1000</td>
<td>2.7</td>
</tr>
<tr>
<td>B-Cortol</td>
<td>1000</td>
<td>0.0</td>
</tr>
<tr>
<td>B-Cortolone</td>
<td>1000</td>
<td>0.0</td>
</tr>
<tr>
<td>11-Deoxycorticosterone</td>
<td>100</td>
<td>0.0</td>
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<tr>
<td>11-Deoxycortisol</td>
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<td>Dexamethasone</td>
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<tr>
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<tr>
<td>Fluticasone Propionate</td>
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</tr>
<tr>
<td>6B-Hydroxycortisol</td>
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</tr>
<tr>
<td>17a-Hydroxyprogrenolone</td>
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<td>0.1</td>
</tr>
<tr>
<td>11B-Hydroxyprogesterone</td>
<td>1000</td>
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<tr>
<td>17-Hydroxyprogesterone</td>
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<tr>
<td>Medroxyprogesterone Acetate</td>
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<tr>
<td>Prednisolone</td>
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<td>Prednisone</td>
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<tr>
<td>Pregnantriol</td>
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<td>0.0</td>
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<td>Pregnenolone</td>
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<td>0.0</td>
</tr>
<tr>
<td>Progesterone</td>
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<tr>
<td>B-Sitosterol</td>
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<td>0.0</td>
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<tr>
<td>Spironolactone</td>
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<td>0.0</td>
</tr>
<tr>
<td>Testosterone</td>
<td>1000</td>
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</tr>
</tbody>
</table>
Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing

**COLLECTION**

Sample Type: Serum
Collect:
- Preferred: Gold top or Red top; Acceptable: Green Top (Sodium/Lithium Heparin)

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Remarks:**
- A morning sample is usually recommended.

**Unacceptable Conditions:**
- Samples will not be rejected based on time of collection.

**PROCESSING**

**Test Code:**
- CORT

**Test Group:**
- Cortisol

**Performing Lab:**
- China Basin Chemistry

**Specimen Preparation:**
- Refrigerate

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Unacceptable Conditions:**
- Samples will not be rejected based on time of collection.

**RESULT INTERPRETATION**

**Units:**
- µg/dL

**Reference Interval:**
- Adult Reference Range (µg/dL)
  - AM (before 10am): 4 - 19
  - PM (after 5pm): 3 - 17

Reference range adopted from vendor performed studies and verified by running lab personnel.
Pediatric Reference Range (ug/dL)
2 - 14 days: 0.5 - 12
15 days - < 1 year: 0.5 - 17
1 year - < 9 years: 2 - 11
9 - < 14 years: 2 - 13
14 - < 17 years: 3 - 16
17 years - < 19 years: 4 - 18

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay. Morning samples gave results approximately 10% higher than afternoon samples.


Additional Information:

The specificity of the ARCHITECT Cortisol assay was determined by studying the cross-reactivity of compounds whose chemical structure or concurrent usage may potentially interfere with the ARCHITECT Cortisol assay. Specificity of the assay was determined by spiking each compound into human serum specimens with cortisol levels of 11.4 and 12.0 µg/dL. Cross reactivity results with other steroids are listed below.

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<td>11-Deoxycorticosterone</td>
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<td>Dexamethasone</td>
<td>1000</td>
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<tr>
<td>B-Estradiol</td>
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</tr>
<tr>
<td>Estriol</td>
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<td>0.0</td>
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<td>Estrone</td>
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</tr>
<tr>
<td>Testosterone</td>
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<td>0.0</td>
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</table>

CPT Codes:
82533
LOINC Codes:
2143-6

COMPLETE VIEW

Available Stat:
No

Test Code:
CORT

Test Group:
Cortisol

Performing Lab:
China Basin Chemistry

Performed:
Test available on day shift, 7 days per week.

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i1000)

Remarks:
A morning sample is usually recommended.

Collect:
Preferred: Gold top or Red top; Acceptable: Green Top (Sodium/Lithium Heparin)

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Samples will not be rejected based on time of collection.

Specimen Preparation:
Refrigerate

Units:
µg/dL

Reference Interval:
Adult Reference Range (ug/dL)
AM (before 10am): 4 - 19
PM (after 5pm): 3 - 17

Reference range adopted from vendor performed studies and verified by running lab personnel.

Pediatric Reference Range (ug/dL)
2 - 14 days: 0.5 - 12
15 days - < 1 year: 0.5 - 17
1 year - < 9 years: 2 - 11
9 - < 14 years: 2 - 13
14 - < 17 years: 3 - 16
17 years - < 19 years: 4 - 18

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay. Morning samples gave results approximately 10% higher than afternoon samples.


Synonyms:
- Compound F
- 11-hydroxycorticosteroids
- 11-hydroxycorticoids
- 11-OH steroids
- 11-OH corticosteroids
- Cosyntropin provocative testing

**Reported:**
1-3 days

**Additional Information:**

The specificity of the ARCHITECT Cortisol assay was determined by studying the cross-reactivity of compounds whose chemical structure or concurrent usage may potentially interfere with the ARCHITECT Cortisol assay. Specificity of the assay was determined by spiking each compound into human serum specimens with cortisol levels of 11.4 and 12.0 µg/dL. Cross reactivity results with other steroids are listed below.

<table>
<thead>
<tr>
<th>Compound</th>
<th>Conc (µg/dL)</th>
<th>% Cross-Reactivity</th>
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</thead>
<tbody>
<tr>
<td>Aldosterone</td>
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<tr>
<td>Budesonide</td>
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<tr>
<td>Canrenone</td>
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<td>Corticosterone</td>
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<tr>
<td>Cortisol 21-glucuronide</td>
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<tr>
<td>Cortisone</td>
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<tr>
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<td>0.2</td>
</tr>
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<td>17a-Hydroxypregnenolone</td>
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<td>0.1</td>
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<tr>
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<tr>
<td>Testosterone</td>
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</tbody>
</table>

**CPT Codes:**
82533

**LOINC Codes:**
2143-6
Cortisol, Unconjugated, urine
CRTF

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Tandem Mass Spectrometry
Reported:
Test performed Monday-Saturday. Turnaround time: 2-5 days.
Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 2.76.
Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.
Because of cyclical excretion and problems with urine collection, it is recommended that assays be repeated on at least two consecutive 24 hour samples: "normalization" of excretion per gram of urinary creatinine cannot correct for incomplete collection (Orth, DN. NewEngl J Med. 1995; 332:791).
Synonyms:
• Free cortisol
• Cortisol, free
• Free F
• Free hydroxycorticoids

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
2 mL urine
Minimum Volume:
0.5 mL urine
Remarks:
Obtain container from Specimen Receiving. Report any medications that the patient is taking.

PROCESSING

Test Code:
CRTF
Test Group:
Cortisol
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze aliquot from well mixed collection at -20C. Include any information regarding medication the patient is taking. Order Quest #11280X.

Preferred Volume:
2 mL urine

Minimum Volume:
0.5 mL urine

RESULT INTERPRETATION

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:
<1 year old: Not established
1-4 years old: 0.9-8.2 µg/24 hours
5-9 years old: 1.0-30.0 µg/24 hours
10-13 years old: 1.0-45.0 µg/24 hours
14-17 years old: 3.0-55.0 µg/24 hours
>= 18 years old: 4.0-50.0 ug/24 hours

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 2.76.

Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

Because of cyclical excretion and problems with urine collection, it is recommended that assays be repeated on at least two consecutive 24 hour samples: "normalization" of excretion per gram of urinary creatinine cannot correct for incomplete collection (Orth, DN. NewEnglJ Med. 1995; 332:791).

ADMINISTRATIVE

CPT Codes:
82530-90

LOINC Codes:
2147-7

COMPLETE VIEW

Available Stat:
No

Test Code:
CRTF

Test Group:
Cortisol

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Tandem Mass Spectrometry

Remarks:
Obtain container from Specimen Receiving. Report any medications that the patient is taking.

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output
Sample Type:
24 hour urine collection

Preferred Volume:
2 mL urine

Minimum Volume:
0.5 mL urine

Specimen Preparation:
Freeze aliquot from well mixed collection at -20°C. Include any information regarding medication the patient is taking. Order Quest # 11280X.

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:
<1 year old: Not established
1-4 years old: 0.9-8.2 µg/24 hours
5-9 years old: 1.0-30.0 µg/24 hours
10-13 years old: 1.0-45.0 µg/24 hours
14-17 years old: 3.0-55.0 µg/24 hours
>= 18 years old: 4.0-50.0 µg/24 hours

Synonyms:
- Free cortisol
- Cortisol, free
- Free F
- Free hydroxycorticoids

Reported:
Test performed Monday-Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 2.76.

Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

Because of cyclical excretion and problems with urine collection, it is recommended that assays be repeated on at least two consecutive 24 hour samples: "normalization" of excretion per gram of urinary creatinine cannot correct for incomplete collection (Orth, DN. New Engl J Med. 1995; 332:791).

CPT Codes:
82530-90

LOINC Codes:
2147-7
Cortison, 24 Hour Urine
CRTN

ORDERING

Performing Lab:
Quest
Performed:
Mon-Fri
Methodology:
LC/MS/MS
Reported:
2-6 days
Additional Information:
Measurement of both Free Cortisol and Cortisone are useful in diagnosing patients with low-renin hypertension caused by apparent mineralocorticoid excess. This may be due to either an inherited defect in 11HSDB2 enzyme or an acquired inhibitor of the enzyme by such compounds as glycyrrhizic acid, a component of natural licorice.

COLLECTION

Patient Preparation:
Collect urine with 10 grams of boric acid or keep urine refrigerated during collection if preservative is not used. Record 24-hour urine volume on test requisition and urine vial. Reference ranges do not apply to random urine samples.
Sample Type:
Urine
Collect:
24-hour Urine container
Amount to Collect:
10 mL
Preferred Volume:
10 mL
Minimum Volume:
2.1 mL
Stability (from collection to initiation):
Room temperature: 4 hours
Refrigerated: 72 hours
Frozen: 1 year
Storage/Transport Temperature:
Frozen
Unacceptable Conditions:
Received room temperature

PROCESSING

Test Code:
CRTN
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze. Note total volume on aliquot. Order Quest test code 41889N.
Preferred Volume:
10 mL
Minimum Volume: 2.1 mL

Unacceptable Conditions:
- Received room temperature

Stability (from collection to initiation):
- Room temperature: 4 hours
- Refrigerated: 72 hours
- Frozen: 1 year

Storage/Transport Temperature:
- Frozen

RESULT INTERPRETATION

Units: µg/24 h

Reference Interval:
- Adults: 23-195 µg/24 h

Additional Information:
Measurement of both Free Cortisol and Cortisone are useful in diagnosing patients with low-renin hypertension caused by apparent mineralocorticoid excess. This may be due to either an inherited defect in 11HSDB2 enzyme or an acquired inhibitor of the enzyme by such compounds as glycyrrhizic acid, a component of natural licorice.

ADMINISTRATIVE

CPT Codes:
- 83789

LOINC Codes:
- 14044-2

COMPLETE VIEW

Test Code: CRTN
Performing Lab: Quest
Sendout: Yes
Performed: Mon-Fri
Methodology: LC/MS/MS

Patient Preparation:
Collect urine with 10 grams of boric acid or keep urine refrigerated during collection if preservative is not used. Record 24-hour urine volume on test requisition and urine vial. Reference ranges do not apply to random urine samples.

Collect:
- 24-hour Urine container

Amount to Collect:
- 10 mL

Sample Type:
- Urine

Preferred Volume:
- 10 mL

Minimum Volume:
- 2.1 mL

Unacceptable Conditions:
Received room temperature

**Specimen Preparation:**
Aliquot and freeze. Note total volume on aliquot. Order Quest test code 41889N.

**Units:**
µg/24 h

**Reference Interval:**
Adults: 23-195 µg/24 h

**Storage/Transport Temperature:**
Frozen

**Stability (from collection to initiation):**
- Room temperature: 4 hours
- Refrigerated: 72 hours
- Frozen: 1 year

**Reported:**
2-6 days

**Additional Information:**
Measurement of both Free Cortisol and Cortisone are useful in diagnosing patients with low-renin hypertension caused by apparent mineralocorticoid excess. This may be due to either an inherited defect in 11βHSD2 enzyme or an acquired inhibitor of the enzyme by such compounds as glycyrrhizic acid, a component of natural licorice.

**CPT Codes:**
83789

**LOINC Codes:**
14044-2
**Coumadin**
**MOLT**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
HPLC

**Reported:**
Test run Monday, Wednesday, Friday. Result available: 4 to 6 days

**Additional Information:**
Standard method for monitoring therapeutic coumadin is the Prothrombin Time.

**Synonyms:**
- warfarin

**COLLECTION**

**Sample Type:**
Citrated plasma

**Collect:**
Blue top filled to full extent of vacuum x2

**Amount to Collect:**
5.4 mL blood

**Preferred Volume:**
3 mL plasma

**Minimum Volume:**
1.2 mL plasma

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Stability (from collection to initiation):**
Refrigerated 2 weeks, frozen at -20°C 18 months

**Unacceptable Conditions:**
Room temp sample. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.

**PROCESSING**

**Test Code:**
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Refrigerate or freeze sample at -20°C. Order Quest Nichols test # 936N.

**Preferred Volume:**
3 mL plasma
Minimum Volume:
- 1.2 mL plasma

Unacceptable Conditions:
- Room temp sample. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.

Stability (from collection to initiation):
- Refrigerated 2 weeks, frozen at -20C 18 months

RESULT INTERPRETATION

Units:
- µg/mL (mcg/mL)

Reference Interval:
- 1.0-10.0 ug/mL

Toxic: > 10.0 ug/mL

Additional Information:
- Standard method for monitoring therapeutic coumadin is the Prothrombin Time.

ADMINISTRATIVE

CPT Codes:
- 80299-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- HPLC

Remarks:
- 1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
- 2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
- 3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
- 4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Collect:
- Blue top filled to full extent of vacuum x2

Amount to Collect:
- 5.4 mL blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 3 mL plasma

Minimum Volume:
- 1.2 mL plasma

Unacceptable Conditions:
- Room temp sample. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.

Specimen Preparation:
- Refrigerate or freeze sample at -20C. Order Quest Nichols test # 936N.
Units:
    µg/mL (mcg/mL)
Reference Interval:
    1.0-10.0 ug/mL
    Toxic: > 10.0 ug/mL
Synonyms:
    • warfarin
Stability (from collection to initiation):
    Refrigerated 2 weeks, frozen at -20°C 18 months
Reported:
    Test run Monday, Wednesday, Friday. Result available: 4 to 6 days
Additional Information:
    Standard method for monitoring therapeutic coumadin is the Prothrombin Time.
CPT Codes:
    80299-90
Coxiella burnetii Antibodies, IgG & IgM
QFEV

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
IFA
Reported:
Test run Tuesday and Friday. Turnaround time: 3-6 days.

Additional Information:
This test includes both IgM and IgG antibodies to both phase I and II antigens and offers greater sensitivity than the formerly used CF test; the phase II IgG antibody corresponds most closely to the antibody detected in the latter.

The ratio of phase II to phase I antibodies is commonly > 1 in acute infection, is usually =1 in granulomatous hepatitis, and if < 1 suggests chronic infection such as endocarditis. Submit paired sera, one collected within 1 wk of onset of illness and another 2-3 weeks later; occasional patients will not show a rise in IgG phase II titer rise for 4-6 weeks, especially if antibiotic therapy has been given. IgM antibodies develop earlier and last a few weeks to a few months, whereas IgG antibodies may last for life. Although a single IgM titer of > 256 is highly suggestive of acute infection, diagnosis is most reliable when based on a titer increase of at least 4-fold. Testing a single serum is sufficient for periodic monitoring of employees by Employee Health.

Reflex Testing:
If screen is positive the titers will be performed at an additional charge.

Synonyms:
- Q fever antibodies

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
QFEV
Test Group:
Q fever
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum. Order Quest # 4085N.
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Units:
Titer
Reference Interval:
Negative titer < 16
Additional Information:
This test includes both IgM and IgG antibodies to both phase I and II antigens and offers greater sensitivity than the formerly used CF test; the phase II IgG antibody corresponds most closely to the antibody detected in the latter.

The ratio of phase II to phase I antibodies is commonly > 1 in acute infection, is usually =1 in granulomatous hepatitis, and if < 1 suggests chronic infection such as endocarditis. Submit paired sera, one collected within 1 wk of onset of illness and another 2-3 weeks later; occasional patients will not show a rise in IgG phase II titer rise for 4-6 weeks, especially if antibiotic therapy has been given. IgM antibodies develop earlier and last a few weeks to a few months, whereas IgG antibodies may last for life. Although a single IgM titer of > 256 is highly suggestive of acute infection, diagnosis is most reliable when based on a titer increase of at least 4-fold. Testing a single serum is sufficient for periodic monitoring of employees by Employee Health.

ADMINISTRATIVE

CPT Codes:
86638-90 x 4
LOINC Codes:
22211-7

COMPLETE VIEW

Available Stat:
No
Test Code:
QFEV
Test Group:
Q fever
Performing Lab:
Quest
Sendout:
Yes
Methodology:
IFA
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Refrigerate serum. Order Quest # 4085N.
Units:
Titer
Reference Interval:
Negative titer < 16

**Synonyms:**
- Q fever antibodies

**Reported:**
- Test run Tuesday and Friday. Turnaround time: 3-6 days.

**Reflex Testing:**
- If screen is positive the titers will be performed at an additional charge.

**Additional Information:**
- This test includes both IgM and IgG antibodies to both phase I and II antigens and offers greater sensitivity than the formerly used CF test; the phase II IgG antibody corresponds most closely to the antibody detected in the latter.

- The ratio of phase II to phase I antibodies is commonly > 1 in acute infection, is usually =1 in granulomatous hepatitis, and if < 1 suggests chronic infection such as endocarditis. Submit paired sera, one collected within 1 wk of onset of illness and another 2-3 weeks later; occasional patients will not show a rise in IgG phase II titer rise for 4-6 weeks, especially if antibiotic therapy has been given. IgM antibodies develop earlier and last a few weeks to a few months, whereas IgG antibodies may last for life. Although a single IgM titer of > 256 is highly suggestive of acute infection, diagnosis is most reliable when based on a titer increase of at least 4-fold. Testing a single serum is sufficient for periodic monitoring of employees by Employee Health.

**CPT Codes:**
- 86638-90 x 4

**LOINC Codes:**
- 22211-7

Test information subject to change
C-Reactive protein, Highly Sensitive, Serum / Plasma
CRPH

ORDERING

Available Stat:
No
Performing Lab:
Chemistry - Parnassus and Mission Bay
Performed:
24 hours per day 7 days per week
Methodology:
Near Infrared Particle Immunoassay - Beckman Coulter DxC800
Reported:
4 hours
Additional Information:

This assay is alleged to predict an increased risk of cardiovascular and cerebrovascular events in patients with elevated CRP levels relative to "baseline" CRP in patients without these diseases.

Relative risk is approximately 2-4 fold in men and 2-7 fold in women; the level of risk correlates with the degree of CRP elevation. Relative risk of cardiovascular events predicted by CRP determination is independent of serum cholesterol/HDL levels. Patients with elevated total cholesterol/HDL ratios plus higher serum CRP are at further increased risk of cardiovascular events compared to patients with either risk factor alone. Hence these two assays should be used together to determine overall cardiovascular risk.

Risk of ischemic stroke is believed to be best predicted by CRP testing alone.

"Normal" baseline CRP levels are directly related to age, with values of approximately 0.4 mg/L considered normal for ages 20-50 years, while 1.3 mg/L for ages 50-80. Use of this test to predict cardiovascular/stroke risk must be done in context with other clinical parameters.

The absolute relative risk as a function of CRP levels has not been extensively validated. Treatment of patients with elevated CRP levels, using statins and prophylactic ASA, has been shown to reduce cardiovascular risk.

Underlying tumor or inflammatory illness, including drug reactions or infections, may cause CRP elevation unrelated to the risk of cardiovascular disease; specimens should be obtained at least two weeks after the resolution of any acute inflammatory condition.

Synonyms:
- CRPhs
- cardiac CRP
- cardio CRP

COLLECTION

Sample Type:
Serum or plasma
Collect:
Light green top preferred, gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma
PROCESSING
Test Code: CRPH
Performing Lab: Chemistry - Parnassus and Mission Bay
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma

RESULT INTERPRETATION
Units: mg/L
Reference Interval:

<table>
<thead>
<tr>
<th>Tertile</th>
<th>CRP mg/L</th>
<th>Cardiovascular Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;1.0</td>
<td>Low</td>
</tr>
<tr>
<td>2</td>
<td>1.0-3.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>&gt; 3.0</td>
<td>High</td>
</tr>
</tbody>
</table>

Additional Information:

This assay is alleged to predict an increased risk of cardiovascular and cerebrovascular events in patients with elevated CRP levels relative to "baseline" CRP in patients without these diseases.

Relative risk is approximately 2-4 fold in men and 2-7 fold in women; the level of risk correlates with the degree of CRP elevation. Relative risk of cardiovascular events predicted by CRP determination is independent of serum cholesterol/HDL levels. Patients with elevated total cholesterol/HDL ratios plus higher serum CRP are at further increased risk of cardiovascular events compared to patients with either risk factor alone. Hence these two assays should be used together to determine overall cardiovascular risk.

Risk of ischemic stroke is believed to be best predicted by CRP testing alone.

"Normal" baseline CRP levels are directly related to age, with values of approximately 0.4 mg/L considered normal for ages 20-50 years, while 1.3 mg/L for ages 50-80. Use of this test to predict cardiovascular/stroke risk must be done in context with other clinical parameters.

The absolute relative risk as a function of CRP levels has not been extensively validated. Treatment of patients with elevated CRP levels, using statins and prophylactic ASA, has been shown to reduce cardiovascular risk.

Underlying tumor or inflammatory illness, including drug reactions or infections, may cause CRP elevation unrelated to the risk of cardiovascular disease; specimens should be obtained at least two weeks after the resolution of any acute inflammatory condition.

ADMINISTRATIVE
CPT Codes: 86141
LOINC Codes: 1988-5

COMPLETE VIEW
Available Stat: No
Test Code:
Performing Lab:
Chemistry - Parnassus and Mission Bay

Performed:
24 hours per day 7 days per week

Methodology:
Near Infrared Particle Immunoassay - Beckman Coulter DxC800

Collect:
Light green top preferred, gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Units:
mg/L

Reference Interval:

<table>
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</tr>
</tbody>
</table>

Synonyms:
- CRPhs
- cardiac CRP
- cardio CRP

Reported:
4 hours

Additional Information:


This assay is alleged to predict an increased risk of cardiovascular and cerebrovascular events in patients with elevated CRP levels relative to "baseline" CRP in patients without these diseases.

Relative risk is approximately 2-4 fold in men and 2-7 fold in women; the level of risk correlates with the degree of CRP elevation. Relative risk of cardiovascular events predicted by CRP determination is independent of serum cholesterol/HDL levels. Patients with elevated total cholesterol/HDL ratios plus higher serum CRP are at further increased risk of cardiovascular events compared to patients with either risk factor alone. Hence these two assays should be used together to determine overall cardiovascular risk.

Risk of ischemic stroke is believed to be best predicted by CRP testing alone.

"Normal" baseline CRP levels are directly related to age, with values of approximately 0.4 mg/L considered normal for ages 20-50 years, while 1.3 mg/L for ages 50-80. Use of this test to predict cardiovascular/stroke risk must be done in context with other clinical parameters.

The absolute relative risk as a function of CRP levels has not been extensively validated. Treatment of patients with elevated CRP levels, using statins and prophylactic ASA, has been shown to reduce cardiovascular risk.

Underlying tumor or inflammatory illness, including drug reactions or infections, may cause CRP elevation unrelated to the risk of cardiovascular disease; specimens should be obtained at least two weeks after the resolution of any acute inflammatory condition.

CPT Codes:
86141

LOINC Codes:
C-Reactive Protein, Serum / Plasma
CRP

ORDERING

Available Stat:
Yes
Performing Lab:
Chemistry - Parnassus and Mission Bay
Performed:
24 hours per day 7 days per week
Methodology:
Near Infrared Particle Immunoassay - Beckman Coulter DxC800
Reported:
4 hours
Additional Information:
This CRP assay is a high sensitivity method that can be used for assessment of cardiovascular risk as well as for assessment of inflammation associated with other clinical conditions.

<table>
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<tr>
<th>Tertile</th>
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<td>1.0 - 3.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>&gt;3.0</td>
<td>High</td>
</tr>
</tbody>
</table>

Synonyms:
- CRP

COLLECTION

Sample Type:
Serum or plasma
Collect:
Light green top preferred, gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma

PROCESSING

Test Code:
CRP
Performing Lab:
Chemistry - Parnassus and Mission Bay
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units: 
mg/L

Reference Interval:
<7.5 mg/L

Additional Information:
This CRP assay is a high sensitivity method that can be used for assessment of cardiovascular risk as well as for assessment of inflammation associated with other clinical conditions.

<table>
<thead>
<tr>
<th>Tertile</th>
<th>CRP mg/L</th>
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</tr>
<tr>
<td>3</td>
<td>&gt; 3.0</td>
<td>High</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
86140

LOINC Codes:
1988-5

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CRP

Performing Lab:
Chemistry - Parnassus and Mission Bay

Performed:
24 hours per day 7 days per week

Methodology:
Near Infrared Particle Immunoassay - Beckman Coulter DxC800

Collect:
Light green top preferred, gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Units:
mg/L

Reference Interval:
<7.5 mg/L

Synonyms:
• CRP

Reported:
4 hours

Additional Information:
This CRP assay is a high sensitivity method that can be used for assessment of cardiovascular risk as well as for assessment of inflammation associated with other clinical conditions.
### Tertile | CRP mg/L | Cardiovascular Risk
--- | --- | ---
1 | <1.0 | Low
2 | 1.0 - 3.0 | Moderate
3 | > 3.0 | High

**CPT Codes:**
86140

**LOINC Codes:**
1988-5
Creatine Disorders Panel, Serum or Plasma
CDPSP

ORDERING

Ordering Recommendations:
Initial test to diagnose or rule out creatine deficiency syndromes following clinical presentation. Order Creatine Disorders Panel, Urine (2002333), simultaneously for proper result interpretation.

Performing Lab:
ARUP

Performed:
Mon

Methodology:
Liquid Chromatography/Tandem Mass Spectrometry

Reported:
2-9 days

Synonyms:
- GAA & Creatine
- AGAT
- Creatine, Plasma
- Creatinine, plasma
- GAA + Creatine
- GAMT
- Guanidinoacetic Acid and Creatine
- Guanidinoacetic Acid + Creatine
- Guanidinoacetic acid, plasma

COLLECTION

Collect:
Green (sodium or lithium heparin), lavender (EDTA), plain red, or serum separator tube.

Remarks:
Clinical information is needed for appropriate interpretation. Additional required information includes age, gender, diet (e.g., TPN therapy), drug therapy, and family history. Biochemical Genetics Patient History Form is available on the ARUP Web site at http://www.aruplab.com/patienthistory or by contacting ARUP Client Services.

Stability (from collection to initiation):
- Ambient: Unacceptable
- Refrigerated: 1 week
- Frozen: 2 weeks

Storage/Transport Temperature:
Frozen

Unacceptable Conditions:
Specimens exposed to more than one freeze/thaw cycle.

PROCESSING

Test Code:
CDPSP

ARUP Test Code:
2002328

Sendout:
Yes

Performing Lab:
ARUP
Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.2 mL)

Unacceptable Conditions:
Specimens exposed to more than one freeze/thaw cycle.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatine, Serum/Plasma</td>
<td>By report</td>
</tr>
<tr>
<td>Guanidinoacetic Acid, Serum/Plasma</td>
<td>By report</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
82540; 82542

COMPLETE VIEW

Ordering Recommendations:
Initial test to diagnose or rule out creatine deficiency syndromes following clinical presentation. Order Creatine Disorders Panel, Urine (2002333), simultaneously for proper result interpretation.

Test Code:
CDPSP

ARUP Test Code:
2002328

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon

Methodology:
Liquid Chromatography/Tandem Mass Spectrometry

Remarks:
Clinical information is needed for appropriate interpretation. Additional required information includes age, gender, diet (e.g., TPN therapy), drug therapy, and family history. Biochemical Genetics Patient History Form is available on the ARUP Web site at http://www.aruplab.com/patienthistory or by contacting ARUP Client Services.

Collect:
Green (sodium or lithium heparin), lavender (EDTA), plain red, or serum separator tube.

Unacceptable Conditions:
Specimens exposed to more than one freeze/thaw cycle.

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.2 mL)

Reference Interval:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Creatine, Serum/Plasma</td>
<td>By report</td>
</tr>
</tbody>
</table>
Guanidinoacetic Acid, Serum/Plasma | By report

**Synonyms:**
- GAA & Creatine
- AGAT
- Creatine, Plasma
- Creatinine, plasma
- GAA + Creatine
- GAMT
- Guanidinoacetic Acid and Creatine
- Guanidinoacetic Acid + Creatine
- Guanidinoacetic acid, plasma

**Storage/Transport Temperature:**
Frozen.

**Stability (from collection to initiation):**
- Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 2 weeks

**Reported:**
- 2-9 days

**CPT Codes:**
- 82540; 82542
Creatine Disorders Panel, Urine
CDPU

ORDERING

Ordering Recommendations:
Initial test to diagnose or rule out creatine deficiency syndromes following clinical presentation. Order Creatine Disorders Panel, Serum or Plasma (2002328), simultaneously for proper result interpretation.

Performing Lab:
ARUP

Performed:
Mon

Methodology:
Liquid Chromatography/Tandem Mass Spectrometry

Reported:
2-9 days

Synonyms:
- GAA & Creatine
- Guanidinoacetic Acid & Creatine
- AGAT
- GAA + Creatine
- GAMT
- Guanidinoacetic Acid + Creatine

COLLECTION

Collect:
Random or timed urine.

Remarks:
Clinical information is needed for appropriate interpretation. Additional required information includes age, gender, diet (e.g., TPN therapy), drug therapy, and family history. Biochemical Genetics Patient History Form is available on the ARUP Web site at http://www.aruplab.com/patienthistory or by contacting ARUP Client Services.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.

Unacceptable Conditions:
Specimens exposed to more than one freeze/thaw cycle.

PROCESSING

Test Code:
CDPU

ARUP Test Code:
2002333

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transfer 2 mL urine to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.5 mL)

Unacceptable Conditions:
Specimens exposed to more than one freeze/thaw cycle.
Stability (from collection to initiation):
- Ambient: Unacceptable
- Refrigerated: Unacceptable
- Frozen: 2 weeks

Storage/Transport Temperature:
- Frozen

RESULT INTERPRETATION

Reference Interval:
Reports include age appropriate reference intervals and interpretation

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatine, Urine</td>
<td>By report</td>
</tr>
<tr>
<td>Guanidinoacetic Acid, Urine</td>
<td>By report</td>
</tr>
<tr>
<td>Creatinine, Urine</td>
<td>By report</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
- 82540
- 82570
- 82542

COMPLETE VIEW

Ordering Recommendations:
Initial test to diagnose or rule out creatine deficiency syndromes following clinical presentation. Order Creatine Disorders Panel, Serum or Plasma (2002328), simultaneously for proper result interpretation.

Test Code:
- CDPU
- ARUP Test Code:
  - 2002333
- Performing Lab:
  - ARUP
- Sendout:
  - Yes
- Performed:
  - Mon
- Methodology:
  - Liquid Chromatography/Tandem Mass Spectrometry
- Remarks:
  - Clinical information is needed for appropriate interpretation. Additional required information includes age, gender, diet (e.g., TPN therapy), drug therapy, and family history. Biochemical Genetics Patient History Form is available on the ARUP Web site at http://www.aruplab.com/patienthistory or by contacting ARUP Client Services.
- Collect:
  - Random or timed urine.
- Unacceptable Conditions:
  - Specimens exposed to more than one freeze/thaw cycle.
- Specimen Preparation:
  - Transfer 2 mL urine to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.5 mL)
- Reference Interval:
Reports include age appropriate reference intervals and interpretation

<table>
<thead>
<tr>
<th>Components</th>
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<tbody>
<tr>
<td>Creatine, Urine</td>
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</tr>
<tr>
<td>Guanidinoacetic Acid, Urine</td>
<td>By report</td>
</tr>
<tr>
<td>Creatinine, Urine</td>
<td>By report</td>
</tr>
</tbody>
</table>

Synonyms:
• GAA & Creatine
• Guanidinoacetic Acid & Creatine
• AGAT
• GAA + Creatine
• GAMT
• Guanidinoacetic Acid + Creatine

**Storage/Transport Temperature:**
Frozen.

**Stability (from collection to initiation):**
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

**Reported:**
2-9 days

**CPT Codes:**
82540; 82570; 82542
Creatine kinase - MB fraction
MBMU

ORDERING

Ordering Recommendations:
This test has been virtually replaced clinically with the Troponin I test and should not be ordered except in unusual circumstances.

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Immunochemiluminometric assay (Beckman DxI600)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Order CK, Total separately, if desired. Reference ranges were adopted from Beckman and verified in 226 adult blood donors.

Synonyms:
- Creatine kinase muscle/brain
- Creatine kinase cardiac specific
- CKi
- CK isoenzymes
- MB
- Creatine phosphokinase
- CKMB
- CK-MB
- CK MB

COLLECTION

Sample Type:
Plasma, Serum

Collect:
Light Green top, Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 48 hours, frozen -20C 6 months

PROCESSING

Test Code:
MBMU

Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 48 hours, frozen -20°C 6 months

RESULT INTERPRETATION

Units:
µg/L

Reference Interval:
0.6 - 6.3 µg/L

Additional Information:
Order CK, Total separately, if desired. Reference ranges were adopted from Beckman and verified in 226 adult blood donors.

ADMINISTRATIVE

CPT Codes:
82553

LOINC Codes:
13969-1

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
This test has been virtually replaced clinically with the Troponin I test and should not be ordered except in unusual circumstances.

Test Code:
MBMU

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Immunochemiluminometric assay (Beckman DxI600)

Collect:
Light Green top, Gold top

Amount to Collect:
2 mL blood

Sample Type:
Plasma, Serum

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Units:
µg/L

Reference Interval:
0.6 - 6.3 µg/L

Synonyms:
- Creatine kinase muscle/brain
- Creatine kinase cardiac specific
• CKi
• CK isoenzymes
• MB
• Creatine phosphokinase
• CKMB
• CK-MB
• CK MB

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 48 hours, frozen -20°C 6 months

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- Order CK, Total separately, if desired. Reference ranges were adopted from Beckman and verified in 226 adult blood donors.

**CPT Codes:**
- 82553

**LOINC Codes:**
- 13969-1

Test information subject to change
Creatine kinase, Total, Plasma / Serum

**ORDERING**

Available Stat:  
Yes

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:  
Test available 24 hours per day 7 days per week

Methodology:  
Spectrophotometric, kinetic

Reported:  
STAT 1 hour, Routine 4 hours

Additional Information:  
Levels are increased by IM injection or exercise. Hemolysis may artifactually increase the result.

Synonyms:  
- CPK
- CK
- Creatine phosphokinase

**COLLECTION**

Sample Type:  
Plasma or serum

Collect:  
Light green top preferred, Gold top acceptable

Amount to Collect:  
1 mL blood

Preferred Volume:  
0.5 mL plasma or serum

Minimum Volume:  
0.2 mL plasma or serum

Stability (from collection to initiation):  
Room temperature 4 hours, refrigerated 12 hours, frozen at -20C 3 days.

**PROCESSING**

Test Code:  
CK

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:  
0.5 mL plasma or serum

Minimum Volume:  
0.2 mL plasma or serum

Stability (from collection to initiation):  
Room temperature 4 hours, refrigerated 12 hours, frozen at -20C 3 days.

**RESULT INTERPRETATION**

Units:
**Reference Interval:**

**Male:**
- 0-4 years: 41-277 U/L
- 5-9 years: 54-269 U/L
- 10-14 years: 38-255 U/L
- >= 15 years: 50-388 U/L

**Female:**
- 0-4 years: 34-204 U/L
- 5-9 years: 44-189 U/L
- 10-14 years: 28-170 U/L
- >= 15 years: 37-241 U/L

1. Normal range for 1 to 15 year old children adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
2. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF. Adult range adopted for children 15-18 years.

**Additional Information:**
Levels are increased by IM injection or exercise. Hemolysis may artifactually increase the result.

**ADMINISTRATIVE**

**CPT Codes:**
- 82550

**LOINC Codes:**
- 2157-6

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- CK

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Spectrophotometric, kinetic

**Collect:**
- Light green top preferred, Gold top acceptable

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Plasma or serum

**Preferred Volume:**
- 0.5 mL plasma or serum

**Minimum Volume:**
- 0.2 mL plasma or serum

**Units:**
- U/L

**Reference Interval:**

**Male:**
- 0-4 years: 41-277 U/L
- 5-9 years: 54-269 U/L
- 10-14 years: 38-255 U/L
- >= 15 years: 50-388 U/L
Female:
0-4 years: 34-204 U/L
5-9 years: 44-189 U/L
10-14 years: 28-170 U/L
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1. Normal range for 1 to 15 year old children adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
2. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF. Adult range adopted for children 15-18 years.

Synonyms:
- CPK
- CK
- Creatine phosphokinase

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 12 hours, frozen at -20C 3 days.

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
Levels are increased by IM injection or exercise. Hemolysis may artifactually increase the result.

CPT Codes:
82550

LOINC Codes:
2157-6
Creatinine Clearance
CRCL

ORDERING

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Spectrophotometric, kinetic (alkaline picrate,Jaffe) assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization

Reported:
4 hours

Additional Information:
Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

GFR can also be estimated from serum creatinine measurements without the need for urine creatinine measurements. See the laboratory manual entry on serum creatinine for details on estimating GFR from serum creatinine results.

COLLECTION

Sample Type:
24 hour urine collection or timed urine AND serum

Collect:
24 hour urine collection container AND Gold top

Amount to Collect:
Entire 24 hour urine output and 2 mL blood (Gold top)

Preferred Volume:
Urine: Complete collection
Serum: 1 mL serum

Minimum Volume:
Urine: Complete collection
Serum: 0.2 mL serum

Remarks:
Submit serum (Gold top) drawn within 24 hours of urine collection-preferably within the interval of collection.

Give the weight in kg and height in cm of the patient if a corrected clearance is needed.

Refrigerate the collection container during the collection period.

Stability (from collection to initiation):
Refrigerated 2 days

Unacceptable Conditions:
Container not refrigerated during collection

PROCESSING

Test Code:
CRCL

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
Urine: Complete collection
Serum: 1 mL serum

Minimum Volume:
Urine: Complete collection
Serum: 0.2 mL serum

Unacceptable Conditions:
Container not refrigerated during collection

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:

mL/min/1.73 m²

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male and Female</th>
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<tbody>
<tr>
<td>0-7 days</td>
<td>17-60 mL/min/1.73 m²</td>
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<tr>
<td>8-30 days</td>
<td>26-68 mL/min/1.73 m²</td>
</tr>
<tr>
<td>1-2 months</td>
<td>30-86 mL/min/1.73 m²</td>
</tr>
<tr>
<td>3-5 months</td>
<td>39-114 mL/min/1.73 m²</td>
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<tr>
<td>6-11 months</td>
<td>49-157 mL/min/1.73 m²</td>
</tr>
<tr>
<td>12-23 months</td>
<td>62-191 mL/min/1.73 m²</td>
</tr>
<tr>
<td>2-12 years</td>
<td>89-165 mL/min/1.73 m²</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-29 years</td>
<td>88-146 mL/min/1.73 m²</td>
<td>81-134 mL/min/1.73 m²</td>
</tr>
<tr>
<td>30-39 years</td>
<td>82-140 mL/min/1.73 m²</td>
<td>75-128 mL/min/1.73 m²</td>
</tr>
<tr>
<td>40-49 years</td>
<td>75-133 mL/min/1.73 m²</td>
<td>69-122 mL/min/1.73 m²</td>
</tr>
<tr>
<td>50-59 years</td>
<td>68-126 mL/min/1.73 m²</td>
<td>64-116 mL/min/1.73 m²</td>
</tr>
<tr>
<td>60-69 years</td>
<td>61-120 mL/min/1.73 m²</td>
<td>58-110 mL/min/1.73 m²</td>
</tr>
<tr>
<td>&gt;=70 years</td>
<td>55-113 mL/min/1.73 m²</td>
<td>52-105 mL/min/1.73 m²</td>
</tr>
</tbody>
</table>


Additional Information:

Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

GFR can also be estimated from serum creatinine measurements without the need for urine creatinine measurements. See the laboratory manual entry on serum creatinine for details on estimating GFR from serum creatinine results.

ADMINISTRATIVE

CPT Codes:
82575

LOINC Codes:
2164-2

COMPLETE VIEW

Available Stat:
No
Test Code: CRCL
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Spectrophotometric, kinetic (alkaline picrate, Jaffe) assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization
Remarks: Submit serum (Gold top) drawn within 24 hours of urine collection—preferably within the interval of collection.
Give the weight in kg and height in cm of the patient if a corrected clearance is needed.
Refrigerate the collection container during the collection period.
Collect: 24 hour urine collection container AND Gold top
Amount to Collect: Entire 24 hour urine output and 2 mL blood (Gold top)
Sample Type: 24 hour urine collection or timed urine AND serum
Preferred Volume:
<table>
<thead>
<tr>
<th>Type</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>Complete collection</td>
</tr>
<tr>
<td>Serum</td>
<td>1 mL</td>
</tr>
</tbody>
</table>
Minimum Volume:
<table>
<thead>
<tr>
<th>Type</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>Complete collection</td>
</tr>
<tr>
<td>Serum</td>
<td>0.2 mL</td>
</tr>
</tbody>
</table>
Unacceptable Conditions: Container not refrigerated during collection
Units: mL/min/1.73 m²
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male and Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>17-60 mL/min/1.73 m²</td>
</tr>
<tr>
<td>8-30 days</td>
<td>26-68 mL/min/1.73 m²</td>
</tr>
<tr>
<td>1-2 months</td>
<td>30-86 mL/min/1.73 m²</td>
</tr>
<tr>
<td>3-5 months</td>
<td>39-114 mL/min/1.73 m²</td>
</tr>
<tr>
<td>6-11 months</td>
<td>49-157 mL/min/1.73 m²</td>
</tr>
<tr>
<td>12-23 months</td>
<td>62-191 mL/min/1.73 m²</td>
</tr>
<tr>
<td>2-12 years</td>
<td>89-165 mL/min/1.73 m²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-29 years</td>
<td>88-146 mL/min/1.73 m²</td>
<td>81-134 mL/min/1.73 m²</td>
</tr>
<tr>
<td>30-39 years</td>
<td>82-140 mL/min/1.73 m²</td>
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<td>64-116 mL/min/1.73 m²</td>
</tr>
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<td>60-69 years</td>
<td>61-120 mL/min/1.73 m²</td>
<td>58-110 mL/min/1.73 m²</td>
</tr>
<tr>
<td>&gt;=70 years</td>
<td>55-113 mL/min/1.73 m²</td>
<td>52-105 mL/min/1.73 m²</td>
</tr>
</tbody>
</table>

Stability (from collection to initiation): Refrigerated 2 days
Reported:

4 hours

Additional Information:

Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

GFR can also be estimated from serum creatinine measurements without the need for urine creatinine measurements. See the laboratory manual entry on serum creatinine for details on estimating GFR from serum creatinine results.

CPT Codes:

82575

LOINC Codes:

2164-2
Creatinine, 24 hour (or timed) urine
CRU

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Enzymatic assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
To convert mg/kg/d to µmol/kg/d (SI units) multiply by 8.84. Output varies with the diet and weight.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

COLLECTION

Sample Type: Timed urine collection
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output during collection period
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Remarks:
Include the patient's weight in kg on the request slip.
Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code: CRU
Test Group: Creatinine
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/kg/D

Reference Interval:

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>8-20 mg/kg/D</td>
</tr>
<tr>
<td>1-11</td>
<td>8-22 mg/kg/D</td>
</tr>
<tr>
<td>12-15</td>
<td>8-30 mg/kg/D</td>
</tr>
<tr>
<td>Male 16-89 years</td>
<td>14-26 mg/kg/D</td>
</tr>
<tr>
<td>Female 16-89 years</td>
<td>11-20 mg/kg/D</td>
</tr>
<tr>
<td>&gt; 90 years</td>
<td>&gt; 9 mg/kg/D</td>
</tr>
</tbody>
</table>

Reference ranges adopted from Tietz Fundamentals of Clinical Chemistry, 5th Edition

Additional Information:
To convert mg/kg/d to µmol/kg/d (SI units) multiply by 8.84. Output varies with the diet and weight.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
82570

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CRU

Test Group:
Creatinine

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Enzymatic assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization

Remarks:
Include the patient's weight in kg on the request slip.

Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
24 hour urine collection container

Amount to Collect:
Entire urine output during collection period

Sample Type:
Timed urine collection

Preferred Volume:
1 mL urine

**Minimum Volume:**
0.2 mL urine

**Units:**
mg/kg/D

**Reference Interval:**
- **Age (years):**
  - <1: 8-20 mg/kg/D
  - 1-11: 8-22 mg/kg/D
  - 12-15: 8-30 mg/kg/D
  - Male 16-89 years: 14-26 mg/kg/D
  - Female 16-89 years: 11-20 mg/kg/D
  - > 90 years: > 9 mg/kg/D

Reference ranges adopted from Tietz Fundamentals of Clinical Chemistry, 5th Edition

**Stability (from collection to initiation):**
Refrigerated 2 days

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
To convert mg/kg/d to µmol/kg/d (SI units) multiply by 8.84. Output varies with the diet and weight.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

**CPT Codes:**
- 82570
Creatinine, Body Fluid
CRB

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (alkaline picrate,Jaffe) assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
CRB

Test Group:
Creatinine

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
None established. If urine leakage into a body cavity has occurred, the concentration of creatinine in the body fluid may be within the concentration range of creatinine found in urine. Random urine creatinine concentrations are typically between 80 mg/dL to 150 mg/dL and can range from approximately 20 mg/dL to 300 mg/dL (see Barr, DB et al. Environmental Health Perspectives 113:192-200, 2005).

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

ADMINISTRATIVE

CPT Codes:
82570

LOINC Codes:
12190-5

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
CRB

Test Group:
Creatinine

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (alkaline picrate, Jaffe) assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body Fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Units:
Reference Interval:

None established. If urine leakage into a body cavity has occurred, the concentration of creatinine in the body fluid may be within the concentration range of creatinine found in urine. Random urine creatinine concentrations are typically between 80 mg/dL to 150 mg/dL and can range from approximately 20 mg/dL to 300 mg/dL (see Barr, DB et al. Environmental Health Perspectives 113:192-200, 2005).

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:

STAT 1 hour, Routine 4 hours

Additional Information:

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:

82570

LOINC Codes:

12190-5
Creatinine, Plasma / Serum
CRG

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization.
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
In patients receiving catecholamine infusions (e.g., dopamine, dobutamine, norepinephrine, or epinephrine), falsely low serum/plasma creatinine results can occur with this enzymatic creatinine assay when blood is sampled through an indwelling catheter. In these cases, accurate measurements of creatinine can be obtained by testing blood samples obtained by venipuncture instead of through an indwelling catheter (based on in-house studies and Saenger AK, Clinical Chemistry 2009, vol 55:9 1732-1736).

To convert mg/dL to µmol/L (SI units) multiply by 88.4.

Estimated GFR (eGFR) is reported with serum creatinine results in adults and is determined using the CKD-EPI equation (creatinine results traceable to isotope dilution mass spec IDMS calibration). Results greater than 120 mL/min/1.73 meters squared body surface area are displayed as > 120 mL/min and are not reported as an exact number. Note that the estimated GFR result is not reliable in certain groups including severely ill patients. Estimates of GFR with the CKD-EPI equation like other equations may also be less accurate in specific ethnic groups (eg, Asians in the United States), pregnant women, and those with unusual muscle mass, body habitus, and weight (eg, morbid obesity, amputees). Reference: Assessment of Kidney Function. WWW.UpToDate.com

CKD-EPI equation:

\[
GFR = 141 \times \min \left( \frac{Scr}{0.7}, 1 \right) \alpha \times \max \left( \frac{Scr}{0.9}, 1 \right) - 1.209 \times 0.993 \times \text{Age} \times \left\{ \begin{array}{ll}
1 & \text{if female} \\
1.159 & \text{if African-American}
\end{array} \right.
\]

where:
- Scr is serum creatinine in mg/dL,
- 0.7 is 0.7 for females and 0.9 for males,
- alpha is -0.329 for females and -0.411 for males,
- min indicates the minimum of Scr /? or 1, and
- max indicates the maximum of Scr /? or 1.

According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation http://www.nkdep.nih.gov/lab-evaluation/gfr-calculators/children-conventional-unit.shtml

Bedside IDMS-traceable Schwartz Equation for Children

\[
GFR (\text{mL/min/1.73 m}^2) = (0.41 \times \text{Height in cm}) / \text{Creatinine in mg/dL}
\]

Synonyms:
- GFR
- eGFR
- glomerular filtration rate

COLLECTION

Sample Type: Plasma or serum
Collect:
Light green top preferred, Gold top acceptable

**Amount to Collect:**

1 mL blood

**Preferred Volume:**

0.5 mL plasma or serum

**Minimum Volume:**

0.2 mL plasma or serum

**Stability (from collection to initiation):**

Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

---

**PROCESSING**

**Test Code:**

CRG

**Test Group:**

Creatinine

**Performing Lab:**

Parnassus, Mission Bay & Mt. Zion Chemistry

**Preferred Volume:**

0.5 mL plasma or serum

**Minimum Volume:**

0.2 mL plasma or serum

**Stability (from collection to initiation):**

Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

---

**RESULT INTERPRETATION**

**Units:**

Creatinine: mg/dL, eGFR in mL/min/1.73 m²

**Reference Interval:**

<table>
<thead>
<tr>
<th>Creatinine:</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 14 days</td>
<td>0.30-0.90 mg/dL</td>
<td>0.30-0.90 mg/dL</td>
</tr>
<tr>
<td>15 days to &lt; 2 years</td>
<td>0.10-0.30 mg/dL</td>
<td>0.10-0.30 mg/dL</td>
</tr>
<tr>
<td>2 to &lt; 5 years</td>
<td>0.20-0.40 mg/dL</td>
<td>0.20-0.40 mg/dL</td>
</tr>
<tr>
<td>5 to &lt; 12 years</td>
<td>0.30-0.60 mg/dL</td>
<td>0.30-0.60 mg/dL</td>
</tr>
<tr>
<td>12 to &lt; 15 years</td>
<td>0.40-0.80 mg/dL</td>
<td>0.40-0.80 mg/dL</td>
</tr>
<tr>
<td>15 to &lt; 19 years</td>
<td>0.60-1.00 mg/dL</td>
<td>0.50-0.80 mg/dL</td>
</tr>
<tr>
<td>&gt;= 19 years</td>
<td>0.61-1.24 mg/dL</td>
<td>0.44-1.00 mg/dL</td>
</tr>
</tbody>
</table>

**eGFR:**

>= 18 years > 60 mL/min/1.73 m²

<18 years Not calculated (See Addtl. Info.)

---


2. Normal range for adults was adopted from vendor Chemistry Information Sheet and verified by running 53 female and 44 male lab volunteers at UCSF Clinical Labs.

**Additional Information:**

In patients receiving catecholamine infusions (e.g., dopamine, dobutamine, norepinephrine, or epinephrine), falsely low serum/plasma creatinine results can occur with this enzymatic creatinine assay when blood is sampled through an indwelling catheter. In these cases, accurate measurements of creatinine can be obtained by testing blood samples obtained by venipuncture instead of through an indwelling catheter (based on in-house studies and Saenger AK, Clinical Chemistry 2009, vol 55:9 1732-1736).

To convert mg/dL to µmol/L (SI units) multiply by 88.4.
Estimated GFR (eGFR) is reported with serum creatinine results in adults and is determined using the CKD-EPI equation (creatinine results traceable to isotope dilution mass spec IDMS calibration). Results greater than 120 mL/min/1.73 meters squared body surface area are displayed as > 120 mL/min and are not reported as an exact number. Note that the estimated GFR result is not reliable in certain groups including severely ill patients. Estimates of GFR with the CKD-EPI equation like other equations may also be less accurate in specific ethnic groups (eg, Asians in the United States), pregnant women, and those with unusual muscle mass, body habitus, and weight (eg, morbid obesity, amputees). Reference: Assessment of Kidney Function. WWW.UpToDate.com

**CKD-EPI equation:**

\[
\text{GFR} = 141 \times \min (\text{Scr} /\beta, 1)\alpha \times \max(\text{Scr} /\beta, 1) - 1.209 \times 0.993 \text{Age} \times 1.018 \ [\text{if female}] \times 1.159 \ [\text{if African-American}]
\]

where:
- \( \text{Scr} \) is serum creatinine in mg/dL,
- \( \beta \) is 0.7 for females and 0.9 for males,
- \( \alpha \) is -0.329 for females and -0.411 for males,
- \( \min \) indicates the minimum of \( \text{Scr} /\beta \) or 1, and
- \( \max \) indicates the maximum of \( \text{Scr} /\beta \) or 1.

According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation


**Bedside IDMS-traceable Schwartz Equation for Children**

\[
\text{GFR (mL/min/1.73 m²)} = (0.41 \times \text{Height in cm}) / \text{Creatinine in mg/dL}
\]

**ADMINISTRATIVE**

| CPT Codes: | 82565 |
| LOINC Codes: | 2160-0 |

**COMPLETE VIEW**

Available Stat: Yes
Test Code: CRG
Test Group: Creatinine
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic assay on Beckman DxC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization.
Collect: Light green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Sample Type: Plasma or serum
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Units:

Creatinine: mg/dL, eGFR in mL/min/1.73 m^2

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 14 days</td>
<td>0.30-0.90 mg/dL</td>
<td>0.30-0.90 mg/dL</td>
</tr>
<tr>
<td>15 days to &lt; 2 years</td>
<td>0.10-0.30 mg/dL</td>
<td>0.10-0.30 mg/dL</td>
</tr>
<tr>
<td>2 to &lt; 5 years</td>
<td>0.20-0.40 mg/dL</td>
<td>0.20-0.40 mg/dL</td>
</tr>
<tr>
<td>5 to &lt; 12 years</td>
<td>0.30-0.60 mg/dL</td>
<td>0.30-0.60 mg/dL</td>
</tr>
<tr>
<td>12 to &lt; 15 years</td>
<td>0.40-0.80 mg/dL</td>
<td>0.40-0.80 mg/dL</td>
</tr>
<tr>
<td>15 to &lt; 19 years</td>
<td>0.60-1.00 mg/dL</td>
<td>0.50-0.80 mg/dL</td>
</tr>
<tr>
<td>&gt;= 19 years</td>
<td>0.61-1.24 mg/dL</td>
<td>0.44-1.00 mg/dL</td>
</tr>
</tbody>
</table>

eGFR:

| >= 18 years | > 60 mL/min/1.73 m^2    |
| <18 years   | Not calculated (See Adtl. Info.) |

2. Normal range for adults was adopted from vendor Chemistry Information Sheet and verified by running 53 female and 44 male lab volunteers at UCSF Clinical Labs.

Synonyms:

- GFR
- eGFR
- glomerular filtration rate

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:

STAT 1 hour, Routine 4 hours

Additional Information:

In patients receiving catecholamine infusions (e.g., dopamine, dobutamine, norepinephrine, or epinephrine), falsely low serum/plasma creatinine results can occur with this enzymatic creatinine assay when blood is sampled through an indwelling catheter. In these cases, accurate measurements of creatinine can be obtained by testing blood samples obtained by venipuncture instead of through an indwelling catheter (based on in-house studies and Saenger AK, Clinical Chemistry 2009, vol 55:9 1732-1736).

To convert mg/dL to µmol/L (SI units) multiply by 88.4.

Estimated GFR (eGFR) is reported with serum creatinine results in adults and is determined using the CKD-EPI equation (creatinine results traceable to isotope dilution mass spec IDMS calibration). Results greater than 120 mL/min/1.73 meters squared body surface area are displayed as > 120 mL/min and are not reported as an exact number. Note that the estimated GFR result is not reliable in certain groups including severely ill patients. Estimates of GFR with the CKD-EPI equation like other equations may also be less accurate in specific ethnic groups (eg, Asians in the United States), pregnant women, and those with unusual muscle mass, body habitus, and weight (eg, morbid obesity, amputees). Reference: Assessment of Kidney Function. WWW.UpToDate.com

CKD-EPI equation:

\[ GFR = 141 \times \min (\text{Scr} /?, 1) \times \alpha \times \max (\text{Scr} /?, 1) - 1.209 \times 0.993 \text{Age} \times 1.018 [\text{if female}] \times 1.159 [\text{if African-American}] \]

where:
- \( \text{Scr} \) is serum creatinine in mg/dL,
- ? is 0.7 for females and 0.9 for males,
- \( \alpha \) is -0.329 for females and -0.411 for males,
- \( \min \) indicates the minimum of \( \text{Scr} /? \) or 1, and
- \( \max \) indicates the maximum of \( \text{Scr} /? \) or 1.

According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation http://www.nkdep.nih.gov/lab-evaluation/gfr-calculators/children-conventional-unit.shtml
Bedside IDMS-traceable Schwartz Equation for Children

GFR (mL/min/1.73 m^2) = (0.41 x Height in cm) / Creatinine in mg/dL

**CPT Codes:**
- 82565

**LOINC Codes:**
- 2160-0
Creatinine, random urine
CRUR

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Enzymatic assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Output varies with the diet and weight.
Random urine creatinine concentrations are typically between 80 mg/dL to 150 mg/dL and can range from approximately 20 mg/dL to 300 mg/dL (see Barr, DB et al. Environmental Health Perspectives 113:192-200, 2005).

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
CRUR
Test Group:
Creatinine
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

**Reference Interval:**
See Additional Information

**Additional Information:**
Output varies with the diet and weight.

Random urine creatinine concentrations are typically between 80 mg/dL to 150 mg/dL and can range from approximately 20 mg/dL to 300 mg/dL (see Barr, DB et al. Environmental Health Perspectives 113:192-200, 2005).

**ADMINISTRATIVE**

**CPT Codes:**
82570

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
CRUR

**Test Group:**
Creatinine

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Enzymatic assay on Beckman DXC 600/800 analyzers. Calibration traceable to isotope dilution mass spec (IDMS) standardization

**Collect:**
Urine cup

**Amount to Collect:**
20 mL urine

**Sample Type:**
Random urine

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.2 mL urine

**Units:**
mg/dL

**Reference Interval:**
See Additional Information

**Stability (from collection to initiation):**
Refrigerated 2 days

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Output varies with the diet and weight.

Random urine creatinine concentrations are typically between 80 mg/dL to 150 mg/dL and can range from approximately 20 mg/dL to 300 mg/dL (see Barr, DB et al. Environmental Health Perspectives 113:192-200, 2005).

**CPT Codes:**
82570
CRLF2 Xp22.33 BA FISH
BCRLF2, CRLF2

ORDERING

Available Stat: No
Performing Lab: Molecular Genetics - Cytogenetics
Performed:
Monday - Friday 0900-1700
Methodology:
FISH
Reported:
1-2 weeks
Synonyms:
• Xp22.33 break apart FISH, CRLF2 FISH

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow, Bone marrow core biopsy
Collect:
Dark green top
Amount to Collect:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm
Preferred Volume:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Blood: 1 mL
Bone marrow: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix sample well with anticoagulant. keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
BCRLF2: Blood
CRLF2: Bone marrow
Performing Lab:
Molecular Genetics - Cytogenetics
Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.
Preferred Volume:
Blood: 2 mL
Bone marrow: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
Room temperature 2 days

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
Yes

Available Stat:
No

Test Code:
- BCRLF2: Blood
- CRLF2: Bone marrow

Performing Lab:
Molecular Genetics - Cytogenetics

Performed:
Monday - Friday 0900-1700

Methodology:
FISH

Remarks:
Mix sample well with anticoagulant. keep at room temperature

Collect:
Dark green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
Heparinized whole blood or bone marrow, Bone marrow core biopsy

Preferred Volume:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples. Transport to China Basin Cytogenetics asap.

Synonyms:
- Xp22.33 break apart FISH, CRLF2 FISH

Stability (from collection to initiation):
Room temperature 2 days
Reported:
  1-2 weeks
CPT Codes:
  88271 x2, 88275
LDT or Modified FDA:
  Yes
Crossmatch
XM, XMAG, XMPW, XMPG

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Blood Banks
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours
Additional Information:
3 mL may suffice for an infant < 4 months old if blood is not needed to cover surgical losses. This test is always ordered in conjunction with a separately charged Blood Typing and Antibody Screen, and cannot be ordered by itself. The Coombs test is employed when the antibody screen is positive; the various other modifications to the standard crossmatch are used to overcome the effects of non-specific cold-reactive antibodies.

See also HLA Crossmatch

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL blood
Preferred Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 3 mL
1 -18 years: 3-6 mL (3 mL OK for small children)
> 18 years: 6 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 3 mL
Minimum Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 1 mL
1 -18 years: 3 mL
> 18 years: 5 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 1 mL
Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

PROCESSING

Test Code:
XM-Standard
XMAG-w/ Coombs
XMPW-w/ prewarming to 37C
XMPG-w/ Polyethylene Glycol (PEG)

Performing Lab:
Parnassus & Mission Bay Blood Banks

Preferred Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 3 mL
1 -18 years: 3-6 mL (3 mL OK for small children)
> 18 years: 6 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 3 mL

Minimum Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 1 mL
1 -18 years: 3 mL
> 18 years: 5 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 1 mL

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

RESULT INTERPRETATION

Reference Interval:
See Additional Information

Additional Information:
3 mL may suffice for an infant < 4 months old if blood is not needed to cover surgical losses. This test is always ordered in conjunction with a separately charged Blood Typing and Antibody Screen, and cannot be ordered by itself. The Coombs test is employed when the antibody screen is positive; the various other modifications to the standard crossmatch are used to overcome the effects of non-specific cold-reactive antibodies.

See also HLA Crossmatch

COMPLETE VIEW

Available Stat:
Yes

Test Code:
XM-Standard
XMAG-w/ Coombs
XMPW-w/ prewarming to 37C
XMPG-w/ Polyethylene Glycol (PEG)

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test available 24 hours per day 7 days per week

Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood
Sample Type:
EDTA whole blood

Preferred Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 3 mL
1 - 18 years: 3-6 mL (3 mL OK for small children)
> 18 years: 6 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 3 mL

Minimum Volume:
<4 mo: Full Microtainer (0.8 mL)
4 mo - 1 year: 1 mL
1 - 18 years: 3 mL
> 18 years: 5 mL

Check Specimen:
< 4 mo: Full Microtainer (0.8 mL)
> 4 mo: 1 mL

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Reference Interval:
See Additional Information

Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Additional Information:
3 mL may suffice for an infant < 4 months old if blood is not needed to cover surgical losses. This test is always ordered in conjunction with a separately charged Blood Typing and Antibody Screen, and cannot be ordered by itself. The Coombs test is employed when the antibody screen is positive; the various other modifications to the standard crossmatch are used to overcome the effects of non-specific cold-reactive antibodies.

See also HLA Crossmatch
Cryofibrinogen
CRYF

ORDERING

Performing Lab:
Quest
Performed:
Sunday-Friday
Methodology:
Cold precipitation
Reported:
3-5 days

COLLECTION

Patient Preparation:
A fasting sample is required
Sample Type:
Plasma
Collect:
Light-blue top
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL plasma
Minimum Volume:
3 mL plasma
Remarks:
Collect blood into 3 (5 mL) (LB) or (L) tubes. Place immediately in a 37° C water bath.
Stability (from collection to initiation):
Room Temperature: 7 days
Refrigerated/Frozen: Unacceptable
Storage/Transport Temperature:
Room Temperature

PROCESSING

Test Code:
CRYF
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge blood specimens in centrifuge carriers prewarmed to 37° C at 3000 rpm for a minimum of 10 minutes. Separate plasma from red cells, avoiding transfer of red cells, into plastic transport tubes. Order Quest test code 376.
Preferred Volume:
6 mL plasma
Minimum Volume:
3 mL plasma
Stability (from collection to initiation):
Room Temperature: 7 days
Refrigerated/Frozen: Unacceptable
Storage/Transport Temperature:
Room Temperature

RESULT INTERPRETATION

Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
82585
LOINC Codes:
11043-7

COMPLETE VIEW

Test Code:
CRYF
Performing Lab:
Quest
Sendout:
Yes
Performed:
Sunday-Friday
Methodology:
Cold precipitation
Patient Preparation:
A fasting sample is required
Remarks:
Collect blood into 3 (5 mL) (LB) or (L) tubes. Place immediately in a 37°C water bath.
Collect:
Light-blue top
Amount to Collect:
12 mL blood
Sample Type:
Plasma
Preferred Volume:
6 mL plasma
Minimum Volume:
3 mL plasma
Specimen Preparation:
Centrifuge blood specimens in centrifuge carriers prewarmed to 37°C at 3000 rpm for a minimum of 10 minutes. Separate plasma from red cells, avoiding transfer of red cells, into plastic transport tubes. Order Quest test code 376.
Reference Interval:
Negative
Storage/Transport Temperature:
Room Temperature
Stability (from collection to initiation):
Room Temperature: 7 days
Refrigerated/Frozen: Unacceptable
Reported:
3-5 days
CPT Codes:
82585
LOINC Codes:
11043-7
Cryoglobulin
CRYQ

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Tuesday, Friday (day shift)
Reported: 3-5 days

Additional Information:
If immunofixation (IFE) for a cryoglobulin is requested, a quantitative cryoglobulin is run first to determine whether the quantity of cryoprecipitate is sufficient for IFE analysis. Samples are held for a minimum of 72 hours after receipt before the analysis for cryoglobulin is performed. Cryoglobulinemias are generally classified as:

**Type I**: Monoclonal antibodies, associated most often with myeloma or lymphoproliferative disorders, and highly correlated with the development of renal disease.

**Type II**: Most commonly found, these are mixtures of mono- and polyclonal antibodies, and are associated with the various connective tissue diseases and, especially, chronic infection with Hepatitis C, which should be sought in any case of cryoglobulinemia. The cryoglobulin often recognizes portions of the HCV protein envelope and the cryoprecipitates are rich in virus.

**Type III**: Polyclonal antibodies, associated mainly with lupus erythematosus.


Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 6 mL blood
Preferred Volume: 3 mL serum
Minimum Volume: 2 mL serum
Remarks: Once collected, please keep all samples warm by wrapping with a heel warmer and deliver to the laboratory as soon as possible.

Unacceptable Conditions: Room temperature or colder sample received.

PROCESSING

Test Code: CRYQ
Performing Lab: Immunology
Specimen Preparation:
Warm specimen for 1 hour at 37°C in heating block; centrifuge immediately thereafter, and aliquot into conical centrifuge tube. Refrigerate specimen at 2-8°C.

**Preferred Volume:**
3 mL serum

**Minimum Volume:**
2 mL serum

**Unacceptable Conditions:**
Room temperature or colder sample received.

---

**RESULT INTERPRETATION**

**Units:**
- g/L

**Reference Interval:**
- <0.12 g/L

**Additional Information:**
If immunofixation (IFE) for a cryoglobulin is requested, a quantitative cryoglobulin is run first to determine whether the quantity of cryoprecipitate is sufficient for IFE analysis. Samples are held for a minimum of 72 hours after receipt before the analysis for cryoglobulin is performed. Cryoglobulinemias are generally classified as:

**Type I:** Monoclonal antibodies, associated most often with myeloma or lymphoproliferative disorders, and highly correlated with the development of renal disease.

**Type II:** Most commonly found, these are mixtures of mono- and polyclonal antibodies, and are associated with the various connective tissue diseases and, especially, chronic infection with Hepatitis C, which should be sought in any case of cryoglobulinemia. The cryoglobulin often recognizes portions of the HCV protein envelope and the cryoprecipitates are rich in virus.

**Type III:** Polyclonal antibodies, associated mainly with lupus erythematosus.


**Note:** This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

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**ADMINISTRATIVE**

**CPT Codes:**
- 82784

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 2168-3

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**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- CRYQ

**Performing Lab:**
- Immunology

**Performed:**
- Tuesday, Friday (day shift)

**Remarks:**
- Once collected, please keep all samples warm by wrapping with a heel warmer and deliver to the laboratory as soon as possible.

**Collect:**
- Gold top
Amount to Collect:
   6 mL blood

Sample Type:
   Serum

Preferred Volume:
   3 mL serum

Minimum Volume:
   2 mL serum

Unacceptable Conditions:
   Room temperature or colder sample received.

Specimen Preparation:
   Warm specimen for 1 hour at 37C in heating block; centrifuge immediately thereafter, and aliquot into conical centrifuge tube. Refrigerate specimen at 2-8°C.

Units:
   g/L

Reference Interval:
   <0.12 g/L

Reported:
   3-5 days

Additional Information:
   If immunofixation (IFE) for a cryoglobulin is requested, a quantitative cryoglobulin is run first to determine whether the quantity of cryoprecipitate is sufficient for IFE analysis. Samples are held for a minimum of 72 hours after receipt before the analysis for cryoglobulin is performed. Cryoglobulinemias are generally classified as:

   **Type I**: Monoclonal antibodies, associated most often with myeloma or lymphoproliferative disorders, and highly correlated with the development of renal disease.

   **Type II**: Most commonly found, these are mixtures of mono- and polyclonal antibodies, and are associated with the various connective tissue diseases and, especially, chronic infection with Hepatitis C, which should be sought in any case of cryoglobulinemia. The cryoglobulin often recognizes portions of the HCV protein envelope and the cryoprecipitates are rich in virus.

   **Type III**: Polyclonal antibodies, associated mainly with lupus erythematosus.


Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
   82784

LDT or Modified FDA:
   Yes

LOINC Codes:
   2168-3
### Cryopreservation of cells

**CYTOFZ**

<table>
<thead>
<tr>
<th><strong>ORDERING</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Available Stat:</strong></td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
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<tr>
<td><strong>Additional Information:</strong></td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th><strong>COLLECTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Type:</strong></td>
</tr>
<tr>
<td><strong>Unacceptable Conditions:</strong></td>
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<thead>
<tr>
<th><strong>PROCESSING</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>Test Code:</strong></td>
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<tr>
<td><strong>Performing Lab:</strong></td>
</tr>
<tr>
<td><strong>Specimen Preparation:</strong></td>
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<tr>
<td><strong>Unacceptable Conditions:</strong></td>
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<table>
<thead>
<tr>
<th><strong>RESULT INTERPRETATION</strong></th>
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<tbody>
<tr>
<td><strong>Additional Information:</strong></td>
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<td><strong>Performing Lab:</strong></td>
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</table>
Methodology:
Freezing cells at -70°C

Sample Type:
Cultured cells from amniocentesis, chorionic villus sampling, and solid unfixed tissue samples.

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
Refer any questions to Cytogenetics. This test will only be ordered by Cytogenetics staff

Synonyms:
• Cell freezing

Additional Information:
The Cytogenetics Lab does not have the capability of long term cryogenics. Cells may no longer be available after 12 months of storage at -80°C. Recovery rate is dependent on the age and quality of the cultures at the time of storage.

CPT Codes:
88240
Cryptococcal antigen
P253

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
CSF: Daily, day and evening shifts until 9 PM
Serum: Once daily on day shift
Methodology:
Lateral flow assay
Reported:
1 day
Additional Information:
Call Microbiology (x3-1268) for assistance with interpretation.
Order Bacterial Culture, CSF in conjunction with initial CSF cryptococcal antigen test.
Serum specimens are repeated at 7-day intervals and CSF at 2-day intervals, whether previously positive or negative.
Reflex Testing:
Positive results are titered at a separate charge (B254).
Synonyms:
- CRAG
- Cryptococcus latex agglutination

COLLECTION

Sample Type:
Serum, CSF
Collect:
Gold top, CSF tube or sterile collection tube
Amount to Collect:
2 mL blood or 1 mL CSF
Preferred Volume:
1 mL serum or CSF
Stability (from collection to initiation):
Refrigerated 3 days, frozen 2 weeks
Unacceptable Conditions:
More than one serum in one week or more than one CSF in 48 hours.

PROCESSING

Test Code:
P253
Test Group:
Cryptococcus neoformans
Performing Lab:
Microbiology
Preferred Volume:
1 mL serum or CSF
Unacceptable Conditions:
More than one serum in one week or more than one CSF in 48 hours.

Stability (from collection to initiation):
Refrigerated 3 days, frozen 2 weeks

RESULT INTERPRETATION

Reference Interval:
Negative

Critical Values:
Positive results from CSF.

Additional Information:
Call Microbiology (x3-1268) for assistance with interpretation.

Order Bacterial Culture, CSF in conjunction with initial CSF cryptococcal antigen test.

Serum specimens are repeated at 7-day intervals and CSF at 2-day intervals, whether previously positive or negative.

ADMINISTRATIVE

CPT Codes:
87899

LOINC Codes:
38390-1

COMPLETE VIEW

Available Stat:
No

Test Code:
P253

Test Group:
Cryptococcus neoformans

Performing Lab:
Microbiology

Performed:
CSF: Daily, day and evening shifts until 9 PM
Serum: Once daily on day shift

Methodology:
Lateral flow assay

Collect:
Gold top, CSF tube or sterile collection tube

Amount to Collect:
2 mL blood or 1 mL CSF

Sample Type:
Serum, CSF

Preferred Volume:
1 mL serum or CSF

Unacceptable Conditions:
More than one serum in one week or more than one CSF in 48 hours.

Reference Interval:
Negative

Critical Values:
Positive results from CSF.

Synonyms:

- CRAG
- Cryptococcus latex agglutination

**Stability (from collection to initiation):**
- Refrigerated 3 days, frozen 2 weeks

**Reported:**
- 1 day

**Reflex Testing:**
- Positive results are titered at a separate charge (B254).

**Additional Information:**
- Call Microbiology (x3-1268) for assistance with interpretation.
- Order Bacterial Culture, CSF in conjunction with initial CSF cryptococcal antigen test.
- Serum specimens are repeated at 7-day intervals and CSF at 2-day intervals, whether previously positive or negative.

**CPT Codes:**
- 87899

**LOINC Codes:**
- 38390-1
Crystals, duodenal fluid or bile

CBD

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
Test run 0800-2400 daily
Reported:
4 hours
Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

COLLECTION

Sample Type:
Duodenal Fluid or Bile
Collect:
Red top
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL fluid
Remarks:
Deliver to laboratory immediately. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code:
CBD
Test Group:
Crystals
Performing Lab:
Parnassus & Mission Bay Hematology
Preferred Volume:
1 mL fluid

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
89060
LOINC Codes:
Available Stat: No
Test Code: CBD
Test Group: Crystals
Performing Lab: Parnassus & Mission Bay Hematology
Performed: Test run 0800-2400 daily
Remarks: Deliver to laboratory immediately. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect: Red top
Amount to Collect: See preferred volume
Sample Type: Duodenal Fluid or Bile
Preferred Volume: 1 mL fluid
Reference Interval: Negative
Reported: 4 hours
Additional Information: If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for
CPT Codes: 89060
LOINC Codes: 5780-2
Crystals, synovial fluid
CJF

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
Test run 0800-2400 daily
Methodology:
Compensated Polarized Light Microscopy
Reported:
4 hours
Additional Information:
There is a > 95% chance of detecting intraleukocytic urate crystals in an acutely gouty joint (and in approx. 75% of asymptomatic patients); the few negative fluids are usually positive on repeat aspiration a few hours later. False positive results can occur due to the similar needle- or rod-like shape and birefringence seen occasionally w/ cholesterol crystals or w/ crystalline preparations of corticosteroids such as betamethasone and triamcinolone. Cartilage fragments and calcium oxalate crytals can also be birefringent, but are usually distinguishable from urates by careful attention to morphologic details. Generally more rectangular birefringent pyrophosphate crystals are seen in other arthritides.

Lithium heparin (light green top) may cause false positive crystal formation.

Based on a small in-house study the effect of storage on joint crystals was examined. Calcium pyrophosphate dehydrate (CPPD) crystals dissolve after several hours. Refrigeration did not prevent CPPD crystals from dissolution. However, Monosodium Urate (MSU) crystals did not decrease in numbers significantly over the first few days, but decrease over a period of weeks. Refrigeration appeared to slow the dissolution of MSU crystals.

Samples for Particle Disease - Particle disease is a byproduct of the increasing use of prosthesis for joint replacement in patients with chronic arthritis. Looking at joint fluid for particles is not ideal for diagnosis of "particle disease", but is the simplest means of obtaining a sample (much easier than biopsy of tissue around the prosthetic joint).

Synonyms:
- Gout
- Uric acid
- Pseudogout
- Calcium pyrophosphate dehydrogenase
- CPPD
- joint fluid

COLLECTION

Sample Type:
Synovial fluid
Collect:
Lavender or Dark Green top
Amount to Collect:
See preferred volume
Preferred Volume:
1 ml fluid
Remarks:
Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.

Bring samples asap to laboratory for testing.
Stability (from collection to initiation):
4 hours at room temperature

Unacceptable Conditions:
Samples in syringes with needle still attached.

Samples received four (4) or more hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Calcium pyrophosphate dehydrate (CPPD) crystals dissolve with time, therefore false negatives can occur. Uric acid crystals are stable for several weeks. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.

PROCESSING

Test Code: CJF
Performing Lab: Parnassus & Mission Bay Hematology
Specimen Preparation:
Deliver sample to Hematology immediately after sample is received and entered in Sunquest.
Preferred Volume:
1 ml fluid
Unacceptable Conditions:
Samples in syringes with needle still attached.

Samples received four (4) or more hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Calcium pyrophosphate dehydrate (CPPD) crystals dissolve with time, therefore false negatives can occur. Uric acid crystals are stable for several weeks. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.

Stability (from collection to initiation):
4 hours at room temperature

RESULT INTERPRETATION

Reference Interval:
None
Additional Information:

There is a > 95% chance of detecting intraleukocytic urate crystals in an acutely gouty joint (and in approx. 75% of asymptomatic patients); the few negative fluids are usually positive on repeat aspiration a few hours later. False positive results can occur due to the similar needle- or rod-like shape and birefringence seen occasionally w/ cholesterol crystals or w/ crystalline preparations of corticosteroids such as betamethasone and triamcinolone. Cartilage fragments and calcium oxalate crytals can also be birefringent, but are usually distinguishable from urates by careful attention to morphologic details. Generally more rectangular birefringent pyrophosphate crystals are seen in other arthritides.

Lithium heparin (light green top) may cause false positive crystal formation.

Based on a small in-house study the effect of storage on joint crystals was examined. Calcium pyrophosphate dehydrate (CPPD) crystals dissolve after several hours. Refrigeration did not prevent CPPD crystals from dissolution. However, Monosodium Urate (MSU) crystals did not decrease in numbers significantly over the first few days, but decrease over a period of weeks. Refrigeration appeared to slow the dissolution of MSU crystals.

Samples for Particle Disease - Particle disease is a byproduct of the increasing use of prosthesis for joint replacement in patients with chronic arthritis. Looking at joint fluid for particles is not ideal for diagnosis of “particle disease”, but is the simplest means of obtaining a sample (much easier than biopsy of tissue around the prosthetic joint).

ADMINISTRATIVE

CPT Codes:
89060
LOINC Codes:
5781-0
Available Stat: No
Test Code: CJF
Performing Lab: Parnassus & Mission Bay Hematology
Performed: Test run 0800-2400 daily
Methodology: Compensated Polarized Light Microscopy
Remarks: Specimen label must contain the date and time the sample was collected and the legible name of the person who collected the sample.
Bring samples asap to laboratory for testing.
Collect: Lavender or Dark Green top
Amount to Collect: See preferred volume
Sample Type: Synovial fluid
Preferred Volume: 1 ml fluid
Unacceptable Conditions: Samples in syringes with needle still attached.
Samples received four (4) or more hours after collection are accepted but results modified as follows: “Sample stability period exceeded or collection time unknown. Calcium pyrophosphate dehydrate (CPPD) crystals dissolve with time, therefore false negatives can occur. Uric acid crystals are stable for several weeks. See Lab Manual for Moffitt-Long and Mt. Zion for more information”.
Specimen Preparation: Deliver sample to Hematology immediately after sample is received and entered in Sunquest.
Reference Interval: None
Synonyms:
- Gout
- Uric acid
- Pseudogout
- Calcium pyrophosphate dehydrogenase
- CPPD
- joint fluid
Stability (from collection to initiation): 4 hours at room temperature
Reported: 4 hours
Additional Information:
There is a > 95% chance of detecting intraleukocytic urate crystals in an acutely gouty joint (and in approx. 75% of asymptomatic patients); the few negative fluids are usually positive on repeat aspiration a few hours later. False positive results can occur due to the similar needle- or rod-like shape and birefringence seen occasionally w/ cholesterol crystals or w/ crystalline preparations of corticosteroids such as betamethasone and triamcinolone. Cartilage fragments and calcium oxalate crystals can also be birefringent, but are usually distinguishable from urates by careful attention to morphologic details. Generally more rectangular birefringent pyrophosphate crystals are seen in other arthritides.
Lithium heparin (light green top) may cause false positive crystal formation.
Based on a small in-house study the effect of storage on joint crystals was examined. Calcium pyrophosphate dehydrate (CPPD)
crystals dissolve after several hours. Refrigeration did not prevent CPPD crystals from dissolution. However, Monosodium Urate (MSU) crystals did not decrease in numbers significantly over the first few days, but decrease over a period of weeks. Refrigeration appeared to slow the dissolution of MSU crystals.

Samples for Particle Disease - Particle disease is a byproduct of the increasing use of prosthesis for joint replacement in patients with chronic arthritis. Looking at joint fluid for particles is not ideal for diagnosis of “particle disease”, but is the simplest means of obtaining a sample (much easier than biopsy of tissue around the prosthetic joint).

**CPT Codes:**
- 89060

**LOINC Codes:**
- 5781-0
CSF Fungal Culture for Coccidiodes
P256N

ORDERING

Ordering Recommendations:

For diagnosis of yeast and Cryptococcal meningitis, recommended tests are: CSF bacterial culture (yeast, including Cryptococcus neoforans grow well on routine bacterial culture) CSF and serum Cryptococcal Antigen (CrAg)

Sensitivity of CSF Culture for Coccidiodes immitis is limited. Serum and / or CSF serology for Coccidioides (Coccidioides immitis Antibody, Immunodiffusion) are more sensitive than culture and are the recommended first-line diagnostic tests.

The yield of CSF cultures for other dimorphic fungi and invasive molds, including Aspergillus, Blastomyces, Histoplasma and the Zygomyces (Mucor and Rhizopus) is extremely low. Tissue biopsy, if possible, is the recommended specimen for fungal diagnosis by culture.

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Culture
Reported:
Up to 30 days
Additional Information:
Differentiation of Candida dublinensis from the biochemically and clinically similar species Candida albicans is performed on request only.
Synonyms:
- C. immitis
- San Joaquin valley Fever

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
5-10 mL CSF
Preferred Volume:
5-10 mL CSF
Minimum Volume:
5 mL CSF
Stability (from collection to initiation):
Refrigerated 24 hours

PROCESSING

Test Code:
P256N
Test Group:
Fungal
Performing Lab:
Microbiology
Preferred Volume:
5-10 mL CSF
Minimum Volume:
5 mL CSF
Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Reference Interval:
No Coccidioides isolated
Critical Values:
Positive culture
Additional Information:
Differentiation of Candida dublinensis from the biochemically and clinically similar species Candida albicans is performed on request only.

ADMINISTRATIVE

CPT Codes:
87102

COMPLETE VIEW

Available Stat:
No
Ordering Recommendations:
For diagnosis of yeast and Cryptococcal meningitis, recommended tests are: CSF bacterial culture (yeast, including Cryptococcus neoformans grow well on routine bacterial culture) CSF and serum Cryptococcal Antigen (CrAg)

Sensitivity of CSF Culture for Coccidioides immitis is limited. Serum and / or CSF serology for Coccidioides (Coccidioides immitis Antibody, Immunodiffusion) are more sensitive than culture and are the recommended first-line diagnostic tests.

The yield of CSF cultures for other dimorphic fungi and invasive molds, including Aspergillus, Blastomyces, Histoplasma and the Zygomycetes (Mucor and Rhizopus) is extremely low. Tissue biopsy, if possible, is the recommended specimen for fungal diagnosis by culture.

Test Code:
P256N
Test Group:
Fungal
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Culture
Collect:
CSF tube or sterile collection tube
Amount to Collect:
5-10 mL CSF
Sample Type:
CSF
Preferred Volume:
5-10 mL CSF
Minimum Volume:
5 mL CSF

Test information subject to change
Reference Interval:
   No Coccidioides isolated

Critical Values:
   Positive culture

Synonyms:
   - C. immitis
   - San Joaquin valley Fever

Stability (from collection to initiation):
   Refrigerated 24 hours

Reported:
   Up to 30 days

Additional Information:
   Differentiation of Candida dublinensis from the biochemically and clinically similar species Candida albicans is performed on request only.

CPT Codes:
   87102
C-telopeptide
CTX

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Electrochemiluminescent Immunoassay
Reported:
5-7 days
Synonyms:
- CTx
- Collagen Type I
- Bone markers
- osteoporosis

COLLECTION

Patient Preparation:
Fasting morning collection 8-10 am. (Diurnal variations cause elevated levels at night.) Minimum of 12 hours fasting is required.
Sample Type:
Serum
Collect:
Red top, (Gold top acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 16 hours, refrigerated 3 days, frozen 3 months.

PROCESSING

Test Code:
CTX
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge and separate the serum from the cells. Freeze as soon as possible.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 16 hours, refrigerated 3 days, frozen 3 months.
RESULT INTERPRETATION

Units: pg/mL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9 years</td>
<td>574-1849 pg/mL</td>
<td>574-1849 pg/mL</td>
</tr>
<tr>
<td>10-13 years</td>
<td>519-2415 pg/mL</td>
<td>519-2415 pg/mL</td>
</tr>
<tr>
<td>14-17 years</td>
<td>435-2924 pg/mL</td>
<td>242-1291 pg/mL</td>
</tr>
</tbody>
</table>

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<tr>
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<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29 years</td>
<td>87-1200 pg/mL</td>
<td>64-640 pg/mL</td>
</tr>
<tr>
<td>30-39 years</td>
<td>70-780 pg/mL</td>
<td>60-650 pg/mL</td>
</tr>
<tr>
<td>40-49 years</td>
<td>60-700 pg/mL</td>
<td>40-465 pg/mL</td>
</tr>
<tr>
<td>50-68 years</td>
<td>87-345 pg/mL</td>
<td>Not available</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes: 82523-90

COMPLETE VIEW

Available Stat: No

Test Code: CTX

Performing Lab: Quest

Sendout: Yes

Methodology: Electrochemiluminescent Immunoassay

Patient Preparation: Fasting morning collection 8-10 am. (Diurnal variations cause elevated levels at night.) Minimum of 12 hours fasting is required.

Collect: Red top. (Gold top acceptable)

Amount to Collect: 2 mL blood

Sample Type: Serum

Preferred Volume: 1 mL serum

Minimum Volume: 0.5 mL serum

Specimen Preparation: Centrifuge and separate the serum from the cells. Freeze as soon as possible.

Units: pg/mL

Reference Interval:

<table>
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<tr>
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<th>Females</th>
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<tr>
<td></td>
<td>50-68 years</td>
<td>87-345 pg/mL</td>
<td>Not available</td>
</tr>
</tbody>
</table>

**Synonyms:**
- CTx
- Collagen Type I
- Bone markers
- Osteoporosis

**Stability (from collection to initiation):**
Room temperature 16 hours, refrigerated 3 days, frozen 3 months.

**Reported:**
5-7 days

**CPT Codes:**
82523-90
Cutaneous Antibodies

**ORDERING**

Available Stat:
No
Performing Lab:
UCSF IF Lab
Performed:
Daily, Monday-Friday
Methodology:
Indirect immunofluorescence
Reported:
3-5 days
Additional Information:
Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive, it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy.

Synonyms:
- Blistering diseases
- blistering disorders
- BMZ antibodies
- Bullous disease
- Cutaneous immunofluorescent antibodies
- basement membrane antibodies
- epidermolysis bullosa aquisita
- fluorescent antibodies for bullous disease
- Pemphigoid
- pemphigus

**COLLECTION**

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Remarks:
Complete Dermatopathology requisition and submit with sample. Samples should be received by the laboratory by Wednesday for next Monday signout.

**PROCESSING**

Test Code:
No test code, see Processing instructions
Sendout:
Yes

Performing Lab:
UCSF IF Lab

Specimen Preparation:
Store and transport at room temperature. Send sample and completed dermatopathology requisition to: UCSF Dermatopathology office, Mount Zion Campus, 1701 Divisadero St., 3rd floor Room 350, San Francisco, CA 94115. For questions contact the UCSF Immunofluorescence Lab at 353-7546.

Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Units:
titer
Reference Interval:
Negative titer < 1:10
Additional Information:
Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive, it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy.

COMPLETE VIEW

Available Stat:
No
Test Code:
No test code, see Processing instructions
Performing Lab:
UCSF IF Lab
Sendout:
Yes
Performed:
Daily, Monday-Friday
Methodology:
Indirect immunofluorescence
Remarks:
Complete Dermatopathology requisition and submit with sample. Samples should be received by the laboratory by Wednesday for next Monday signout.
Collect:
Gold top
Amount to Collect:
4 mL blood
Sample Type:
Serum
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Specimen Preparation:
Store and transport at room temperature. Send sample and completed dermatopathology requisition to: UCSF Dermatopathology office, Mount Zion Campus, 1701 Divisadero St., 3rd floor Room 350, San Francisco, CA 94115. For questions contact the UCSF Immunofluorescence Lab at 353-7546.

Units:
**titer**

**Reference Interval:**
- Negative titer < 1:10

**Synonyms:**
- Blistering diseases
- blistering disorders
- BMZ antibodies
- Bullous disease
- Cutaneous immunofluorescent antibodies
- basement membrane antibodies
- epidermolysis bullosa aquisita
- fluorescent antibodies for bullous disease
- Pemphigoid
- pemphigus

**Reported:**
- 3-5 days

**Additional Information:**
Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive, it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy.
Cyanide

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Colorimetric
Reported: Test run Monday, Wednesday, Friday. Turnaround time: 4-6 days
Additional Information: The detection limit of this assay is 0.1 mg/L
Toxic syndromes are rapid and include flushing, headache, dizziness, and tachypnea that may progress to respiratory depression and death.
80% of cyanide is converted to thiocyanate. Administration of sodium nitroprusside contributes to the total body pool of cyanide and complicates interpretation.
Synonyms:
- Hydrogen cyanide
- Cn
- Hydrocyanic acid
- Prussic acid

COLLECTION

Sample Type: Heparinized whole blood
Collect: Dark Green top (Sodium Heparin)
Amount to Collect: 10 mL blood
Preferred Volume: 10 mL blood
Minimum Volume: 1 mL blood
Stability (from collection to initiation): Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code: CYAN
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Do NOT centrifuge or open tube. Order Quest # 400
Preferred Volume: 10 mL blood
Minimum Volume:
1 mL blood

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Normal: < 0.1 mg/L
Potentially toxic: > 0.5 mg/L

Critical Values:
Quest Priority-1: >= 1.0 mg/L
Quest Priority-2: 0.5-0.9 mg/L

Additional Information:
The detection limit of this assay is 0.1 mg/L

Toxic syndromes are rapid and include flushing, headache, dizziness, and tachypnea that may progress to respiratory depression and death.

80% of cyanide is converted to thiocyanate. Administration of sodium nitroprusside contributes to the total body pool of cyanide and complicates interpretation.

ADMINISTRATIVE

CPT Codes:
82600-90

LOINC Codes:
5634-1

COMPLETE VIEW

Available Stat:
No

Test Code:
CYAN

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Colorimetric

Collect:
Dark Green top (Sodium Heparin)

Amount to Collect:
10 mL blood

Sample Type:
Heparinized whole blood

Preferred Volume:
10 mL blood

Minimum Volume:
1 mL blood

Specimen Preparation:
Refrigerate. Do NOT centrifuge or open tube. Order Quest # 400

Units:
mg/L

**Reference Interval:**
- Normal: < 0.1 mg/L
- Potentially toxic: > 0.5 mg/L

**Critical Values:**
- Quest Priority-1: >= 1.0 mg/L
- Quest Priority-2: 0.5-0.9 mg/L

**Synonyms:**
- Hydrogen cyanide
- Cn
- Hydrocyanic acid
- Prussic acid

**Stability (from collection to initiation):**
- Room temperature 2 weeks, refrigerated 2 weeks, frozen at -20°C 1 month.

**Reported:**
- Test run Monday, Wednesday, Friday. Turnaround time: 4-6 days

**Additional Information:**
- The detection limit of this assay is 0.1 mg/L
- Toxic syndromes are rapid and include flushing, headache, dizziness, and tachypnea that may progress to respiratory depression and death.
- 80% of cyanide is converted to thiocyanate. Administration of sodium nitroprusside contributes to the total body pool of cyanide and complicates interpretation.

**CPT Codes:**
- 82600-90

**LOINC Codes:**
- 5634-1
Cyclosporine A

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Daily (day shift)
Methodology:
Abbott Architect Chemiluminescent Immunoassay
Reported:
Specimens received in the laboratory by 1200 (Monday-Friday) and by 1000 (weekends and holidays) will have results available by 1600 the same day.
Additional Information:
Generally recommended therapeutic trough levels vary between 50 to 500. However, there is no universally accepted therapeutic level and the desired concentrations may vary with the indications, e.g., higher for liver than for renal transplantation, higher early in the post-transplant period, higher in threatened or subacute rejection. In a patient who is doing well following liver transplantation a level of 250-300 might be sought for the first 3-4 months, 150-250 for 4 months - 12 months, and lowered to 100-150 after one year, whereas post-renal transplant a well-compensated patient might be kept at 150-300 for 6 months, then reduced to 50-150. The level usually desirable for any given patient may also be adjusted because of intercurrent illness. The current therapeutic range was established in consultation with UCSF transplant physicians and clinical pharmacists.

The Abbott Architect immunoassay for cyclosporine is reported by the manufacturer to show little or no cross reactivity with the major cyclosporine metabolites. Results with this immunoassay run approximately 30% higher than results with the previous HPLC assay mainly due to assay calibration differences. See the lab manual’s “A Guide on Drug Level Monitoring” (in the Chemistry Guide) for additional information.

Synonyms:
- Neoral
- cyclosporin
- CSA
- Gengraf
- Sandimmune

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
1 mL blood
NOTE: This should be submitted as a unique, separate sample for testing.
Preferred Volume:
1 mL blood
NOTE: This should be submitted as a unique, separate sample for testing.
Minimum Volume:
0.5 mL blood
NOTE: This should be submitted as a unique, separate sample for testing and this minimum volume does not allow for repeat testing if needed.
Remarks:
Time to steady state: 2-5 days

Draw trough samples only (24 hours post dose or just prior to next dose) or normal ranges will not apply.

This very non-polar compound adheres tenaciously to plastic; samples should not be drawn from any line through which the drug has been infused but only from a peripheral site.

**NOTE:** To avoid testing delays and the possibility of QNS samples, blood for Cyclosporin should be collected as a separate sample. The sample should not be shared for any other test(s).

### PROCESSING

**Test Code:**

CYCL

**Performing Lab:**

China Basin Chemistry

**Specimen Preparation:**

Do not centrifuge

**Preferred Volume:**

1 mL blood

**NOTE:** This should be submitted as a unique, separate sample for testing.

**Minimum Volume:**

0.5 mL blood

**NOTE:** This should be submitted as a unique, separate sample for testing and this minimum volume does not allow for repeat testing if needed.

### RESULT INTERPRETATION

**Units:**

µg/L

**Reference Interval:**

Therapeutic trough 50-500 µg/L

**Additional Information:**

Generally recommended therapeutic trough levels vary between 50 to 500. However, there is no universally accepted therapeutic level and the desired concentrations may vary with the indications, e.g., higher for liver than for renal transplantation, higher early in the post-transplant period, higher in threatened or subacute rejection. In a patient who is doing well following liver transplantation a level of 250-300 might be sought for the first 3-4 months, 150-250 for 4 months - 12 months, and lowered to 100-150 after one year, whereas post-renal transplant a well-compensated patient might be kept at 150-300 for 6 months, then reduced to 50-150. The level usually desirable for any given patient may also be adjusted because of intercurrent illness. The current therapeutic range was established in consultation with UCSF transplant physicians and clinical pharmacists.

The Abbott Architect immunoassay for cyclosporine is reported by the manufacturer to show little or no cross reactivity with the major cyclosporine metabolites. Results with this immunoassay run approximately 30% higher than results with the previous HPLC assay mainly due to assay calibration differences. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

### ADMINISTRATIVE

**CPT Codes:**

80158

**LOINC Codes:**

3520-4

### COMPLETE VIEW

**Available Stat:**
Test Code: CYCL
Performing Lab: China Basin Chemistry
Performed: Daily (day shift)
Methodology: Abbott Architect Chemiluminescent Immunoassay
Remarks:
Time to steady state: 2-5 days
Draw trough samples only (24 hours post dose or just prior to next dose) or normal ranges will not apply.
This very non-polar compound adheres tenaciously to plastic; samples should not be drawn from any line through which the drug has been infused but only from a peripheral site.
NOTE: To avoid testing delays and the possibility of QNS samples, blood for Cyclosporin should be collected as a separate sample. The sample should not be shared for any other test(s).
Collect:
Lavender top
Amount to Collect:
1 mL blood
NOTE: This should be submitted as a unique, separate sample for testing.
Sample Type:
EDTA whole blood
Preferred Volume:
1 mL blood
NOTE: This should be submitted as a unique, separate sample for testing.
Minimum Volume:
0.5 mL blood
NOTE: This should be submitted as a unique, separate sample for testing and this minimum volume does not allow for repeat testing if needed.
Specimen Preparation:
Do not centrifuge
Units:
µg/L
Reference Interval:
Therapeutic trough 50-500 µg/L
Synonyms:
• Neoral
• cyclosporin
• CSA
• Gengraf
• Sandimmune
Reported:
Specimens received in the laboratory by 1200 (Monday.-Friday) and by 1000 (weekends and holidays) will have results available by 1600 the same day.
Additional Information:
Generally recommended therapeutic trough levels vary between 50 to 500. However, there is no universally accepted therapeutic level and the desired concentrations may vary with the indications, e.g., higher for liver than for renal transplantation, higher early in the post-transplant period, higher in threatened or subacute rejection. In a patient who is doing well following liver transplantation a level of 250-300 might be sought for the first 3-4 months, 150-250 for 4 months - 12 months, and lowered to 100-150 after one year, whereas post-renal transplant a well-compensated patient might be kept at 150-300 for 6 months, then reduced to 50-150. The level usually desirable
for any given patient may also be adjusted because of intercurrent illness. The current therapeutic range was established in consultation
with UCSF transplant physicians and clinical pharmacists.

The Abbott Architect immunoassay for cyclosporine is reported by the manufacturer to show little or no cross reactivity with the major
cyclosporine metabolites. Results with this immunoassay run approximately 30% higher than results with the previous HPLC assay
mainly due to assay calibration differences. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for
additional information.

CPT Codes:
80158

LOINC Codes:
3520-4
CYP2C19 Genotype
2C19G

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: PCR
Reported: 4-8 days
Synonyms:
- Cytochrome P450 2C19
- Plavix

COLLECTION

Sample Type: EDTA or heparinized whole blood
Collect: Lavender top, Dark green top
Amount to Collect: 4 mL blood
Preferred Volume: 4 mL blood
Minimum Volume: 2 mL blood
Stability (from collection to initiation):
Room temperature 8 days, Refrigerated 1 month

PROCESSING

Test Code: 2C19G
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Do not aliquot sample. Transport to CB & Quest at ambient temperature. Order Quest test code 16924.
Preferred Volume: 4 mL blood
Minimum Volume: 2 mL blood
Stability (from collection to initiation):
Room temperature 8 days, Refrigerated 1 month

ADMINISTRATIVE

CPT Codes: 81225-90
Available Stat:
No
Test Code:
2C19G
Performing Lab:
Quest
Sendout:
Yes
Methodology:
PCR
Collect:
Lavender top, Dark green top
Amount to Collect:
4 mL blood
Sample Type:
EDTA or heparinized whole blood
Preferred Volume:
4 mL blood
Minimum Volume:
2 mL blood
Specimen Preparation:
Do not aliquot sample. Transport to CB & Quest at ambient temperature. Order Quest test code 16924.
Synonyms:
- Cytochrome P450 2C19
- Plavix
Stability (from collection to initiation):
Room temperature 8 days, Refrigerated 1 month
Reported:
4-8 days
CPT Codes:
81225-90
CYP2C9 Genotype
2C9G

ORDERING

Performing Lab: Quest
Performed: Thursdays
Methodology: PCR, Single nucleotide primer extension
Reported: 7 days
Synonyms: 
- Cytochrome p450 2C9 Genotype

COLLECTION

Sample Type: Blood
Collect: Lavender (EDTA) top
Amount to Collect: 5 mL
Preferred Volume: 5 mL
Minimum Volume: 3 mL
Stability (from collection to initiation): 8 days ambient or refrigerated. Unacceptable frozen.
Storage/Transport Temperature: Refrigerated
Unacceptable Conditions: Frozen

PROCESSING

Test Code: 2C9G
Sendout: Yes
Performing Lab: Quest
Preferred Volume: 5 mL
Minimum Volume: 3 mL
Unacceptable Conditions: Frozen
Stability (from collection to initiation): 8 days ambient or refrigerated. Unacceptable frozen.
Storage/Transport Temperature: Refrigerated
**ADMINISTRATIVE**

CPT Codes:
81227

LOINC Codes:
46724-1

**COMPLETE VIEW**

Test Code:
2C9G

Performing Lab:
Quest

Sendout:
Yes

Performed:
Thursdays

Methodology:
PCR, Single nucleotide primer extension

Collect:
Lavender (EDTA) top

Amount to Collect:
5 mL

Sample Type:
Blood

Preferred Volume:
5 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Frozen

Synonyms:
- Cytochrome p450 2C9 Genotype

Storage/Transport Temperature:
Refrigerated

Stability (from collection to initiation):
8 days ambient or refrigerated. Unacceptable frozen.

Reported:
7 days

CPT Codes:
81227

LOINC Codes:
46724-1
CYP2D6 Genotype
2D6G

ORDERING

Performing Lab: Quest
Performed: Monday and Thursday
Methodology: Polymerase Chain Reaction (PCR) • Single Nucleotide Primer Extension Reaction (SNP-IT)
Reported: 10-12 days

Additional Information:
The CYP2D6 gene product is responsible for the metabolism of many major drug groups including many antidepressants, neuroleptics, and cardiovascular drugs. Cytochrome 450 2D6 Genotype detects eight alleles associated with the poor metabolizer phenotype (PM). Patients with duplication of the CYP2D6 gene are ultraextensive metabolizers (UEM). Approximately 5-10% of Caucasian individuals express PM phenotype and the same percentage the UEM phenotype.
Synonyms:
- Cytochrome p450 2d6 Genotype

COLLECTION

Sample Type: Whole blood
Collect: EDTA Lavender-top tube
Amount to Collect: 5 mL
Preferred Volume: 5 mL
Minimum Volume: 3 mL

Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable

Storage/Transport Temperature: Refrigerated

Unacceptable Conditions:
- Wrong specimen type
- Received Frozen
- Exceeds specimen stability
- QNS

PROCESSING

Test Code: 2D6G
Sendout: Yes
Performing Lab: Quest
Preferred Volume: 5 mL
Minimum Volume: 3 mL
Unacceptable Conditions:
- Wrong specimen type
- Received Frozen
- Exceeds specimen stability
- QNS

Stability (from collection to initiation):
- Room temperature: 8 days
- Refrigerated: 8 days
- Frozen: Unacceptable

Storage/Transport Temperature:
- Refrigerated

RESULT INTERPRETATION

Additional Information:
The CYP2D6 gene product is responsible for the metabolism of many major drug groups including many antidepressants, neuroleptics, and cardiovascular drugs. Cytochrome 450 2D6 Genotype detects eight alleles associated with the poor metabolizer phenotype (PM). Patients with duplication of the CYP2D6 gene are ultraextensive metabolizers (UEM). Approximately 5-10% of Caucasian individuals express PM phenotype and the same percentage the UEM phenotype.

ADMINISTRATIVE

CPT Codes:
- 81226

COMPLETE VIEW

Test Code:
- 2D6G
Performing Lab:
- Quest
Sendout:
- Yes
Performed:
- Monday and Thursday
Methodology:
- Polymerase Chain Reaction (PCR) • Single Nucleotide Primer Extension Reaction (SNP-IT)
Collect:
- EDTA Lavender-top tube
Amount to Collect:
- 5 mL
Sample Type:
- Whole blood
Preferred Volume:
- 5 mL
Minimum Volume:
- 3 mL
Unacceptable Conditions:
- Wrong specimen type
- Received Frozen
- Exceeds specimen stability
- QNS
Synonyms:
- Cytochrome p450 2d6 Genotype
Storage/Transport Temperature:
- Refrigerated
Stability (from collection to initiation):
- Room temperature: 8 days
- Refrigerated: 8 days
- Frozen: Unacceptable
Reported:
- 10-12 days
Additional Information:

The CYP2D6 gene product is responsible for the metabolism of many major drug groups including many antidepressants, neuroleptics, and cardiovascular drugs. Cytochrome 450 2D6 Genotype detects eight alleles associated with the poor metabolizer phenotype (PM). Patients with duplication of the CYP2D6 gene are ultraextensive metabolizers (UEM). Approximately 5-10% of Caucasian individuals express PM phenotype and the same percentage the UEM phenotype.

CPT Codes:

81226
CYP3A4 Genotype

ORDERING

Performing Lab: Quest
Performed: Wednesday
Methodology: Single Nucleotide Primer Extension
Reported: 9-16 days

Additional Information:
CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions. Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help to avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

COLLECTION

Sample Type: Whole blood
Collect:
EDTA Lavender-top tube
Amount to Collect:
4 mL
Preferred Volume:
4 mL
Minimum Volume:
2 mL
Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable
Storage/Transport Temperature:
Refrigerated
Unacceptable Conditions:
Incorrect collection device • Liquid has leaked from container • No liquid present • Blood sample received frozen • Buccal swabs received refrigerated or frozen

PROCESSING

Test Code: 3A4G
Sendout: Yes
Performing Lab: Quest
Preferred Volume:
4 mL
Minimum Volume:
2 mL
Unacceptable Conditions:
  - Incorrect collection device
  - Liquid has leaked from container
  - No liquid present
  - Blood sample received frozen
  - Buccal swabs received refrigerated or frozen

Stability (from collection to initiation):
  - Room temperature: 8 days
  - Refrigerated: 8 days
  - Frozen: Unacceptable

Storage/Transport Temperature:
  - Refrigerated

RESULT INTERPRETATION

Additional Information:
  - CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions.
  - Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help to avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

ADMINISTRATIVE

CPT Codes:
  - 81230

COMPLETE VIEW

Test Code:
  - 3A4G

Performing Lab:
  - Quest

Sendout:
  - Yes

Performed:
  - Wednesday

Methodology:
  - Single Nucleotide Primer Extension

Collect:
  - EDTA Lavender-top tube

Amount to Collect:
  - 4 mL

Sample Type:
  - Whole blood

Preferred Volume:
  - 4 mL

Minimum Volume:
  - 2 mL

Unacceptable Conditions:
  - Incorrect collection device
  - Liquid has leaked from container
  - No liquid present
  - Blood sample received frozen
  - Buccal swabs received refrigerated or frozen

Storage/Transport Temperature:
  - Refrigerated

Stability (from collection to initiation):
  - Room temperature: 8 days
  - Refrigerated: 8 days
  - Frozen: Unacceptable

Printed 06/07/19
Test information subject to change
Reported: 9-16 days

Additional Information: CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions. Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help to avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

CPT Codes: 81230
CYP3A5 Genotype
3A5G

ORDERING

Performing Lab:
Quest

Performed:
Wednesday

Methodology:
Single Nucleotide Primer Extension

Reported:
9-16 days

Additional Information:
CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions.

Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

Synonyms:
- Cytochrome p450 3A5 Genotype

COLLECTION

Sample Type:
Whole blood

Collect:
EDTA Lavender-top

Amount to Collect:
4 mL

Preferred Volume:
4 mL

Minimum Volume:
2 mL

Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated

Unacceptable Conditions:
Incorrect collection device • Liquid has leaked from container • No liquid present • Blood sample received frozen • Buccal swabs received refrigerated or frozen

PROCESSING

Test Code:
3A5G

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Do not aliquot. Transport to CB refrigerated. Order Quest test code 91618.
Preferred Volume: 4 mL
Minimum Volume: 2 mL

Unacceptable Conditions:
- Incorrect collection device
- Liquid has leaked from container
- No liquid present
- Blood sample received frozen
- Buccal swabs received refrigerated or frozen

Stability (from collection to initiation):
- Room temperature: 8 days
- Refrigerated: 8 days
- Frozen: Unacceptable

Storage/Transport Temperature:
- Refrigerated

RESULT INTERPRETATION

Additional Information:
CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions. Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

ADMINISTRATIVE

CPT Codes:
81231

COMPLETE VIEW

Test Code:
3A5G
Performing Lab:
Quest
Sendout:
Yes
Performed:
Wednesday
Methodology:
Single Nucleotide Primer Extension
Collect:
EDTA Lavender-top
Amount to Collect:
4 mL
Sample Type:
Whole blood
Preferred Volume:
4 mL
Minimum Volume:
2 mL

Unacceptable Conditions:
- Incorrect collection device
- Liquid has leaked from container
- No liquid present
- Blood sample received frozen
- Buccal swabs received refrigerated or frozen

Specimen Preparation:
Do not aliquot. Transport to CB refrigerated. Order Quest test code 91618.
Synonyms:
- Cytochrome p450 3A5 Genotype

Storage/Transport Temperature:
Refrigerated

Stability (from collection to initiation):
- Room temperature: 8 days
- Refrigerated: 8 days
- Frozen: Unacceptable

Reported:
- 9-16 days

Additional Information:
CYP3A4 and CYP3A5 are liver enzymes that are responsible for metabolizing approximately 50% of small molecule drugs, and their induction often causes unwanted drug-drug interactions and potential toxicities. Variants of CYP3A4/3A5 are associated with significant phenotypic variations that alter the rate of drug metabolism and may cause increased or decreased drug efficacy or adverse drug reactions.
Detecting genetic predisposition to altered CYP3A4/3A5 metabolism may help avoid drug toxicity and can assist the physician with optimizing therapeutic strategies for maximum efficacy and minimal adverse effects.

CPT Codes:
81231
Cystatin C with eGFR

ORDERING

Performing Lab:
  Mayo
Methodology:
  Immunoturbidimetric
Reported:
  3-5 days
Additional Information:
  An index of glomerular filtration rate, especially in patients where serum creatinine may be misleading (eg, very obese, elderly, or malnourished patients)
  Assessing renal function in patients suspected of having kidney disease
  Monitoring treatment response in patients with kidney disease

COLLECTION

Sample Type:
  Serum
Collect:
  Red top or Gold top
Amount to Collect:
  2 mL
Preferred Volume:
  1.0 mL
Minimum Volume:
  0.5 mL
Stability (from collection to initiation):
  7 days (any temperature)
Rejection Criteria:
  Gross Hemolysis

PROCESSING

Test Code:
  CYSTAC
Sendout:
  Yes
Performing Lab:
  Mayo
Specimen Preparation:
  Aliquot specimen and transport to CB ambient. Order Mayo test code CYSTC
Preferred Volume:
  1.0 mL
Minimum Volume:
  0.5 mL
Rejection Criteria:
  Gross Hemolysis
Stability (from collection to initiation):
  7 days (any temperature)
RESULT INTERPRETATION

Units:
mg/L

Reference Interval:

Males:

0 days-22 years: no reference values established
23-29 years: 0.60-1.03 mg/L
30-39 years: 0.64-1.12 mg/L
40-49 years: 0.68-1.22 mg/L
50-59 years: 0.72-1.32 mg/L
60-69 years: 0.77-1.42 mg/L
70-79 years: 0.82-1.52 mg/L
>79 years: no reference values established

Females:

0 days-22 years: no reference values established
23-29 years: 0.57-0.90 mg/L
30-39 years: 0.59-0.98 mg/L
40-49 years: 0.62-1.07 mg/L
50-59 years: 0.64-1.17 mg/L
60-69 years: 0.66-1.26 mg/L
70-80 years: 0.68-1.36 mg/L
81-86 years: 0.70-1.45 mg/L
>86 years: no reference values established

eGFR >60 mL/min/BSA

eGFR will not be calculated for patients under 18 years.

Additional Information:

An index of glomerular filtration rate, especially in patients where serum creatinine may be misleading (eg, very obese, elderly, or malnourished patients)

Assessing renal function in patients suspected of having kidney disease

Monitoring treatment response in patients with kidney disease

ADMINISTRATIVE

CPT Codes:
82610-90

LOINC Codes:
33863-2

COMPLETE VIEW

Test Code:
CYSTAC

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Immunoturbidimetric

Collect:
Red top or Gold top
**Amount to Collect:**
- 2 mL

**Sample Type:**
- Serum

**Preferred Volume:**
- 1.0 mL

**Minimum Volume:**
- 0.5 mL

**Rejection Criteria:**
- Gross Hemolysis

**Specimen Preparation:**
- Aliquot specimen and transport to CB ambient. Order Mayo test code CYSTC

**Units:**
- mg/L

**Reference Interval:**

**Males:**
- 0 days-22 years: no reference values established
- 23-29 years: 0.60-1.03 mg/L
- 30-39 years: 0.64-1.12 mg/L
- 40-49 years: 0.68-1.22 mg/L
- 50-59 years: 0.72-1.32 mg/L
- 60-69 years: 0.77-1.42 mg/L
- 70-79 years: 0.82-1.52 mg/L
- >79 years: no reference values established

**Females:**
- 0 days-22 years: no reference values established
- 23-29 years: 0.57-0.90 mg/L
- 30-39 years: 0.59-0.98 mg/L
- 40-49 years: 0.62-1.07 mg/L
- 50-59 years: 0.64-1.17 mg/L
- 60-69 years: 0.66-1.26 mg/L
- 70-80 years: 0.68-1.36 mg/L
- 81-86 years: 0.70-1.45 mg/L
- >86 years: no reference values established

**eGFR >60 mL/min/BSA**
- eGFR will not be calculated for patients under 18 years.

**Stability (from collection to initiation):**
- 7 days (any temperature)

**Reported:**
- 3-5 days

**Additional Information:**
- An index of glomerular filtration rate, especially in patients where serum creatinine may be misleading (eg, very obese, elderly, or malnourished patients)
- Assessing renal function in patients suspected of having kidney disease
- Monitoring treatment response in patients with kidney disease

**CPT Codes:**
- 82610-90

**LOINC Codes:**
- 33863-2
Cystic Fibrosis CBAVD Poly T Mutation
POLT

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run 1x per week, Monday-Friday, day shift only
Methodology: PCR and allele-specific probes
Reported: 7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
This test detects the 5T variant at the CFTR exon 9 splice site, which has been implicated in congenital bilateral absence of the vas deferens. The mutation can also affect the phenotype of some mild CF mutations.
If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- PCR
- CF Poly T

COLLECTION

Sample Type: EDTA whole blood, Tissue culture CVS
Collect: Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable
Amount to Collect: 3 mL blood
Preferred Volume: 3 mL blood
Minimum Volume: 0.5 mL blood
Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code: POLT
Test Group: Cystic Fibrosis
Performing Lab:
Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
3 mL blood

Minimum Volume:
0.5 mL blood

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

RESULT INTERPRETATION

Reference Interval:
5T allele not detected

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test detects the 5T variant at the CFTR exon 9 splice site, which has been implicated in congenital bilateral absence of the vas deferens. The mutation can also affect the phenotype of some mild CF mutations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
81224

LDT or Modified FDA:
Yes

LOINC Codes:
21654-9

COMPLETE VIEW

Available Stat:
No

Test Code:
POLT

Test Group:
Cystic Fibrosis

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week, Monday-Friday, day shift only

Methodology:
PCR and allele-specific probes

Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood
Sample Type:
EDTA whole blood, Tissue culture CVS

Preferred Volume:
3 mL blood

Minimum Volume:
0.5 mL blood

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval:
5T allele not detected

Synonyms:
- PCR
- CF Poly T

Reported:
7-10 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test detects the 5T variant at the CFTR exon 9 splice site, which has been implicated in congenital bilateral absence of the vas deferens. The mutation can also affect the phenotype of some mild CF mutations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
81224

LDT or Modified FDA:
Yes

LOINC Codes:
21654-9
Cystic Fibrosis, common mutations
MCFM

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 2x per week, Monday - Friday day shift only
Methodology:
Multiplex PCR, RDB
Reported:
7-10 days
Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A total of 34 mutations and the F508C polymorphism are included in this assay, which detects CF mutations in 88% of Caucasians, 94% of Ashkenazi Jewish decent, 72% of Hispanics and 65% of African Americans.

The UCSF CF panel encompasses all the ACMG recommended 23 mutations and 11 additional ones. Compared to the California CF newborn screen, the UCSF panel overlaps with 15 ACMG mutations and 2 common Hispanic mutations. A newborn who is suspected of having CF and tests negative or heterozygous by the State program might benefit from additional mutations screened for at UCSF.

Click here for comparison of UCSF, California State panels and ACMG recommended mutations

A reflex test for the 5/7/9T polymorphism is recommended to evaluate the association of CBAVD with CF, if the patient is diagnosed with the R117H mutation.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Reflex Testing:
5/7/9T Polymorphism test is performed if sample shows R117H mutation

Synonyms:
- CF mutations
- CF polymorphisms
- F508 deletion
- Delta F508 deletion
- Phenylalanine 508 deletion
- R553X mutation

COLLECTION

Sample Type:
Whole blood, Tissue culture, Amniotic fluid, Chorionic villi
Collect:
- Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable
Amount to Collect:
- See Preferred Volume
Preferred Volume:
Whole blood: 3 mL
Cell culture: 2 T25 flasks, 80% confluent
Amniotic fluid: 10 mL
Chorionic villi: 10 mg (2-3 mm diameter)

**Minimum Volume:**

- 0.5 mL for whole blood

**Remarks:**

- If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Stability (from collection to initiation):**

- Whole blood is stable refrigerated for 1 week.

**Unacceptable Conditions:**

- Insufficient sample provided. Samples collected in outdated blue top vacutainer.

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### PROCESSING

**Test Code:**
- MCFM

**Test Group:**
- Cystic Fibrosis

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**

- Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Preferred Volume:**

- Whole blood: 3 mL
- Cell culture: 2 T25 flasks, 80% confluent
- Amniotic fluid: 10 mL
- Chorionic villi: 10 mg (2-3 mm diameter)

**Minimum Volume:**

- 0.5 mL for whole blood

**Unacceptable Conditions:**

- Insufficient sample provided. Samples collected in outdated blue top vacutainer.

**Stability (from collection to initiation):**

- Whole blood is stable refrigerated for 1 week.

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### RESULT INTERPRETATION

**Reference Interval:**

- No mutation detected

**Additional Information:**

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A total of 34 mutations and the F508C polymorphism are included in this assay, which detects CF mutations in 88% of Caucasians, 94% of Ashkenazi Jewish decent, 72% of Hispanics and 65% of African Americans.

The UCSF CF panel encompasses all the ACMG recommended 23 mutations and 11 additional ones. Compared to the California CF newborn screen, the UCSF panel overlaps with 15 ACMG mutations and 2 common Hispanic mutations. A newborn who is suspected of having CF and tests negative or heterozygous by the State program might benefit from additional mutations screened for at UCSF.

[Click here for comparison of UCSF, California State panels and ACMG recommended mutations](#)

A reflex test for the 5/7/9T polymorphism is recommended to evaluate the association of CBAVD with CF, if the patient is diagnosed with the R117H mutation.

If a mutation is detected it is recommended that the patient seek genetic counseling.
Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**ADMINISTRATIVE**

CPT Codes:
- 81220

LDT or Modified FDA:
- Yes

LOINC Codes:
- 21654-9

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- MCFM

Test Group:
- Cystic Fibrosis

Performing Lab:
- Medical Genomics - Molecular Diagnostics

Performed:
- Run 2x per week, Monday - Friday day shift only

Methodology:
- Multiplex PCR, RDB

Remarks:
- If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
- Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:
- See Preferred Volume

Sample Type:
- Whole blood, Tissue culture, Amniotic fluid, Chorionic villi

Preferred Volume:
- Whole blood: 3 mL
- Cell culture: 2 T25 flasks, 80% confluent
- Amniotic fluid: 10 mL
- Chorionic villi: 10 mg (2-3 mm diameter)

Minimum Volume:
- 0.5 mL for whole blood

Unacceptable Conditions:
- Insufficient sample provided. Samples collected in outdated blue top vacutainer.

Specimen Preparation:
- Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval:
- No mutation detected

Synonyms:
- CF mutations
- CF polymorphisms
- F508 deletion
- Delta F508 deletion
- Phenylalanine 508 deletion
- R553X mutation

**Stability (from collection to initiation):**
Whole blood is stable refrigerated for 1 week.

**Reported:**
7-10 days

**Reflex Testing:**
5/7/9T Polymorphism test is performed if sample shows R117H mutation

**Additional Information:**

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A total of 34 mutations and the F508C polymorphism are included in this assay, which detects CF mutations in 88% of Caucasians, 94% of Ashkenazi Jewish decent, 72% of Hispanics and 65% of African Americans.

The UCSF CF panel encompasses all the ACMG recommended 23 mutations and 11 additional ones. Compared to the California CF newborn screen, the UCSF panel overlaps with 15 ACMG mutations and 2 common Hispanic mutations. A newborn who is suspected of having CF and tests negative or heterozygous by the State program might benefit from additional mutations screened for at UCSF.

[Click here for comparison of UCSF, California State panels and ACMG recommended mutations]

A reflex test for the 5/7/9T polymorphism is recommended to evaluate the association of CBAVD with CF, if the patient is diagnosed with the R117H mutation.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
81220

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
21654-9
Cysticercosis Antibody
TSABS

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
ELISA
Reported:
Performed 2x per week. Turnaround 5-10 days.
Additional Information:
Testing for IgM antibodies to T. solium is not available. If confirmation is desired, order Cysticercosis IgG AB Western Blot, Quest test #34279X
Synonyms:
- Cystercercosis
- Taenia solium
- Cysticercus cellulosae

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.1 mL serum
Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20°C 1 month.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
TSABS
Test Group:
Cysticercosis
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Order Quest test # 96008P
Preferred Volume:
1 mL serum
Minimum Volume:
0.1 mL serum

Unacceptable Conditions:
- Collected in Gold top

Stability (from collection to initiation):
- Room temperature 7 days, refrigerated 2 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
- Index

Reference Interval:
- <0.90

Additional Information:
- Testing for IgM antibodies to T. solium is not available. If confirmation is desired, order Cysticercosis IgG AB Western Blot, Quest test #34279X

ADMINISTRATIVE

CPT Codes:
- 86682-90

LOINC Codes:
- 7847-7

COMPLETE VIEW

Available Stat:
- No

Test Code:
- TSABS

Test Group:
- Cysticercosis

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- ELISA

Collect:
- Red top (Gold top NOT acceptable)

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.1 mL serum

Unacceptable Conditions:
- Collected in Gold top

Specimen Preparation:
- Order Quest test #96008P

Units:
- Index

Reference Interval:
- <0.90
Synonyms:

- Cystercercosis
- Taenia solium
- Cysticercus cellulosae

Stability (from collection to initiation):

Room temperature 7 days, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:

Performed 2x per week. Turnaround 5-10 days.

Additional Information:

Testing for IgM antibodies to T. solium is not available. If confirmation is desired, order Cysticercosis IgG AB Western Blot, Quest test #34279X

CPT Codes:

86682-90

LOINC Codes:

7847-7
Cysticercosis Antibody (IgG), Western Blot
TSASB

ORDERING

Performing Lab: Quest
Methodology: Western Blot
Reported: 3-5 days
Additional Information: This assay is a qualitative test for the confirmation of specific IgG antibodies recognizing Taenia Solium, the agent causing Cysticercosis. Detection of antibodies to any 6 specific T.solium glycoprotein bands of molecular weight 50, 42-39, 24, 21, 18, and 14 kilodaltons is interpreted as a positive result. However, a positive result without reactivity to the 50 and 42-39 glycoprotein bands may reflect crossreactive antibodies induced by Echinococcus.

COLLECTION

Sample Type: Serum
Collect: Gold top (SST)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
  Room temperature: 7 days
  Refrigerated: 14 days
  Frozen: 30 days

PROCESSING

Test Code: TSASB
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze serum. Transport to CB frozen, Order Quest test code 34279.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
  Room temperature: 7 days
  Refrigerated: 14 days
  Frozen: 30 days

RESULT INTERPRETATION
Additional Information:
This assay is a qualitative test for the confirmation of specific IgG antibodies recognizing Taenia Solium, the agent causing Cysticerosis. Detection of antibodies to any 6 specific T.solium glycoprotein bands of molecular weight 50, 42-39, 24, 21, 18, and 14 kilodaltons is interpreted as a positive result. However, a positive result without reactivity to the 50 and 42-39 glycoprotein bands may reflect crossreactive antibodies induced by Echinococcus.

ADMINISTRATIVE

CPT Codes:
86682

LOINC Codes:
6374-3

COMPLETE VIEW

Test Code:
TSASB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Western Blot

Collect:
Gold top (SST)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Aliquot and freeze serum. Transport to CB frozen, Order Quest test code 34279.

Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: 14 days
Frozen: 30 days

Reported:
3-5 days

Additional Information:
This assay is a qualitative test for the confirmation of specific IgG antibodies recognizing Taenia Solium, the agent causing Cysticerosis. Detection of antibodies to any 6 specific T.solium glycoprotein bands of molecular weight 50, 42-39, 24, 21, 18, and 14 kilodaltons is interpreted as a positive result. However, a positive result without reactivity to the 50 and 42-39 glycoprotein bands may reflect crossreactive antibodies induced by Echinococcus.

CPT Codes:
86682

LOINC Codes:
6374-3
Cysticercosis Antibody, CSF (IgG)
TSCSF

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Western blot
Reported:
Performed once per week. Turnaround 5-15 days
Additional Information:
Testing for IgM antibodies to T. solium is not available.
Synonyms:
- Cystercercosis
- Taenia solium
- Cysticercus cellulosae

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
1 mL CSF
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF
Stability (from collection to initiation):
Frozen at -20C 1 year
Rejection Criteria:
Sample received thawed.

PROCESSING

Test Code:
TSCSF
Test Group:
Cysticercosis
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Freeze CSF at -20C, ship frozen. Order Quest Test #34164X
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF
Rejection Criteria:  
  Sample received thawed.

Stability (from collection to initiation):  
  Frozen at -20°C 1 year

RESULT INTERPRETATION

Reference Interval:  
  Negative

Additional Information:  
  Testing for IgM antibodies to T. solium is not available.

ADMINISTRATIVE

CPT Codes:  
  86682-90

LOINC Codes:  
  7846-9

COMPLETE VIEW

Available Stat:  
  No

Test Code:  
  TSCSF

Test Group:  
  Cysticercosis

Performing Lab:  
  Focus via Quest

Sendout:  
  Yes

Methodology:  
  Western blot

Collect:  
  CSF tube or sterile collection tube

Amount to Collect:  
  1 mL CSF

Sample Type:  
  CSF

Preferred Volume:  
  1 mL CSF

Minimum Volume:  
  0.1 mL CSF

Rejection Criteria:  
  Sample received thawed.

Specimen Preparation:  
  Freeze CSF at -20°C, ship frozen. Order Quest Test #34164X

Reference Interval:  
  Negative

Synonyms:  
  - Cystercercosis
  - Taenia solium
  - Cysticercus cellulosae

Stability (from collection to initiation):
Frozen at -20°C 1 year

Reported:
- Performed once per week. Turnaround 5-15 days

Additional Information:
- Testing for IgM antibodies to T. solium is not available.

CPT Codes:
- 86682-90

LOINC Codes:
- 7846-9
Cystine, Quantitative, 24 hour urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS
Reported:
Set up 2x per week. Turnaround 5-10 days

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output.
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Remarks:
Keep collection container refrigerated during 24 hr. collection. Take collection to the laboratory as soon as possible on the second day for processing by the laboratory. Note: patient should not have IVP in the 48 hours preceding the start of the collection or during the collection.
Stability (from collection to initiation):
Frozen 2 months.
Unacceptable Conditions:
Sample received unrefrigerated.
Rejection Criteria:
pH < 2.0 upon receipt. Sample received unfrozen.

PROCESSING

Test Code:
CUQNT
Test Group:
Cystine
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Process sample immediately upon receipt. Record total volume in mL (based on weight in grams), mix well, prepare aliquot and freeze at -20C.
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Unacceptable Conditions:
- Sample received unrefrigerated.

Rejection Criteria:
- pH < 2.0 upon receipt. Sample received unfrozen.

Stability (from collection to initiation):
- Frozen 2 months.

RESULT INTERPRETATION

Units:
- µmol/24 hours

Reference Interval:
- 0-9 years: 6-48 µmol/24 hours
- 10-13 years: 10-94 µmol/24 hours
- 14-17 years: 17-102 µmol/24 hours
- > 17 years: 24-184 µmol/24 hours

ADMINISTRATIVE

CPT Codes:
- 82131-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- CUQNT

Test Group:
- Cystine

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- LC/MS

Remarks:
- Keep collection container refrigerated during 24 hr. collection. Take collection to the laboratory as soon as possible on the second day for processing by the laboratory. Note: patient should not have IVP in the 48 hours preceding the start of the collection or during the collection.

Collect:
- 24 hour urine collection container

Amount to Collect:
- Entire 24 hour urine output.

Sample Type:
- 24 hour urine collection

Preferred Volume:
- 10 mL urine

Minimum Volume:
- 2 mL urine

Rejection Criteria:
- pH < 2.0 upon receipt. Sample received unfrozen.

Unacceptable Conditions:
- Sample received unrefrigerated.

Specimen Preparation:
Process sample immediately upon receipt. Record total volume in mL (based on weight in grams), mix well, prepare aliquot and freeze at -20C.

**Units:**

µmol/24 hours

**Reference Interval:**

- 0-9 years: 6-48 µmol/24 hours
- 10-13 years: 10-94 µmol/24 hours
- 14-17 years: 17-102 µmol/24 hours
- > 17 years: 24-184 µmol/24 hours

**Stability (from collection to initiation):**

Frozen 2 months.

**Reported:**

Set up 2x per week. Turnaround 5-10 days

**CPT Codes:**

82131-90
Cystine, Quantitative, random urine
CUQT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Test run as needed, at least 3x weekly. Turnaround 3-5 days
Additional Information:
Clinical Significance: Cystinuria is an autosomal recessive disease in which dibasic amino acids, including cystine, are excreted in excess. Also part of Amino Acid Analysis. Pediatric reference ranges are from Soldin SJ et al., eds., Pediatric Reference Ranges, 2nd ed., AACC Press, 1997, pp. 20-29.

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
2 mL urine
Minimum Volume:
1.8 mL urine

PROCESSING

Test Code:
CUQT
Test Group:
Cystine
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze sample at -20C. Order Quest # 9605N.
Preferred Volume:
2 mL urine
Minimum Volume:
1.8 mL urine

RESULT INTERPRETATION

Units:
mmol/mol creatinine
Reference Interval:
Cystine
Pediatric (<18 Years): 2.8-10.9 mmol/mol creat
Adult: 2.9-14.1 mmol/mol creat

**Creatinine Random Urine**
<=6 Months: 0.18-2.86 mmol/L
7-11 Months: 0.18-3.19 mmol/L
1-2 Years: 0.18-11.33 mmol/L
3-8 Years: 0.18-13.19 mmol/L
9-12 Years: 0.18-16.19 mmol/L
Adult: 2.38-26.55 mmol/L

**Additional Information:**
Clinical Significance: Cystinuria is an autosomal recessive disease in which dibasic amino acids, including cystine, are excreted in excess. Also part of Amino Acid Analysis. Pediatric reference ranges are from Soldin SJ et al., eds., Pediatric Reference Ranges, 2nd ed., AACC Press, 1997, pp. 20-29.

**ADMINISTRATIVE**

**CPT Codes:**
82131-90

**LOINC Codes:**
22687-8

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
CUQT

**Test Group:**
Cystine

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
LC/MS/MS

**Collect:**
Urine cup

**Amount to Collect:**
See preferred volume

**Sample Type:**
Random urine

**Preferred Volume:**
2 mL urine

**Minimum Volume:**
1.8 mL urine

**Specimen Preparation:**
Freeze sample at -20C. Order Quest # 9605N.

**Units:**
mmol/mol creatinine

**Reference Interval:**
Cystine
Pediatric (<18 Years): 2.8-10.9 mmol/mol creat
Adult: 2.9-14.1 mmol/mol creat

Creatinine Random Urine
<=6 Months: 0.18-2.86 mmol/L
7-11 Months: 0.18-3.19 mmol/L  
1-2 Years: 0.18-11.33 mmol/L  
3-8 Years: 0.18-13.19 mmol/L  
9-12 Years: 0.18-16.19 mmol/L  
Adult: 2.38-26.55 mmol/L

**Reported:**
Test run as needed, at least 3x weekly. Turnaround 3-5 days

**Additional Information:**
Clinical Significance: Cystinuria is an autosomal recessive disease in which dibasic amino acids, including cystine, are excreted in excess. Also part of Amino Acid Analysis. Pediatric reference ranges are from Soldin SJ et al., eds., Pediatric Reference Ranges, 2nd ed., AACC Press, 1997, pp. 20-29.

**CPT Codes:**
82131-90

**LOINC Codes:**
22687-8
Cytomegalovirus antibody, IgG
CMVAB

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:
This assay measures IgG anti-CMV antibodies and is a useful test for evaluation of prior CMV exposure.
If the assay is positive and there is a clinical need to determine if there is an acute infection, assays for CMV IgM antibodies and/or PCR for the CMV virus could be ordered as sendout tests.
A single positive sample provides evidence of prior infection.
This test is NOT FDA approved for screening of blood, tissue, or organ donors.
Note: Sera are not retained for comparative testing with a later sample.
Synonyms:
• CMV Antibody
• CMV Ab
• CMV serology
• TORCH antibodies
• CMV inclusion disease
• CMV Antibody total

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 3 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

PROCESSING

Test Code: CMVAB
Test Group: Cytomegalovirus
Performing Lab:
Immunology

Specimen Preparation:

If CMV Antibody (Total) is ordered, order CMVAB (CMV Ab, IgG) instead. If CMV Antibody IgM is specifically requested, order CMVIGM. If both Total and IgM are requested, order both CMVAB and CMVIGM.

Preferred Volume:

1 mL serum

Minimum Volume:

0.5 mL serum

RESULT INTERPRETATION

Reference Interval:

Negative

Additional Information:

This assay measures IgG anti-CMV antibodies and is a useful test for evaluation of prior CMV exposure.

If the assay is positive and there is a clinical need to determine if there is an acute infection, assays for CMV IgM antibodies and/or PCR for the CMV virus could be ordered as sendout tests.

A single positive sample provides evidence of prior infection.

This test is NOT FDA approved for screening of blood, tissue, or organ donors.

Note: Sera are not retained for comparative testing with a later sample.

ADMINISTRATIVE

CPT Codes:

86644

LOINC Codes:

13949-3

COMPLETE VIEW

Available Stat:

No

Test Code:

CMVAB

Test Group:

Cytomegalovirus

Performing Lab:

Immunology

Performed:

Monday-Friday (day shift)

Methodology:

Chemiluminescent Immunoassay

Collect:

Gold top

Amount to Collect:

3 mL blood

Sample Type:

Serum

Preferred Volume:

1 mL serum

Minimum Volume:

0.5 mL serum
Specimen Preparation:
If CMV Antibody (Total) is ordered, order CMVAB (CMV Ab, IgG) instead. If CMV Antibody IgM is specifically requested, order CMVIGM. If both Total and IgM are requested, order both CMVAB and CMVIGM.

Reference Interval:
Negative

Synonyms:
- CMV Antibody
- CMV Ab
- CMV serology
- TORCH antibodies
- CMV inclusion disease
- CMV Antibody total

Reported:
1-4 days

Additional Information:
This assay measures IgG anti-CMV antibodies and is a useful test for evaluation of prior CMV exposure.

If the assay is positive and there is a clinical need to determine if there is an acute infection, assays for CMV IgM antibodies and/or PCR for the CMV virus could be ordered as sendout tests.

A single positive sample provides evidence of prior infection.

This test is NOT FDA approved for screening of blood, tissue, or organ donors.

Note: Sera are not retained for comparative testing with a later sample.

CPT Codes:
86644

LOINC Codes:
13949-3
Cytomegalovirus Antibody, IgM
CMVIGM

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:
Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. If an acute infection is suspected, consider obtaining a new specimen and submit for both IgG and IgM testing in two or more weeks. Latency and reactivation of CMV influence the interpretation of serological results. The presence of CMV IgM suggests a recent CMV exposure but does not differentiate between primary infection and reactivation.

Synonyms:
- CMV
- CID
- CMV IgM
- TORCH Antibodies
- CMV inclusion disease

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 ml serum

PROCESSING

Test Code: CMVIGM
Test Group: Cytomegalovirus
Performing Lab: Immunology
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 ml serum
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. If an acute infection is suspected, consider obtaining a new specimen and submit for both IgG and IgM testing in two or more weeks. Latency and reactivation of CMV influence the interpretation of serological results. The presence of CMV IgM suggests a recent CMV exposure but does not differentiate between primary infection and reactivation.

ADMINISTRATIVE

CPT Codes:
86645

LOINC Codes:
24119-0

COMPLETE VIEW

Available Stat:
No

Test Code:
CMVIGM

Test Group:
Cytomegalovirus

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Reference Interval:
Negative

Synonyms:
- CMV
- CID
- CMV IgM
- TORCH Antibodies
- CMV inclusion disease

Reported:
1-4 days

Additional Information:
Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. If an acute infection is suspected, consider obtaining a new specimen and submit for both IgG and IgM testing in two or more weeks. Latency and reactivation of CMV influence the interpretation of serological results. The presence of CMV IgM suggests a recent CMV exposure but does not differentiate between primary infection and reactivation.
of CMV influence the interpretation of serological results. The presence of CMV IgM suggests a recent CMV exposure but does not differentiate between primary infection and reactivation.

CPT Codes:
- 86645

LOINC Codes:
- 24119-0
Cytomegalovirus culture
P320

ORDERING

Ordering Recommendations:

Urine culture for CMV is only appropriate for newborns up to 3 weeks to attempt to document congenital infection as opposed to infection acquired during delivery which becomes urine positive after 3-4 weeks postpartum.

Approval Required:
Yes, for testing on urine samples on patients > 3 weeks old. Contact the Microbiology Lab at 353-1268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily.

Methodology:
Shell vial culture

Reported:
1-2 days

Additional Information:
Urine is acceptable only on infants up to 3 weeks old.

Note: Order PCR on amniotic fluid, pericardial fluid, vitreous fluid, CSF, and blood as PCR is more sensitive.

Order Cytomegalovirus Genotyping on blood if susceptibility testing is indicated

Synonyms:
- Viral culture
- CMV
- CID
- CMV inclusion disease

COLLECTION

Sample Type:
BAL, bronchial brush, unfixed tissue biopsy, random urine

Note: Order PCR on amniotic fluid, pericardial fluid, vitreous fluid, CSF, and blood as PCR is more sensitive. Order Cytomegalovirus Genotyping on blood if susceptibility testing is indicated

Collect:
Urine cup, sterile container

Amount to Collect:
See preferred volumes

Preferred Volume:
- BAL: 10-20 mL
- Tissue biopsy: 2 cubic mm
- Urine: 10-20 mL
- Body fluid: 5-10 mL

Minimum Volume:
- Tissue biopsy: 2 cubic mm
- BAL, Urine, Body Fluid: 0.5 mL

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 2 days.
Unacceptable Conditions:

Unsuitable sample types

PROCESSING

Test Code:
P320
Test Group:
CMV
Performing Lab:
Microbiology
Preferred Volume:
- BAL: 10-20 mL
- Tissue biopsy: 2 cubic mm
- Urine: 10-20 mL
- Body fluid: 5-10 mL
Minimum Volume:
- Tissue biopsy: 2 cubic mm
- BAL, Urine, Body Fluid: 0.5 mL

Unacceptable Conditions:

Unsuitable sample types

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 2 days.

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Urine is acceptable only on infants up to 3 weeks old.

Note: Order PCR on amniotic fluid, pericardial fluid, vitreous fluid, CSF, and blood as PCR is more sensitive.

Order Cytomegalovirus Genotyping on blood if susceptibility testing is indicated

ADMINISTRATIVE

CPT Codes:
87254
LOINC Codes:
43701-2

COMPLETE VIEW

Approval Required:
Yes, for testing on urine samples on patients > 3 weeks old. Contact the Microbiology Lab at 353-1268
Available Stat:
No
Ordering Recommendations:

Urine culture for CMV is only appropriate for newborns up to 3 weeks to attempt to document congenital infection as opposed to infection acquired during delivery which becomes urine positive after 3-4 weeks postpartum.

Test Code:
P320
Test Group:
CMV

Performing Lab: Microbiology

Performed: Set up daily.

Methodology: Shell vial culture

Collect: Urine cup, sterile container

Amount to Collect: See preferred volumes

Sample Type: BAL, bronchial brush, unfixed tissue biopsy, random urine

Note: Order PCR on amniotic fluid, pericardial fluid, vitreous fluid, CSF, and blood as PCR is more sensitive. Order Cytomegalovirus Genotyping on blood if susceptibility testing is indicated

Preferred Volume:
- BAL: 10-20 mL
- Tissue biopsy: 2 cubic mm
- Urine: 10-20 mL
- Body fluid: 5-10 mL

Minimum Volume:
- Tissue biopsy: 2 cubic mm
- BAL, Urine, Body Fluid: 0.5 mL

Unacceptable Conditions: Unsuitable sample types

Reference Interval: Negative

Synonyms:
- Viral culture
- CMV
- CID
- CMV inclusion disease

Stability (from collection to initiation):
- Room temperature 6 hours, refrigerated 2 days.

Reported: 1-2 days

Additional Information:
- Urine is acceptable only on infants up to 3 weeks old.

Note: Order PCR on amniotic fluid, pericardial fluid, vitreous fluid, CSF, and blood as PCR is more sensitive.

Order Cytomegalovirus Genotyping on blood if susceptibility testing is indicated

CPT Codes: 87254

LOINC Codes: 43701-2
Cytomegalovirus DNA, Quantitative
CMVQT

ORDERING

Available Stat:
No, however, if the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Performing Lab:
Microbiology

Performed:
Test performed Monday - Friday day shift only

Methodology:
Quantitative Real time PCR

Reported:
Turnaround time 1-4 days

Additional Information:
This assay uses real-time PCR methodology to amplify a segment of the DNA polymerase (UL54) gene, and is capable of accurate quantification from 137 IU/mL to 9.10 x 10e8 IU/mL. Samples with DNA detected below the linear range will be reported as "Detected, < 137 IU/mL". Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect CMV DNA down to a lower limit of approximately 91 IU/mL.

This assay is most useful in monitoring patients at risk for development of CMV disease with end-organ manifestations (pneumonia, colitis, esophagitis, nephritis, chorioretinitis, encephalitis, polyradiculopathy, adrenalitis, hepatitis) or dissemination. Immunocompromised patients, including solid organ and hematopoietic stem cell transplant recipients and AIDS patients are at higher risk for clinical disease.

Changes in CMV viremia often parallel or precede end-organ clinical manifestations and can also be used to monitor treatment efficacy. Because different test methods can yield varying results, we recommend utilizing the same laboratory methodology to compare values.

Synonyms:
- CMV
- PCR
- CID
- CMV inclusion disease

COLLECTION

Sample Type:
EDTA Plasma

Collect:
Lavender top

Amount to Collect:
3 mL blood

Preferred Volume:
1.5 mL plasma

Minimum Volume:
1 mL plasma IMPORTANT: for samples between 0.5 and 1.0 mL forward sample to Microbiology for them to determine if it can be tested.

Remarks:
Do not draw from heparin containing lines.

Note: If the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Stability (from collection to initiation):
Room temperature 6 hours for whole blood, frozen at -70C indefinite.
Unacceptable Conditions:

- Heparinized, grossly hemolyzed samples or repeat sample from a patient within 5 days.

PROCESSING

Test Code: CMVQT
Test Group: CMV
Performing Lab: Microbiology
Specimen Preparation:
- Separate plasma from cells and freeze at -70°C within 6 hours of collection.
Preferred Volume:
- 1.5 mL plasma
Minimum Volume:
- 1 mL plasma

IMPORTANT: for samples between 0.5 and 1.0 mL forward sample to Microbiology for them to determine if it can be tested.

Unacceptable Conditions:
- Heparinized, grossly hemolyzed samples or repeat sample from a patient within 5 days.

Stability (from collection to initiation):
- Room temperature 6 hours for whole blood, frozen at -70°C indefinite.

RESULT INTERPRETATION

Units:
- IU/mL
Reference Interval:
- Not detected
Additional Information:
- This assay uses real-time PCR methodology to amplify a segment of the DNA polymerase (UL54) gene, and is capable of accurate quantification from 137 IU/mL to 9.10 x 10^8 IU/mL. Samples with DNA detected below the linear range will be reported as "Detected, < 137 IU/mL". Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.
- The assay can reliably detect CMV DNA down to a lower limit of approximately 91 IU/mL.
- This assay is most useful in monitoring patients at risk for development of CMV disease with end-organ manifestations (pneumonia, colitis, esophagitis, nephritis, chorioretinitis, encephalitis, polyradiculopathy, adrenalitis, hepatitis) or dissemination.
- Immunocompromised patients, including solid organ and hematopoietic stem cell transplant recipients and AIDS patients are at higher risk for clinical disease.
- Changes in CMV viremia often parallel or precede end-organ clinical manifestations and can also be used to monitor treatment efficacy. Because different test methods can yield varying results, we recommend utilizing the same laboratory methodology to compare values.

ADMINISTRATIVE

CPT Codes:
- 87497
LOINC Codes:
- 33006-8

COMPLETE VIEW

Available Stat:
- No, however, if the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Test Code:
CMVQT

Test Group:
CMV

Performing Lab:
Microbiology

Performed:
Test performed Monday - Friday day shift only

Methodology:
Quantitative Real time PCR

Remarks:
Do not draw from heparin containing lines.

Note: If the patient needs the result rapidly, contact the Virology lab at 415-353-4730 to make sure the sample is included in the next available run.

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
1.5 mL plasma

Minimum Volume:
1 mL plasma IMPORTANT: for samples between 0.5 and 1.0 mL forward sample to Microbiology for them to determine if it can be tested.

Unacceptable Conditions:
Heparinized, grossly hemolyzed samples or repeat sample from a patient within 5 days.

Specimen Preparation:
Separate plasma from cells and freeze at -70°C within 6 hours of collection.

Units:
IU/mL

Reference Interval:
Not detected

Synonyms:
- CMV
- PCR
- CID
- CMV inclusion disease

Stability (from collection to initiation):
Room temperature 6 hours for whole blood, frozen at -70°C indefinite.

Reported:
Turnaround time 1-4 days

Additional Information:
This assay uses real-time PCR methodology to amplify a segment of the DNA polymerase (UL54) gene, and is capable of accurate quantification from 137 IU/mL to 9.10 x 10^8 IU/mL. Samples with DNA detected below the linear range will be reported as "Detected, < 137 IU/mL". Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number.

The assay can reliably detect CMV DNA down to a lower limit of approximately 91 IU/mL.

This assay is most useful in monitoring patients at risk for development of CMV disease with end-organ manifestations (pneumonia, colitis, esophagitis, nephritis, chorioretinitis, encephalitis, polyradiculopathy, adrenalitis, hepatitis) or dissemination. Immunocompromised patients, including solid organ and hematopoietic stem cell transplant recipients and AIDS patients are at higher risk for clinical disease.

Changes in CMV viremia often parallel or precede end-organ clinical manifestations and can also be used to monitor treatment efficacy. Because different test methods can yield varying results, we recommend utilizing the same laboratory methodology to compare values.

CPT Codes:
87497
LOINC Codes:
33006-8
Cytomegalovirus DNA, Quantitative, Non-plasma samples
CMVMIS

ORDERING

Approval Required:
None required for CSF, amniotic fluid and urine testing. Requests for testing on all other non-blood samples require approval, contact Microbiology @ x31268. (see Additional Information)

Available Stat:
No

Performing Lab:
Viracor

Methodology:
Quantitative Real-time PCR

Reported:
Test run Monday-Saturday, results available 24 hours after receipt by ViraCor.

Additional Information:
Clinical Significance: CMV infections are common and usually asymptomatic. In patients who are immunocompromised, CMV may cause disseminated, severe disease. CMV may cause birth defects in a minority of infected newborns. DNA methods provide the highest sensitivity and specificity of any method.

For detection of CMV in congenital infection, qualitative CMV culture of urine has adequate sensitivity and better specificity than PCR, which can be too sensitive and pick up very low levels of virus. While CMV PCR on urine from immunocompromised patients has a fairly low specificity for disease, there is some literature describing utility of quantitative CMV PCR on urine for following renal transplant patients.

Synonyms:
- CMV
- PCR
- CID
- CMV inclusion disease

COLLECTION

Sample Type:
CSF, Bone marrow, Unfixed tissue, BAL, Amniotic fluid, Urine

Collect:
CSF tube or sterile collection tube, EDTA Tube, Urine cup

Amount to Collect:
3 mL CSF or fluid

Preferred Volume:
3 mL CSF or fluid

Minimum Volume:
2 mL CSF or fluid

PROCESSING

Test Code:
CMVMIS

Test Group:
CMV

Sendout:
Yes

Performing Lab:
Viracor
Specimen Preparation:
Freeze samples and ship frozen to China Basin. Ship on dry ice to Viracor.

Preferred Volume:
3 mL CSF or fluid

Minimum Volume:
2 mL CSF or fluid

RESULT INTERPRETATION

Units:
IU/mL

Reference Interval:
Not detected

Additional Information:
Clinical Significance: CMV infections are common and usually asymptomatic. In patients who are immunocompromised, CMV may cause disseminated, severe disease. CMV may cause birth defects in a minority of infected newborns. DNA methods provide the highest sensitivity and specificity of any method.

For detection of CMV in congenital infection, qualitative CMV culture of urine has adequate sensitivity and better specificity than PCR, which can be too sensitive and pick up very low levels of virus. While CMV PCR on urine from immunocompromised patients has a fairly low specificity for disease, there is some literature describing utility of quantitative CMV PCR on urine for following renal transplant patients.

ADMINISTRATIVE

CPT Codes:
87497-90

LOINC Codes:
33006-8

COMPLETE VIEW

Approval Required:
None required for CSF, amniotic fluid and urine testing. Requests for testing on all other non-blood samples require approval, contact Microbiology @ x31268. (see Additional Information)

Available Stat:
No

Test Code:
CMVMIS

Test Group:
CMV

Performing Lab:
Viracor

Sendout:
Yes

Methodology:
Quantitative Real-time PCR

Collect:
CSF tube or sterile collection tube, EDTA Tube, Urine cup

Amount to Collect:
3 mL CSF or fluid

Sample Type:
CSF, Bone marrow, Unfixed tissue, BAL, Amniotic fluid, Urine

Preferred Volume:
3 mL CSF or fluid

Minimum Volume:
2 mL CSF or fluid

**Specimen Preparation:**
Freeze samples and ship frozen to China Basin. Ship on dry ice to Viracor.

**Units:**
IU/mL

**Reference Interval:**
Not detected

**Synonyms:**
- CMV
- PCR
- CID
- CMV inclusion disease

**Reported:**
Test run Monday-Saturday, results available 24 hours after receipt by ViraCor.

**Additional Information:**
Clinical Significance: CMV infections are common and usually asymptomatic. In patients who are immunocompromised, CMV may cause disseminated, severe disease. CMV may cause birth defects in a minority of infected newborns. DNA methods provide the highest sensitivity and specificity of any method.

For detection of CMV in congenital infection, qualitative CMV culture of urine has adequate sensitivity and better specificity than PCR, which can be too sensitive and pick up very low levels of virus. While CMV PCR on urine from immunocompromised patients has a fairly low specificity for disease, there is some literature describing utility of quantitative CMV PCR on urine for following renal transplant patients.

**CPT Codes:**
87497-90

**LOINC Codes:**
33006-8
Cytomegalovirus Genotyping
CMAVR

ORDERING

Ordering Recommendations:
This should only be ordered in patients who have rising plasma CMV viral loads after at least 3-4 weeks or more of antiviral therapy. CMV viral loads commonly rise during the first 2-3 weeks of therapy but this does not indicate resistance unless the patient has had recent exposure to the specific drug.

Available Stat:
No

Performing Lab:
Viracor

Methodology:
PCR, DNA sequencing

Reported:
Set up Monday - Friday. Turnaround 4-6 days

Additional Information:
Resistance of CMV to antivirals usually requires weeks to months of drug exposure and should not be ordered in the first few weeks of treatment, even if viral copy numbers appear to be rising.

Assaying CMV susceptibility to one or more antivirals phenotypically, by culture, can take several weeks and requires a viable viral isolate. Genotypic testing, i.e., determining whether the virus has one or more mutations associated with resistance, can be performed in a few days and directly on clinical specimens if sufficient viral copy numbers are present. Two genes, UL97 and UL54, the DNA polymerase, are sequenced to permit determination of resistance to ganciclovir, cidofovir and/or foscarnet.

If a mutation has been detected in either the UL97 or UL54 Gene Targets, the mutation site is indicated. A result of "None Detected" indicates that no mutations were detected for that gene target.


This test was developed and its performance characteristics determined by Viracor-IBT Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. Results should be used in conjunction with clinical findings, and should not form the sole basis for a diagnosis or treatment decision.

Synonyms:
- CMV
- CMV susceptibility
- CID
- CMV resistance
- CMV inclusion disease

COLLECTION

Sample Type:
EDTA plasma
Collect:
Lavender top

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL plasma

Minimum Volume:
1.5 mL plasma

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

Rejection Criteria:
CMV DNA concentrations too low to allow antiviral resistance testing (<1000 IU/mL for plasma)

PROCESSING

Test Code:
CMVAVR

Test Group:
CMV

Sendout:
Yes

Performing Lab:
Viracor

Specimen Preparation:
Separate plasma within 2 hours of collection and transfer to sterile screw-top plastic vial. Freeze plasma at -20°C and ship to China Basin and ViraCor on dry ice.

Order ViraCor test # 5600

Call ViraCor for authorization on anything other than plasma. Sequencing assays are very sensitive to inhibition, and processing of other sample types, including CSF and BAL, may be affected by PCR inhibitors that affect the result.

Preferred Volume:
2 mL plasma

Minimum Volume:
1.5 mL plasma

Rejection Criteria:
CMV DNA concentrations too low to allow antiviral resistance testing (<1000 IU/mL for plasma)

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

RESULT INTERPRETATION

Additional Information:
Resistance of CMV to antivirals usually requires weeks to months of drug exposure and should not be ordered in the first few weeks of treatment, even if viral copy numbers appear to be rising.

Assaying CMV susceptibility to one or more antivirals phenotypically, by culture, can take several weeks and requires a viable viral isolate. Genotypic testing, i.e., determining whether the virus has one or more mutations associated with resistance, can be performed in a few days and directly on clinical specimens if sufficient viral copy numbers are present. Two genes, UL97 and UL54, the DNA polymerase, are sequenced to permit determination of resistance to ganciclovir, cidofovir and/or foscarnet.

If a mutation has been detected in either the UL97 or UL54 Gene Targets, the mutation site is indicated. A result of "None Detected" indicates that no mutations were detected for that gene target.

UL97 mutations analyzed that have been confirmed by marker transfer experiments include L405P, M460V, M460I, M460T, V466G, C518Y, H520Q, 590-593DEL, 591-594DEL, 591-607DEL, C592G, A594E, A594G, A594V, A594T, A594P, 595-603DEL, L595F, L595S, L595W, 595DEL, E596G, G598S, K599T, 600DEL, 601-603DEL, C603R, C603W, C607F, C607Y, and A613V. Other mutations analyzed that have been found in resistant clinical isolates include M460L, A590T, 590-600DEL, 590-603DEL, A591D, C592F, 594-


This test was developed and its performance characteristics determined by Viracor-IBT Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. Results should be used in conjunction with clinical findings, and should not form the sole basis for a diagnosis or treatment decision.

**ADMINISTRATIVE**

**CPT Codes:**
83891 (x15) 83898 (x5) 83904 (x10) 83912 (x1) 83890 (x1) 83909 (x10)

**LOINC Codes:**
40444-2

**COMPLETE VIEW**

**Available Stat:**
No

**Ordering Recommendations:**
This should only be ordered in patients who have rising plasma CMV viral loads after at least 3-4 weeks or more of anti-viral therapy. CMV viral loads commonly rise during the first 2-3 weeks of therapy but this does not indicate resistance unless the patient has had recent exposure to the specific drug.

**Test Code:**
CMVAVR

**Test Group:**
CMV

**Performing Lab:**
Viracor

**Sendout:**
Yes

**Methodology:**
PCR, DNA sequencing

**Collect:**
Lavender top

**Amount to Collect:**
4 mL blood

**Sample Type:**
EDTA plasma

**Preferred Volume:**
2 mL plasma

**Minimum Volume:**
1.5 mL plasma

**Rejection Criteria:**
CMV DNA concentrations too low to allow antiviral resistance testing (<1000 IU/mL for plasma)

**Specimen Preparation:**
Separate plasma within 2 hours of collection and transfer to sterile screw-top plastic vial. Freeze plasma at -20C and ship to China Basin and ViraCor on dry ice.

Order ViraCor test # 5600

Call ViraCor for authorization on anything other than plasma. Sequencing assays are very sensitive to inhibition, and processing of other
sample types, including CSF and BAL, may be affected by PCR inhibitors that affect the result.

**Synonyms:**
- CMV
- CMV susceptibility
- CID
- CMV resistance
- CMV inclusion disease

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

**Reported:**
- Set up Monday - Friday. Turnaround 4-6 days

**Additional Information:**
- Resistance of CMV to antivirals usually requires weeks to months of drug exposure and should not be ordered in the first few weeks of treatment, even if viral copy numbers appear to be rising.

Assaying CMV susceptibility to one or more antivirals phenotypically, by culture, can take several weeks and requires a viable viral isolate. Genotypic testing, i.e., determining whether the virus has one or more mutations associated with resistance, can be performed in a few days and directly on clinical specimens if sufficient viral copy numbers are present. Two genes, UL97 and UL54, the DNA polymerase, are sequenced to permit determination of resistance to ganciclovir, cidofovir and/or foscarnet.

If a mutation has been detected in either the UL97 or UL54 Gene Targets, the mutation site is indicated. A result of "None Detected" indicates that no mutations were detected for that gene target.


This test was developed and its performance characteristics determined by Viracor-IBT Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. Results should be used in conjunction with clinical findings, and should not form the sole basis for a diagnosis or treatment decision.

**CPT Codes:**
- 83891 (x15) 83898 (x5) 83904 (x10) 83912 (x1) 83890 (x1) 83909 (x10)

**LOINC Codes:**
- 40444-2
Cytotoxicity Antibody Screen
ILCAS

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Cytotoxicity
Reported: Test run Monday - Friday. Expected TAT for routine test is < 21 working days.
Additional Information: This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Synonyms: • Quickscreen, PRA by Cytotoxicity

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 6 mL blood
Preferred Volume: 4 mL serum
Minimum Volume: 2 mL serum
Remarks: Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Stability (from collection to initiation): If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions: Hemolyzed sample

PROCESSING

Test Code: ILCAS
Test Group: HLA Antibody Testing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
4 mL serum  
**Minimum Volume:**  
2 mL serum  
**Unacceptable Conditions:**  
Hemolyzed sample  
**Stability (from collection to initiation):**  
If kept at ambient temperature, can be good for up to 72 hours

**RESULT INTERPRETATION**

**Additional Information:**  
This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**ADMINISTRATIVE**

**CPT Codes:**  
86808

**COMPLETE VIEW**

**Available Stat:**  
Yes  
**Test Code:**  
ILCAS  
**Test Group:**  
HLA Antibody Testing  
**Performing Lab:**  
Immunogenetics & Transplantation Laboratory (ITL)  
**Sendout:**  
Yes  
**Methodology:**  
Cytotoxicity  
**Remarks:**  
Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387  
**Collect:**  
Red top  
**Amount to Collect:**  
6 mL blood  
**Sample Type:**  
Serum  
**Preferred Volume:**  
4 mL serum  
**Minimum Volume:**  
2 mL serum  
**Unacceptable Conditions:**  
Hemolyzed sample  
**Specimen Preparation:**  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.  
**Synonyms:**  
- Quickscreen, PRA by Cytotoxicity  
**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 21 working days.

**Additional Information:**
This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86808
Daratumumab-Specific, Immunofixation

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Immunofixation
Reported: 4-6 days
Additional Information:

Daratumumab is an anti-CD38 IgGk monoclonal antibody currently in clinical development for multiple myeloma (MM) treatment. In MM, malignant cells secrete high levels of monoclonal immunoglobulin (M-protein) that is commonly detectable by serum immunofixation electrophoresis (IFE). As immunoglobulin, daratumumab also can be detected in IFE and may co-migrate with M-protein in a subset of patients (~50% of MM patient produce IgGk M protein). Addition of anti-idiotypic antibodies raised against daratumumab to patient serum containing daratumumab alters banding pattern as assessed to IFE (daratumumab shift) by forming a Daratumumab and anti-Daratumumab complex, helping to distinguish between therapeutic monoclonal antibody and M-protein present in the serum.

COLLECTION

Patient Preparation:
Overnight fasting is preferred.
Sample Type:
Serum
Collect:
Gold top or red top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Stability (from collection to initiation):
Room temperature: 5 days
Refrigerated: 6 days
Frozen: 6 months
Rejection Criteria:
Specimens other than serum

PROCESSING

Test Code: DARA
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Aliquot on freeze serum. Send sample to CB frozen. Order Quest test code 94514.
Preferred Volume:  
2 mL serum

Minimum Volume:  
1 mL serum

Rejection Criteria:  
Specimens other than serum

Stability (from collection to initiation):

- Room temperature: 5 days
- Refrigerated: 6 days
- Frozen: 6 months

RESULT INTERPRETATION

Additional Information:

Daratumumab is an anti-CD38 IgGk monoclonal antibody currently in clinical development for multiple myeloma (MM) treatment. In MM, malignant cells secrete high levels of monoclonal immunoglobulin (M-protein) that is commonly detectable by serum immunofixation electrophoresis (IFE). As immunoglobulin, daratumumab also can be detected in IFE and may co-migrate with M-protein in a subset of patients (~50% of MM patient produce IgGk M protein). Addition of anti-idiotypic antibodies raised against daratumumab to patient serum containing daratumumab alters banding pattern as assessed to IFE (daratumumab shift) by forming a Daratumumab and anti-Daratumumab complex, helping to distinguish between therapeutic monoclonal antibody and M-protein present in the serum.

ADMINISTRATIVE

CPT Codes:  
86334

LOINC Codes:  
NG

COMPLETE VIEW

Available Stat:  
No

Test Code:  
DARA

Performing Lab:  
Quest

Sendout:  
Yes

Methodology:  
Immunofixation

Patient Preparation:  
Overnight fasting is preferred.

Collect:  
Gold top or red top

Amount to Collect:  
4 mL blood

Sample Type:  
Serum

Preferred Volume:  
2 mL serum

Minimum Volume:  
1 mL serum
Rejection Criteria:
Specimens other than serum

Specimen Preparation:
Aliquot on freeze serum. Send sample to CB frozen. Order Quest test code 94514.

Stability (from collection to initiation):
Room temperature: 5 days
Refrigerated: 6 days
Frozen: 6 months

Reported:
4-6 days

Additional Information:
Daratumumab is an anti-CD38 IgGk monoclonal antibody currently in clinical development for multiple myeloma (MM) treatment. In MM, malignant cells secrete high levels of monoclonal immunoglobulin (M-protein) that is commonly detectable by serum immunofixation electrophoresis (IFE). As immunoglobulin, daratumumab also can be detected in IFE and may co-migrate with M-protein in a subset of patients (~50% of MM patient produce IgGk M protein). Addition of anti-idiotypic antibodies raised against daratumumab to patient serum containing daratumumab alters banding pattern as assessed to IFE (daratumumab shift) by forming a Daratumumab and anti-Daratatumumab complex, helping to distinguish between therapeutic monoclonal antibody and M-protein present in the serum.

CPT Codes:
86334

LOINC Codes:
NG
DAT Negative Hemolytic Anemia Work-up
MOLT

ORDERING

Approval Required:
Yes, by Hematology, BMT Service or Blood Bank.

Performing Lab:
American Red Cross Immunohematology Reference Lab (Pomona, CA)

Performed:
Test set up Monday - Thursday

Reported:
4-7 days

Additional Information:
Test is typically sent out only if a DAT done in the preceding 3 days is negative for IgG. Order DAT, if needed.

Synonyms:
- Super Coombs Test

COLLECTION

Sample Type:
Whole blood

Collect:
Lavender top

Amount to Collect:
See Preferred Volume.

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Remarks:
Collect specimen Monday through Thursday only.

Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
American Red Cross Immunohematology Reference Lab (Pomona, CA)

Specimen Preparation:
Send samples to Blood Bank to be shipped to American Red Cross Reference Lab. Do not separate plasma or serum.

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.
RESULT INTERPRETATION

Additional Information:
Test is typically sent out only if a DAT done in the preceding 3 days is negative for IgG. Order DAT, if needed.

COMPLETE VIEW

Approval Required:
Yes, by Hematology, BMT Service or Blood Bank.
Test Code:
MOLT
Performing Lab:
American Red Cross Immunohematology Reference Lab (Pomona, CA)
Sendout:
Yes
Performed:
Test set up Monday - Thursday
Remarks:
Collect specimen Monday through Thursday only.
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.
Collect:
Lavender top
Amount to Collect:
See Preferred Volume.
Sample Type:
Whole blood
Preferred Volume:
6 mL
Minimum Volume:
3 mL
Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.
Specimen Preparation:
Send samples to Blood Bank to be shipped to American Red Cross Reference Lab. Do not separate plasma or serum.
Synonyms:
- Super Coombs Test
Reported:
4-7 days
Additional Information:
Test is typically sent out only if a DAT done in the preceding 3 days is negative for IgG. Order DAT, if needed.
Dehydroepiandrosterone
DHEA

ORDERING

Available Stat: No
Performing Lab: ESCI
Methodology: Chromatography, RIA
Reported: Test performed three times a week. Turnaround time: 2-5 days.
Additional Information: The level varies diurnally, and is highest in the a.m.
Synonyms: DHEA

COLLECTION

Patient Preparation: An 8 hour fast before specimen collection in a.m. is preferred.
Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum

PROCESSING

Test Code: DHEA
Sendout: Yes
Performing Lab: ESCI
Specimen Preparation: Separate serum immediately and freeze at -20C. Order Esoterix Test #500116.
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum

RESULT INTERPRETATION

Units: ng/dL
Reference Interval:
1-5 years: <68 ng/dL
6-7 years: <111 ng/dL
8-10 years: <186 ng/dL
11-12 years: <202 ng/dL
13-14 years: <319 ng/dL
15-16 years: 39-481 ng/dL
17-19 years: 40-491 ng/dL
20-50 years: 31-701 ng/dL

Additional Information:

The level varies diurnally, and is highest in the a.m.

ADMINISTRATIVE

CPT Codes:

82626-90

LOINC Codes:

2193-1

COMPLETE VIEW

Available Stat:

No

Test Code:

DHEA

Performing Lab:

ESCI

Sendout:

Yes

Methodology:

Chromatography, RIA

Patient Preparation:

An 8 hour fast before specimen collection in a.m. is preferred.

Collect:

Gold top

Amount to Collect:

1 mL blood

Sample Type:

Serum

Preferred Volume:

0.5 mL serum

Minimum Volume:

0.3 mL serum

Specimen Preparation:

Separate serum immediately and freeze at -20C. Order Esoterix Test #500116.

Units:

ng/dL

Reference Interval:

1-5 years: <68 ng/dL
6-7 years: <111 ng/dL
8-10 years: <186 ng/dL
11-12 years: <202 ng/dL
13-14 years: <319 ng/dL
15-16 years: 39-481 ng/dL
17-19 years: 40-491 ng/dL
20-50 years: 31-701 ng/dL

Synonyms:

• DHEA
Reported:
Test performed three times a week. Turnaround time: 2-5 days.

Additional Information:
The level varies diurnally, and is highest in the a.m.

CPT Codes:
82626-90

LOINC Codes:
2193-1
Dehydroepiandrosterone Sulfate

ORDERING

Available Stat:
  No
Performing Lab:
  China Basin Chemistry
Performed:
  Monday (day shift)
Methodology:
  Chemiluminescent immunoassay (Siemens Immulite 2000)
Reported:
  1-8 days
Additional Information:
  This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.
  To convert µg/dL to µmol/L (SI units) multiply by 0.026.
  Reference ranges adopted from Quest Diagnostics laboratory.
Synonyms:
  • DHEAS

COLLECTION

Sample Type:
  Serum
Collect:
  Gold top
Amount to Collect:
  2 mL blood
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.1 mL serum

PROCESSING

Test Code:
  DHES
Test Group:
  DHEAS
Performing Lab:
  China Basin Chemistry
Specimen Preparation:
  Freeze serum at -20C.
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.1 mL serum

RESULT INTERPRETATION
Units:
\( \mu g/dL \)

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29 years</td>
<td>110-510 ug/dL</td>
<td>45-320 ug/dL</td>
</tr>
<tr>
<td>30-39 years</td>
<td>110-370 ug/dL</td>
<td>40-325 ug/dL</td>
</tr>
<tr>
<td>40-49 years</td>
<td>45-345 ug/dL</td>
<td>25-220 ug/dL</td>
</tr>
<tr>
<td>50-59 years</td>
<td>25-240 ug/dL</td>
<td>15-170 ( \mu g/dL )</td>
</tr>
<tr>
<td>60-69 years</td>
<td>25-95 ug/dL</td>
<td>&lt;186 ug/dL</td>
</tr>
<tr>
<td>70-90 years</td>
<td>&lt;76 ( \mu g/dL )</td>
<td>&lt;91 ( \mu g/dL )</td>
</tr>
</tbody>
</table>

Note: the reference ranges have been adopted from Quest Diagnostics-San Juan Capistrano based on correlation studies and same methodology.

**Additional Information:**

- This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.
- To convert \( \mu g/dL \) to \( \mu mol/L \) (SI units) multiply by 0.026.
- Reference ranges adopted from Quest Diagnostics laboratory.

**ADMINISTRATIVE**

**CPT Codes:**
- 82627

**LOINC Codes:**
- 2191-5

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- DHES

**Test Group:**
- DHEAS

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Monday (day shift)

**Methodology:**
- Chemiluminescent immunoassay (Siemens Immulite 2000)

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Specimen Preparation:**
- Freeze serum at -20C.

**Units:**
- \( \mu g/dL \)
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
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<tr>
<td>30-39 years</td>
<td>110-370 ug/dL</td>
<td>40-325 ug/dL</td>
</tr>
<tr>
<td>40-49 years</td>
<td>45-345 ug/dL</td>
<td>25-220 ug/dL</td>
</tr>
<tr>
<td>50-59 years</td>
<td>25-240 ug/dL</td>
<td>15-170 µg/dL</td>
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<tr>
<td>60-69 years</td>
<td>25-95 µg/dL</td>
<td>&lt;186 µg/dL</td>
</tr>
<tr>
<td>70-90 years</td>
<td>&lt;76 µg/dL</td>
<td>&lt;91 µg/dL</td>
</tr>
</tbody>
</table>

Note: the reference ranges have been adopted from Quest Diagnostics-San Juan Capistrano based on correlation studies and same methodology.

Synonyms:
- DHEAS

Reported:
1-8 days

Additional Information:
This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

To convert µg/dL to µmol/L (SI units) multiply by 0.026.

Reference ranges adopted from Quest Diagnostics laboratory.

CPT Codes:
- 82627

LOINC Codes:
- 2191-5
Dehydroepiandrosterone Sulfate, Pediatric
PDHES

ORDERING

Available Stat: No
Performing Lab: Esoterix
Methodology: RIA after hydrolysis
Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by 0.026.

This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Dehydroepiandrosterone Sulfate" (test code DHES). It requires approval if ordered in patients over the age of 20.

Synonyms:
- DHEAS ultrasensitive

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect:
- 1 mL blood
Preferred Volume:
- 0.5 mL serum
Minimum Volume:
- 0.2 mL serum
Remarks:
Bring sample immediately to laboratory for processing.
Unacceptable Conditions:
Delivered to lab > 30 min after collection

PROCESSING

Test Code: PDHES
Test Group: DHEAS
Sendout: Yes
Performing Lab: Esoterix
Specimen Preparation:
Separate serum within 1 hour of collection and freeze at -20C. Ship frozen.
Preferred Volume:
- 0.5 mL serum
Minimum Volume:
- 0.2 mL serum
Unacceptable Conditions:
Delivered to lab > 30 min after collection
RESULT INTERPRETATION

Units:

µg/dL

Reference Interval:

Premature Infants
26-28 weeks, day 4 123-882
31-35 weeks, day 4 122-710

Full Term Infants
3 days 88-356
1-12 months 5-111 by first month
5-48 by six months

Prepubertal
1-5 years <5-57
6-7 years 9-72
8-10 years 13-115

Tanner Stage Males Females
I 13-83 19-144
II 42-109 32-129
III 48-200 32-226
IV 102-385 58-260
V 120-370 44-248

Additional Information:

To convert µg/dL to µmol/L (SI units) multiply by 0.026.

This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Dehydroepiandrosterone Sulfate" (test code DHES). It requires approval if ordered in patients over the age of 20.

ADMINISTRATIVE

CPT Codes:

82627-90

LOINC Codes:

2191-5

COMPLETE VIEW

Available Stat:

No

Test Code:

PDHES

Test Group:

DHEAS

Performing Lab:

Esoterix

Sendout:

Yes

Methodology:

RIA after hydrolysis

Remarks:

Bring sample immediately to laboratory for processing.

Collect:
Gold top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
Delivered to lab > 30 min after collection

**Specimen Preparation:**
Separate serum within 1 hour of collection and freeze at -20°C. Ship frozen.

**Units:**
µg/dL

**Reference Interval:**
- Premature Infants
  - 26-28 weeks, day 4: 123-882
  - 31-35 weeks, day 4: 122-710

- Full Term Infants
  - 3 days: 88-356
  - 1-12 months: 5-111 by first month
    - 5-48 by six months

- Prepubertal
  - 1-5 years: <5-57
  - 6-7 years: 9-72
  - 8-10 years: 13-115

<table>
<thead>
<tr>
<th>Tanner Stage</th>
<th>Males</th>
<th>Females</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>13-83</td>
<td>19-144</td>
</tr>
<tr>
<td>II</td>
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<tr>
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</tr>
<tr>
<td>V</td>
<td>120-370</td>
<td>44-248</td>
</tr>
</tbody>
</table>

**Synonyms:**
- DHEAS ultrasensitive

**Additional Information:**
To convert µg/dL to µmol/L (SI units) multiply by 0.026.

This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Dehydroepiandrosterone Sulfate" (test code DHES). It requires approval if ordered in patients over the age of 20.

**CPT Codes:**
82627-90

**LOINC Codes:**
2191-5
Deletion 11Q ATM FISH
DEL11Q, BD11Q

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily Monday - Friday
Methodology:
Fluorescent In-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
- ATM Deletion 11q22.3
- DEL11Q
- BD11Q

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy
Collect:
Dark green top (Sodium heparin)
Amount to Collect:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING

Test Code:
- BD11Q: Blood
- DEL11Q: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Keep at room temperature, do not centrifuge
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
- Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
- Absent

ADMINISTRATIVE

CPT Codes:
- 88271, 88271, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BD11Q: Blood
- DEL11Q: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Set up daily Monday - Friday

Methodology:
- Fluorescent In-situ hybridization (FISH)

Remarks:
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
- Dark green top (Sodium heparin)

Amount to Collect:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
- Heparinized whole blood or bone marrow. Bone marrow biopsy

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Unacceptable Conditions:
   Frozen, leaking or unlabeled samples

Specimen Preparation:
   Keep at room temperature, do not centrifuge

Reference Interval:
   Absent

Synonyms:
   • ATM Deletion 11q22.3
   • DEL11Q
   • BD11Q

Stability (from collection to initiation):
   Room temperature 2 days

Reported:
   1-2 weeks

CPT Codes:
   88271,88271,88275

LDT or Modified FDA:
   Yes
Deletion 13Q FISH
DEL13Q, BD13Q

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily Monday - Friday
Methodology:
Fluorescent In-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
- D13S319/13q34Deletion
- DEL13Q
- BD13Q

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy
Collect:
Dark green top (Sodium heparin)
Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING

Test Code:
BD13Q: Blood
DEL13Q: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Keep at room temperature, do not centrifuge
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
- Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
- Absent

ADMINISTRATIVE

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BD13Q: Blood
- DEL13Q: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Set up daily Monday - Friday

Methodology:
- Fluorescent In-situ hybridization (FISH)

Remarks:
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
- Dark green top (Sodium heparin)

Amount to Collect:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Sample Type:
- Heparinized whole blood or bone marrow. Bone marrow biopsy

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Unacceptable Conditions:
  Frozen, leaking or unlabeled samples

Specimen Preparation:
  Keep at room temperature, do not centrifuge

Reference Interval:
  Absent

Synonyms:
  - D13S319/13q34Deletion
  - DEL13Q
  - BD13Q

Stability (from collection to initiation):
  Room temperature 2 days

Reported:
  1-2 weeks

CPT Codes:
  88271 x2, 88275

LDT or Modified FDA:
  Yes
Deletion 17P FISH
DEL17P, BD17P

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily Monday - Friday
Methodology:
Fluorescent In-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
• TP53 Deletion
• DEL17P

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy
Collect:
Dark green top (Sodium heparin)
Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING

Test Code:
BD17P: Blood
DEL17P: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Keep at room temperature, do not centrifuge
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
Absent

ADMINISTRATIVE

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
BD17P: Blood
DEL17P: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily Monday - Friday

Methodology:
Fluorescent In-situ hybridization (FISH)

Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
Dark green top (Sodium heparin)

Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Frozen, leaking or unlabeled samples

**Specimen Preparation:**
- Keep at room temperature, do not centrifuge

**Reference Interval:**
- Absent

**Synonyms:**
- TP53 Deletion
- DEL17P

**Stability (from collection to initiation):**
- Room temperature 2 days

**Reported:**
- 1-2 weeks

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes
Deletion 20q FISH
DEL20Q, BD20Q

ORDERING

Available Stat:
No
Performing Lab:
   Medical Genomics - Cytogenetics
Methodology:
   Fluorescent in-situ hybridization (FISH)
Reported:
   1-2 weeks
Synonyms:
   - Del20q
   - BD20Q

COLLECTION

Sample Type:
   Heparinized whole blood, bone marrow aspirate, bone core
Collect:
   Dark green top (Na-heparin)
Amount to Collect:
   Whole blood: 2 mL
   Bone marrow aspirate: 2 mL
   Bone marrow biopsy: 2 cm
Preferred Volume:
   Whole blood: 2 mL
   Bone marrow aspirate: 2 mL
   Bone marrow biopsy: 2 cm
Minimum Volume:
   Whole blood: 1 mL
   Bone marrow aspirate: 1 mL
   Bone marrow biopsy: 2 cm
Remarks:
   Maintain sample at room temperature.

PROCESSING

Test Code:
   BD20Q: Blood
   DEL20Q: Bone marrow
Test Group:
   Oncology FISH
Performing Lab:
   Medical Genomics - Cytogenetics
Specimen Preparation:
   Maintain sample at room temperature
Preferred Volume:
   Whole blood: 2 mL
   Bone marrow aspirate: 2 mL
   Bone marrow biopsy: 2 cm
Minimum Volume:
   Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 2 cm

RESULT INTERPRETATION

Reference Interval:
No deletion detected

ADMINISTRATIVE

CPT Codes:
88271, 88275
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
  BD20Q: Blood
  DEL20Q: Bone marrow
Test Group:
  Oncology FISH
Performing Lab:
  Medical Genomics - Cytogenetics
Methodology:
  Fluorescent in-situ hybridization (FISH)
Remarks:
  Maintain sample at room temperature.
Collect:
  Dark green top (Na-heparin)
Amount to Collect:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm
Sample Type:
  Heparinized whole blood, bone marrow aspirate, bone core
Preferred Volume:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm
Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL
  Bone marrow biopsy: 2 cm
Specimen Preparation:
  Maintain sample at room temperature
Reference Interval:
No deletion detected
Synonyms:
  • Del20q
  • BD20Q
Reported:
  1-2 weeks
CPT Codes:
  88271, 88275
LDT or Modified FDA:
  Yes
Deletion 9p Metaphase FISH
DEL9P, BD9P

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-Situ Hybridization
Reported: 1-2 weeks
Synonyms:
- Del9p
- Deletion CDKN2A FISH
- BD9P

COLLECTION

Sample Type:
- Heparinized blood or bone marrow aspirate
- Bone biopsy
Collect:
- Blood or marrow aspirate Dark Green top
Amount to Collect:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Remarks:
- Mix blood and marrow aspirates well
Stability (from collection to initiation):
- 2 days at room temperature
Unacceptable Conditions:
- Insufficient sample or not collected in heparin

PROCESSING

Test Code:
- BD9P: Blood
- DEL9P: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Insufficient sample or not collected in heparin

Stability (from collection to initiation):
2 days at room temperature

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes

Available Stat:
No

Test Code:
BD9P: Blood
DEL9P: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Methodology:
Fluorescent in-Situ Hybridization

Remarks:
Mix blood and marrow aspirates well

Collect:
Blood or marrow aspirate Dark Green top

Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Sample Type:
Heparinized blood or bone marrow aspirate
Bone biopsy

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:
Insufficient sample or not collected in heparin

Specimen Preparation:
Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

Synonyms:
- Del9p
- Deletion CDKN2A FISH
- BD9P

**Stability (from collection to initiation):**

- 2 days at room temperature

**Reported:**

- 1-2 weeks

**CPT Codes:**

- 88271 x2, 88275

**LDT or Modified FDA:**

- Yes
**Delta-Aminolevulinic Acid Quantitative, 24 hour urine**

**ALAQ**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Colorimetric

**Reported:**
- Test performed Tuesday and Thursday. Turnaround time: 2-7 days.

**Additional Information:**
- To convert mg/d to µmol/d (SI units) multiply by 7.626.

- This test should almost always be ordered in conjunction with Porphobilinogen (PBG) when the diagnosis of Acute Intermittent Porphyria is being considered.

**Synonyms:**
- ALA
- D-ALA
- DALA
- D-aminolevulenic acid
- Porphyrin precursors
- Porphyria

### COLLECTION

**Sample Type:**
- 24 hour urine collection

**Collect:**
- Brown 24 hour urine collection container

**Amount to Collect:**
- Entire 24 hour urine output

**Preferred Volume:**
- 15 mL urine

**Minimum Volume:**
- 3 mL urine

**Remarks:**
- Obtain a special brown 24 hour urine collection container from Specimen Receiving.

- It is critically important that the sample be refrigerated and shielded from light during collection by covering container with aluminum foil.

**Unacceptable Conditions:**
- Sample not refrigerated during collection or shielded from light

### PROCESSING

**Test Code:**
- ALAQ

**Test Group:**
- D-ALA

**Sendout:**
- Yes
Performing Lab:
Quest

Specimen Preparation:
Freeze aliquot in dark pouroff container [or wrap container in aluminum foil] at -20C. Record total urine volume on the request slip and on the urine container. Order Quest test # 219.

Preferred Volume:
15 mL urine

Minimum Volume:
3 mL urine

Unacceptable Conditions:
Sample not refrigerated during collection or shielded from light

RESULT INTERPRETATION

Units:
mg/24 h

Reference Interval:
<4.5 mg/24 h

Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 7.626.

This test should almost always be ordered in conjunction with Porphobilinogen (PBG) when the diagnosis of Acute Intermittent Porphyria is being considered.

ADMINISTRATIVE

CPT Codes:
82135-90

LOINC Codes:
2200-4

COMPLETE VIEW

Available Stat:
No

Test Code:
ALAQ

Test Group:
D-ALA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Colorimetric

Remarks:
Obtain a special brown 24 hour urine collection container from Specimen Receiving.

It is critically important that the sample be refrigerated and shielded from light during collection by covering container with aluminum foil.

Collect:
Brown 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection
Preferred Volume:
15 mL urine

Minimum Volume:
3 mL urine

Unacceptable Conditions:
Sample not refrigerated during collection or shielded from light

Specimen Preparation:
Freeze aliquot in dark pouroff container [or wrap container in aluminum foil] at -20C. Record total urine volume on the request slip and on the urine container. Order Quest test # 219.

Units:
mg/24 h

Reference Interval:
<4.5 mg/24 h

Synonyms:
- ALA
- D-ALA
- DALA
- D-aminolevulenic acid
- Porphyrin precursors
- Porphyria

Reported:
Test performed Tuesday and Thursday. Turnaround time: 2-7 days.

Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 7.626.

This test should almost always be ordered in conjunction with Porphobilinogen (PBG) when the diagnosis of Acute Intermittent Porphyria is being considered.

CPT Codes:
82135-90

LOINC Codes:
2200-4
Delta-Aminolevulinic Acid Quantitative, random urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Colorimetric
Reported:
Test run 2x per week. TAT 6-8 days
Additional Information:
This test is the usual first step in the diagnosis acute intermittent porphyria. Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or enviromental factors.

Synonyms:
• ALA
• D-ALA
• DALA
• D-aminolevulenic acid
• Porphyrin precursors
• Porphyria

COLLECTION

Patient Preparation:
Do not use first morning void, late evening specimen (after 8:00 pm), or specimen after excessive fluid intake. Recommend patient to collect urine specimen and submit to laboratory on-site to maintain specimen stability.
Sample Type:
Random urine
Collect:
Urine cup wrapped in aluminum foil.
Amount to Collect:
See preferred volume
Preferred Volume:
2 mL urine
Minimum Volume:
0.6 mL urine
Remarks:
Cover urine cup with foil to protect sample from light and refrigerate.
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month.

PROCESSING

Test Code:
ALAQR
Test Group:
D-ALA
Sendout:
Yes
Performing Lab:
Quest

Specimen Preparation:
Aliquot urine into a dark brown tube and refrigerate. Order Quest test # 6301.

Preferred Volume:
2 mL urine
Minimum Volume:
0.6 mL urine

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
mg/g creatinine

Reference Interval:

Pediatric:
1 - 8 years: 2.3-6.2 mg/g creat
9 - 17 years: 1.5-5.3 mg/g creat

>= 18 years:
Females: <5.4 mg/g creat
Males: <1.8 mg/g creat

Additional Information:
This test is the usual first step in the diagnosis acute intermittent porphyria. Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or enviromental factors.

ADMINISTRATIVE

CPT Codes:
82135-90

LOINC Codes:
13728-1

COMPLETE VIEW

Available Stat:
No

Test Code:
ALAQR

Test Group:
D-ALA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Colorimetric

Patient Preparation:
Do not use first morning void, late evening specimen (after 8:00 pm), or specimen after excessive fluid intake. Recommend patient to collect urine specimen and submit to laboratory on-site to maintain specimen stability.

Remarks:
Cover urine cup with foil to protect sample from light and refrigerate.

Collect:
Urine cup wrapped in aluminum foil.
**Amount to Collect:**
See preferred volume

**Sample Type:**
Random urine

**Preferred Volume:**
2 mL urine

**Minimum Volume:**
0.6 mL urine

**Specimen Preparation:**
Aliquot urine into a dark brown tube and refrigerate. Order Quest test # 6301.

**Units:**
mg/g creatinine

**Reference Interval:**

- **Pediatric:**
  - 1 - 8 years: 2.3-6.2 mg/g creat
  - 9 - 17 years: 1.5-5.3 mg/g creat

- **>= 18 years:**
  - Females: <5.4 mg/g creat
  - Males: <1.8 mg/g creat

**Synonyms:**
- ALA
- D-ALA
- DALA
- D-aminolevulenic acid
- Porphyrin precursors
- Porphyria

**Stability (from collection to initiation):**
Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month.

**Reported:**
Test run 2x per week. TAT 6-8 days

**Additional Information:**
This test is the usual first step in the diagnosis acute intermittent porphyria. Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or environmental factors.

**CPT Codes:**
- 82135-90

**LOINC Codes:**
- 13728-1
**Dengue Antibodies, IgG & IgM**

**DENGF**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Focus via Quest

**Methodology:**
ELISA

**Reported:**
Set up 4x per week, turnaround 4-6 days

**Additional Information:**
Assay detects both IgG and IgM antibodies. Dengue hemorrhagic fever and Dengue shock syndrome are caused by infection of a RNA flavivirus transmitted by a mosquito vector. Paired acute and convalescent specimens that exhibit a significant change in titer are useful to confirm clinical diagnosis of infection.

**Synonyms:**
- Dengue hemorrhagic fever
- Dengue shock syndrome

### COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top or Gold top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

### PROCESSING

**Test Code:**
DENGF

**Test Group:**
Dengue

**Sendout:**
Yes

**Performing Lab:**
Focus via Quest

**Specimen Preparation:**
Ship at room temperature. Order Quest test # 34301X

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.
RESULT INTERPRETATION

Units:
Index

Reference Interval:
IgG: <0.90
IgM: <0.90

Additional Information:
Assay detects both IgG and IgM antibodies. Dengue hemorrhagic fever and Dengue shock syndrome are caused by infection of a RNA flavivirus transmitted by a mosquito vector. Paired acute and convalescent specimens that exhibit a significant change in titer are useful to confirm clinical diagnosis of infection.

ADMINISTRATIVE

CPT Codes:
86790-90

LOINC Codes:
41878-0

COMPLETE VIEW

Available Stat:
No

Test Code:
DENGF

Test Group:
Dengue

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
ELISA

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Ship at room temperature. Order Quest test # 34301X

Units:
Index

Reference Interval:
IgG: <0.90
IgM: <0.90

Synonyms:
• Dengue hemorrhagic fever
• Dengue shock syndrome

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

**Reported:**
- Set up 4x per week, turnaround 4-6 days

**Additional Information:**
- Assay detects both IgG and IgM antibodies. Dengue hemorrhagic fever and Dengue shock syndrome are caused by infection of a RNA flavivirus transmitted by a mosquito vector. Paired acute and convalescent specimens that exhibit a significant change in titer are useful to confirm clinical diagnosis of infection.

**CPT Codes:**
- 86790-90

**LOINC Codes:**
- 41878-0
Deoxycortisol, 11-, specific
CSPE

ORDERING

Available Stat:
No
Performing Lab:
ESCI
Methodology:
RIA
Reported:
Test performed Monday-Wednesday-Friday. Turnaround time: 6-10 days.
Additional Information:
For evaluation of adrenogenital syndrome. Not for use in Metiropone stimulation testign. To convert ng/dL to nmol/L multiply by 0.029
Synonyms:
• Deoxycortisol, 11- post extraction
• Adrenogenital syndrome

COLLECTION

Patient Preparation:
An early morning specimen is preferred.
Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
An early morning specimen is preferred.

PROCESSING

Test Code:
CSPE
Test Group:
Deoxycortisol, 11-
Sendout:
Yes
Performing Lab:
ESCI
Specimen Preparation:
Process immediately. Freeze serum at -20C.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
RESULT INTERPRETATION

Units:
ng/dL

Reference Interval:
- Cord blood: 295-554 ng/dL
- Premature infants: 48-579 ng/dL
- Full-term infants:
  - 3 days: 13-147 ng/dL
  - 1-12 months: < 156 ng/dL
- Pre-pubertal child (1-10 y/o) [0800 hours]: 20-155 ng/dL
- >= 18 year olds [0800 hours]: 12-158 ng/dL

Additional Information:
For evaluation of adrenogenital syndrome. Not for use in Metiropone stimulation testing. To convert ng/dL to nmol/L multiply by 0.029

ADMINISTRATIVE

CPT Codes:
- 82634-90

LOINC Codes:
- 1657-6

COMPLETE VIEW

Available Stat:
No

Test Code:
CSPE

Test Group:
- Deoxycortisol, 11-

Performing Lab:
ESCI

Sendout:
Yes

Methodology:
RIA

Patient Preparation:
An early morning specimen is preferred.

Remarks:
An early morning specimen is preferred.

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Process immediately. Freeze serum at -20C.

Units:
ng/dL
Reference Interval:
- Cord blood: 295-554 ng/dL
- Premature infants: 48-579 ng/dL

Full-term infants:
- 3 days: 13-147 ng/dL
- 1-12 months: < 156 ng/dL

Pre-pubertal child (1-10 y/o) [0800 hours]: 20-155 ng/dL

>= 18 year olds [0800 hours]: 12-158 ng/dL

Synonyms:
- Deoxycortisol, 11- post extraction
- Adrenogenital syndrome

Reported:
- Test performed Monday-Wednesday-Friday. Turnaround time: 6-10 days.

Additional Information:
- For evaluation of adrenogenital syndrome. Not for use in Metiropone stimulation testign. To convert ng/dL to nmol/L multiply by 0.029

CPT Codes:
- 82634-90

LOINC Codes:
- 1657-6
Des-gamma-carboxy Prothrombin

DCP

ORDERING

Ordering Recommendations:
Surveillance and monitoring of hepatocellular carcinoma.

Performing Lab:
ARUP

Performed:
Mon, Thu

Methodology:
Quantitative Liquid Chromatography/Immunoassay

Reported:
1-5 days

Synonyms:
• DCP, PIVKA-II
• DCP
• PIVKA-II

COLLECTION

Sample Type:
SERUM

Collect:
Plain red or serum separator tube.

Amount to Collect:
2 mL (blood)

Preferred Volume:
1 mL (serum)

Minimum Volume:
0.5 mL (serum)

Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Plasma.

PROCESSING

Test Code:
DCP

ARUP Test Code:
0081312

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Preferred Volume:
1 mL (serum)

Minimum Volume:
0.5 mL (serum)

Unacceptable Conditions:
Plasma.

Stability (from collection to initiation):
After separation from cells: Ambient: 8 hours; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
Effective August 20, 2012
0.0 - 7.4 ng/mL

Interpretive Data:
The µTASWako method is used. Results obtained with different assay methods or kits cannot be used interchangeably. The des-gamma-carboxy prothrombin (DCP) assay is intended as a risk assessment for the development of hepatocellular carcinoma in patients with chronic liver diseases. Elevated DCP values have been shown to be associated with an increased risk for developing hepatocellular carcinoma. Patients with elevated serum DCP should be more intensely evaluated for evidence of hepatocellular carcinoma.

ADMINISTRATIVE

CPT Codes:
83951

LOINC Codes:
34444-0

COMPLETE VIEW

Ordering Recommendations:
Surveillance and monitoring of hepatocellular carcinoma.

Test Code:
DCP

ARUP Test Code:
0081312

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon, Thu

Methodology:
Quantitative Liquid Chromatography/Immunoassay

Collect:
Plain red or serum separator tube.

Amount to Collect:
2 mL (blood)

Sample Type:
SERUM

Preferred Volume:
1 mL (serum)

**Minimum Volume:**
0.5 mL (serum)

**Unacceptable Conditions:**
Plasma.

**Specimen Preparation:**
Allow specimen to clot completely at room temperature. Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

**Units:**
ng/mL

**Reference Interval:**
Effective August 20, 2012

0.0 - 7.4 ng/mL

**Interpretive Data:**
The µTASWako method is used. Results obtained with different assay methods or kits cannot be used interchangeably. The des-gamma-carboxy prothrombin (DCP) assay is intended as a risk assessment for the development of hepatocellular carcinoma in patients with chronic liver diseases. Elevated DCP values have been shown to be associated with an increased risk for developing hepatocellular carcinoma. Patients with elevated serum DCP should be more intensely evaluated for evidence of hepatocellular carcinoma.

**Synonyms:**
- DCP, PIVKA-II
- DCP
- PIVKA-II

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 8 hours; Refrigerated: 1 week; Frozen: 3 weeks (avoid repeated freeze/thaw cycles)

**Reported:**
1-5 days

**CPT Codes:**
83951

**LOINC Codes:**
34444-0
Desipramine
DESI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Liquid Chromatography Tandem Mass Spectrometry
Reported:
Test performed 4 x per week. Turnaround time 3-5 days.
Additional Information:
If both Desipramine and Imipramine are desired, order Imipramine only. Potentially toxic: > 500.
Synonyms:
- Norpramin
- Pertofrane

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum
Remarks:
Do not use Gold top. If both Desipramine and Imipramine are desired, order Imipramine only.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
DESI
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate serum promptly. Freeze at -20C.
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum
Unacceptable Conditions:
Collected in Gold top
RESULT INTERPRETATION

Units:

µg/L (mcg/L)

Reference Interval:
Therapeutic 50-300 µg/L when given as parent drug

Critical Values:
Quest Priority-1: >= 600 µg/L

Additional Information:
If both Desipramine and Imipramine are desired, order Imipramine only. Potentially toxic: > 500.

ADMINISTRATIVE

CPT Codes:
80335-90

LOINC Codes:
3531-1

COMPLETE VIEW

Available Stat:
No

Test Code:
DESI

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography Tandem Mass Spectrometry

Remarks:
Do not use Gold top. If both Desipramine and Imipramine are desired, order Imipramine only.

Collect:
Red top

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Separate serum promptly. Freeze at -20C.

Units:

µg/L (mcg/L)

Reference Interval:
Therapeutic 50-300 µg/L when given as parent drug

Critical Values:
Quest Priority-1: >= 600 µg/L

Synonyms:
• Norpramin
- Pertofrane

**Reported:**
Test performed 4 x per week. Turnaround time 3-5 days.

**Additional Information:**
If both Desipramine and Imipramine are desired, order Imipramine only. Potentially toxic: > 500.

**CPT Codes:**
80335-90

**LOINC Codes:**
3531-1
Desmoglein 1 and 3 Antibodies

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
ELISA
Reported:
7-9 days
Additional Information:

Pemphigus includes a group of often fatal autoimmune, blistering diseases characterized by intraepithelial lesions. Pemphigus vulgaris and its variants may present with oral or mucosal lesions alone or with mucosal plus skin lesions. Pemphigus foliaceous and variants present with skin lesions alone.

Indirect immunofluorescence (IIF) studies reveal that both forms of pemphigus are caused by autoantibodies to cell surface antigens of stratified epithelia or mucous membranes and skin. These antibodies bind to calcium-dependent adhesion molecules in cell surface desmosomes, notably desmoglein 1 (DSG1) in pemphigus foliaceus and desmoglein 3 (DSG3) and/or DSG1 in pemphigus vulgaris. Desmogleins are protein substances located in and on the surface of keratinocytes. These proteins have been shown to be a critical factor in cell-to-cell adhesion. Antibodies to desmogleins can result in loss of cell adhesion, the primary cause of blister formation in pemphigus.

The diagnosis of pemphigus depends on biopsy and serum studies that characterize lesions and detect the autoantibodies that cause them. Originally, the serum studies were performed by IIF using monkey esophagus and other tissue substrates. The identification of the reactive antigens as DSG1 and DSG3 has made it possible to develop highly specific and sensitive enzyme-linked immunosorbent assay (ELISA) methods.

Antibodies to desmoglein 1 (DSG1) and desmoglein 3 (DSG3) have been shown to be present in patients with pemphigus. Many patients with pemphigus foliaceus, a superficial form of pemphigus have antibodies to DSG1. Patients with pemphigus vulgaris, a deeper form of pemphigus, have antibodies to DSG3 and sometimes DSG1 as well.

Antibody titer correlates in a semiquantitative manner with disease activity in many patients. Patients with severe disease can usually be expected to have high titers of antibodies to DSG. Titers are expected to decrease with clinical improvement.

Our experience demonstrates a very good correlation between DSG1 and DSG3 results and the presence of pemphigus. Adequate sensitivities and specificity for disease are documented. However, in those patients strongly suspected to have pemphigus either by clinical findings or by routine biopsy, and in whom the DSG assay is negative, the IIF test (CIFS/8052 Cutaneous Immunofluorescence Antibodies [IgG], Serum) is recommended.

Synonyms:
- DSG1 Ab
- DSG1 Antibody
- DSG3 Ab
- DSG3 Antibody

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood

Printed 06/07/19
Test information subject to change
Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Stability (from collection to initiation):
Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks

Rejection Criteria:
Gross hemolysis, lipemia or icterus

PROCESSING

Test Code:
DSG

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Spin and freeze aliquot at -20C. Ship to China Basin.

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Gross hemolysis, lipemia or icterus

Stability (from collection to initiation):
Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks

RESULT INTERPRETATION

Units:
U

Reference Interval:
DESMoglein 1
Negative: <14.0 U
Indeterminate: 14.0-20.0 U
Positive: >20.0 U

DESMoglein 3
Negative: <9.0 U
Indeterminate: 9.0-20.0 U
Positive: >20.0 U

Additional Information:

Pemphigus includes a group of often fatal autoimmune, blistering diseases characterized by intraepithelial lesions. Pemphigus vulgaris and its variants may present with oral or mucosal lesions alone or with mucosal plus skin lesions. Pemphigus foliaceous and variants present with skin lesions alone.

Indirect immunofluorescence (IIF) studies reveal that both forms of pemphigus are caused by autoantibodies to cell surface antigens of stratified epithelia or mucous membranes and skin. These antibodies bind to calcium-dependent adhesion molecules in cell surface desmosomes, notably desmoglein 1 (DSG1) in pemphigus foliaceous and desmoglein 3 (DSG3) and/or DSG1 in pemphigus vulgaris. Desmogleins are protein substances located in and on the surface of keratinocytes. These proteins have been shown to be a critical factor in cell-to-cell adhesion. Antibodies to desmogleins can result in loss of cell adhesion, the primary cause of blister formation in pemphigus.

The diagnosis of pemphigus depends on biopsy and serum studies that characterize lesions and detect the autoantibodies that cause them. Originally, the serum studies were performed by IIF using monkey esophagus and other tissue substrates. The identification of the reactive antigens as DSG1 and DSG3 has made it possible to develop highly specific and sensitive enzyme-linked immunosorbent
assay (ELISA) methods.

Antibodies to desmoglein 1 (DSG1) and desmoglein 3 (DSG3) have been shown to be present in patients with pemphigus. Many patients with pemphigus foliaceus, a superficial form of pemphigus have antibodies to DSG1. Patients with pemphigus vulgaris, a deeper form of pemphigus, have antibodies to DSG3 and sometimes DSG1 as well.

Antibody titer correlates in a semiquantitative manner with disease activity in many patients. Patients with severe disease can usually be expected to have high titers of antibodies to DSG. Titers are expected to decrease with clinical improvement.

Our experience demonstrates a very good correlation between DSG1 and DSG3 results and the presence of pemphigus. Adequate sensitivities and specificity for disease are documented. However, in those patients strongly suspected to have pemphigus either by clinical findings or by routine biopsy, and in whom the DSG assay is negative, the IIF test (CIFS/8052 Cutaneous Immunofluorescence Antibodies [IgG], Serum) is recommended.

**ADMINISTRATIVE**

CPT Codes:
83516-90 x2

**COMPLETE VIEW**

Available Stat:
No
Test Code:
DSG
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
ELISA
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Rejection Criteria:
Gross hemolysis, lipemia or icterus
Specimen Preparation:
Spin and freeze aliquot at -20C. Ship to China Basin.
Units:
U
Reference Interval:

<table>
<thead>
<tr>
<th>DESMOGLEIN 1</th>
<th>DESMOGLEIN 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative: &lt;14.0 U</td>
<td>Negative: &lt;9.0 U</td>
</tr>
<tr>
<td>Indeterminate: 14.0-20.0 U</td>
<td>Indeterminate: 9.0-20.0 U</td>
</tr>
<tr>
<td>Positive: &gt;20.0 U</td>
<td></td>
</tr>
</tbody>
</table>
Positive: >20.0 U

**Synonyms:**
- DSG1 Ab
- DSG1 Antibody
- DSG3 Ab
- DSG3 Antibody

**Stability (from collection to initiation):**
- Room temperature 1.5 days, refrigerated 1 week, frozen 2 weeks

**Reported:**
- 7-9 days

**Additional Information:**

Pemphigus includes a group of often fatal autoimmune, blistering diseases characterized by intraepithelial lesions. Pemphigus vulgaris and its variants may present with oral or mucosal lesions alone or with mucosal plus skin lesions. Pemphigus foliaceus and variants present with skin lesions alone.

Indirect immunofluorescence (IIF) studies reveal that both forms of pemphigus are caused by autoantibodies to cell surface antigens of stratified epithelia or mucous membranes and skin. These antibodies bind to calcium-dependent adhesion molecules in cell surface desmosomes, notably desmoglein 1 (DSG1) in pemphigus foliaceus and desmoglein 3 (DSG3) and/or DSG1 in pemphigus vulgaris. Desmogleins are protein substances located in and on the surface of keratinocytes. These proteins have been shown to be a critical factor in cell-to-cell adhesion. Antibodies to desmogleins can result in loss of cell adhesion, the primary cause of blister formation in pemphigus.

The diagnosis of pemphigus depends on biopsy and serum studies that characterize lesions and detect the autoantibodies that cause them. Originally, the serum studies were performed by IIF using monkey esophagus and other tissue substrates. The identification of the reactive antigens as DSG1 and DSG3 has made it possible to develop highly specific and sensitive enzyme-linked immunosorbent assay (ELISA) methods.

Antibodies to desmoglein 1 (DSG1) and desmoglein 3 (DSG3) have been shown to be present in patients with pemphigus. Many patients with pemphigus foliaceus, a superficial form of pemphigus have antibodies to DSG1. Patients with pemphigus vulgaris, a deeper form of pemphigus, have antibodies to DSG3 and sometimes DSG1 as well.

Antibody titer correlates in a semiquantitative manner with disease activity in many patients. Patients with severe disease can usually be expected to have high titers of antibodies to DSG. Titers are expected to decrease with clinical improvement.

Our experience demonstrates a very good correlation between DSG1 and DSG3 results and the presence of pemphigus. Adequate sensitivities and specificity for disease are documented. However, in those patients strongly suspected to have pemphigus either by clinical findings or by routine biopsy, and in whom the DSG assay is negative, the IIF test (CIFS/8052 Cutaneous Immunofluorescence Antibodies [IgG], Serum) is recommended.

**CPT Codes:**

83516-90 x2
Dexamethasone Suppression Test

ORDERING

Available Stat:
No
Additional Information:
For Depressive Illness based on Carrollet al. Arch Gen Psych 1981;38:15.

1 mg dexamethasone is given at 2300 on day 1, and serum cortisol levels are obtained 18 and 24 hours later (1600 and 2300 on day 2). A cortisol level of > 4 µg/dL (> 110 nmol/L) in either day 2 specimen is considered abnormal.

Indomethacin and similar drugs may give false-negative results, and the diagnostic value of this test is in any case dubious.

COLLECTION

Sample Type:
see Cortisol

PROCESSING

Test Group:
Dexamethasone Suppression Test

RESULT INTERPRETATION

Reference Interval:
See Additional Information
Additional Information:
For Depressive Illness based on Carrollet al. Arch Gen Psych 1981;38:15.

1 mg dexamethasone is given at 2300 on day 1, and serum cortisol levels are obtained 18 and 24 hours later (1600 and 2300 on day 2). A cortisol level of > 4 µg/dL (> 110 nmol/L) in either day 2 specimen is considered abnormal.

Indomethacin and similar drugs may give false-negative results, and the diagnostic value of this test is in any case dubious.

COMPLETE VIEW

Available Stat:
No
Test Group:
Dexamethasone Suppression Test
Sample Type:
see Cortisol
Reference Interval:
See Additional Information
Additional Information:
For Depressive Illness based on Carrollet al. Arch Gen Psych 1981;38:15.

1 mg dexamethasone is given at 2300 on day 1, and serum cortisol levels are obtained 18 and 24 hours later (1600 and 2300 on day 2). A cortisol level of > 4 µg/dL (> 110 nmol/L) in either day 2 specimen is considered abnormal.

Indomethacin and similar drugs may give false-negative results, and the diagnostic value of this test is in any case dubious.
Dexamethasone Suppression Test, High-Dose

ORDERING

Available Stat:
No
Additional Information:

For Differential Diagnosis of Cushing’s Syndrome.

Rapid Test (based on Tyrrell JB et al. Ann Intern Med 1986;104:180.: Obtain a baseline serum cortisol at 0700-0800 hours. Administer 8.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning. Interpretation: A positive response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to <=50% of the baseline cortisol level (sensitivity 89%, CI 80-94%; specificity 100%, CI 84-100%).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 2.0 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHS collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose. Interpretation: A positive response (suppressibility) is a reduction in both assays to <=50% of baseline values (sensitivity 92%, CI 82-97%; specificity 94%, CI 85-97%).

Significance: A positive response generally indicates an ACTH-producing pituitary tumor, rather than an ectopic (primarily thoracic) ACTH-producing tumor or an adrenal source.

COLLECTION

Sample Type:
see Cortisol

PROCESSING

Test Group:
Dexamethasone Suppression Test

RESULT INTERPRETATION

Reference Interval:
See Additional Information
Additional Information:

For Differential Diagnosis of Cushing’s Syndrome.

Rapid Test (based on Tyrrell JB et al. Ann Intern Med 1986;104:180.: Obtain a baseline serum cortisol at 0700-0800 hours. Administer 8.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning. Interpretation: A positive response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to <=50% of the baseline cortisol level (sensitivity 89%, CI 80-94%; specificity 100%, CI 84-100%).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 2.0 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHS collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose. Interpretation: A positive response (suppressibility) is a reduction in both assays to <=50% of baseline values (sensitivity 92%, CI 82-97%; specificity 94%, CI 85-97%).

Significance: A positive response generally indicates an ACTH-producing pituitary tumor, rather than an ectopic (primarily thoracic) ACTH-producing tumor or an adrenal source.
Available Stat:  
   No

Test Group:  
   Dexamethasone Suppression Test

Sample Type:  
   see Cortisol

Reference Interval:  
   See Additional Information

Additional Information:

For Differential Diagnosis of Cushing's Syndrome.

Rapid Test (based on Tyrrell JB et al. Ann Intern Med 1986;104:180.; Obtain a baseline serum cortisol at 0700-0800 hours. Administer 8.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning. Interpretation: A positive response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to <=50% of the baseline cortisol level (sensitivity 89%, CI 80-94%; specificity 100%, CI 84-100%).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 2.0 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHS collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose. Interpretation: A positive response (suppressibility) is a reduction in both assays to <=50% of baseline values (sensitivity 92%, CI 82-97%; specificity 94%, CI 85-97%).

Significance: A positive response generally indicates an ACTH-producing pituitary tumor, rather than an ectopic (primarily thoracic) ACTH-producing tumor or an adrenal source.
Dexamethasone Suppression Test, Low-Dose

ORDERING

Available Stat: No

Additional Information:

For Diagnosis of Cushing's Syndrome.

Rapid Test (based on Pavlatos FC et al. JAMA 1965;193:720): Obtain a baseline serum cortisol at 0700-0800 hours. Administer 1.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning.
Interpretation: A normal response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to < 5 µg/dL (< 140 nmol/L).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 0.5 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHC collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose.
Interpretation: A normal response (suppressibility) is a reduction in cortisol to < 5 µg/dL (< 140 nmol/L) and of 17-OHC to < 4 mg/d (< 11 µmol/d).

Significance: An (abnormal) lack of suppression typifies Cushing's Syndrome.

COLLECTION

Sample Type: see Cortisol

PROCESSING

Test Group: Dexamethasone Suppression Test

RESULT INTERPRETATION

Reference Interval:
See Additional Information

Additional Information:

For Diagnosis of Cushing's Syndrome.

Rapid Test (based on Pavlatos FC et al. JAMA 1965;193:720): Obtain a baseline serum cortisol at 0700-0800 hours. Administer 1.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning.
Interpretation: A normal response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to < 5 µg/dL (< 140 nmol/L).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 0.5 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHC collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose.
Interpretation: A normal response (suppressibility) is a reduction in cortisol to < 5 µg/dL (< 140 nmol/L) and of 17-OHC to < 4 mg/d (< 11 µmol/d).

Significance: An (abnormal) lack of suppression typifies Cushing's Syndrome.
Available Stat:
No

Test Group:
Dexamethasone Suppression Test

Sample Type:
see Cortisol

Reference Interval:
See Additional Information

Additional Information:

For Diagnosis of Cushing's Syndrome.

Rapid Test (based on Pavlatos FC et al. JAMA 1965;193:720): Obtain a baseline serum cortisol at 0700-0800 hours. Administer 1.0 mg po dexamethasone that evening at 2300 hours and obtain another serum cortisol at 0700-0800 hours the following morning.
Interpretation: A normal response (suppressibility) is a reduction of the post-dexamethasone serum cortisol to < 5 µg/dL (< 140 nmol/L).

Standard Test (based on Liddle GW. J Clin Endocrinol Metab 1960;20:1539): Obtain a baseline serum cortisol at 0700-0800 hours and a 24 hour urine collection of urine for 17-OH corticosteroids beginning at the same time. On the following day administer 0.5 mg po dexamethasone q6h for 8 doses. Repeat the 24 hour urine 17-OHC collection during day 2 of dexamethasone administration and repeat the plasma cortisol at 0700-0800 hours on the morning after the last steroid dose.
Interpretation: A normal response (suppressibility) is a reduction in cortisol to < 5 µg/dL (< 140 nmol/L) and of 17-OHC to < 4 mg/d (< 11 µmol/d).

Significance: An (abnormal) lack of suppression typifies Cushing's Syndrome.
**Diazepam**

**MOLT**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- HPLC

**Reported:**
- Test performed Monday, Wednesday, Friday. Turnaround time: 2-4 days.

**Additional Information:**
- Includes nordiazepam and oxazepam. Potentially toxic: > 2.5.

**Synonyms:**
- Valium
- nordiazepam
- oxazepam
- Desmethyldiazepam

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top (Gold top **NOT** acceptable)

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Remarks:**
- Do NOT use a serum separator tube.

**Unacceptable Conditions:**
- Collected in Gold top

### PROCESSING

**Test Code:**
- MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Refrigerate. Order Quest # 94130

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Unacceptable Conditions:**
RESULT INTERPRETATION

Units:
- mg/L

Reference Interval:
- Therapeutic: 0.1-2.5 mg/L for the SUM of the parent drug and its metabolite

Critical Values:
- Quest Priority-1: Diazepam + Norazepam >= 3.0 mg/L

Additional Information:
- Includes nordiazepam and oxazepam. Potentially toxic: > 2.5.

ADMINISTRATIVE

CPT Codes:
- 80154-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- HPLC

Remarks:
- Do NOT use a serum separator tube.

Collect:
- Red top (Gold top NOT acceptable)

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum

Preferred Volume:
- 2 mL serum

Minimum Volume:
- 1 mL serum

Unacceptable Conditions:
- Collected in Gold top

Specimen Preparation:
- Refrigerate. Order Quest # 94130

Units:
- mg/L

Reference Interval:
- Therapeutic: 0.1-2.5 mg/L for the SUM of the parent drug and its metabolite

Critical Values:
- Quest Priority-1: Diazepam + Norazepam >= 3.0 mg/L

Synonyms:
- Valium
• nordazepam
• oxazepam
• Desmethyldiazepam

**Reported:**
Test performed Monday, Wednesday, Friday. Turnaround time: 2-4 days.

**Additional Information:**
Includes nordiazepam and oxazepam. Potentially toxic: > 2.5.

**CPT Codes:**
80154-90
Differential Time to Positivity
P060 & P061

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Daily, all shifts
Methodology:
Culture
Reported:
6 days
Additional Information:
If organisms grow in the sample drawn through the line at least two hours earlier than from the peripheral blood, then the line is considered to be the source of infection.

Synonyms:
• catheter tip
• catheter infection
• blood culture

COLLECTION

Sample Type:
Whole blood
Collect:
Two sets of paired blood culture bottles (BD BACTEC Plus Aerobic and Lytic Anaerobic)
Amount to Collect:

Adults: 40 mL total (20 mL for each set / 10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight for EACH set:
< 1 kg = 1 mL for aerobic only (0.5 ml for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Preferred Volume:
Adults: 40 mL total (20 mL for each set / 10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight for EACH set (see "Amount to Collect" above)

Minimum Volume:
Adults: 20 mL total (10 mL for each set / 5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Remarks:

For detailed instructions, see nursing manual.

Peripheral vein and CVC line samples must be obtained within 15 minutes of each other.

The volumes of blood obtained from the peripheral vein & from the CVC must match. (e.g. if only 12 mLs is obtained from peripheral...
stick, obtain only 12 mLs from CVC).

Draw peripheral blood sample first since the amount of blood obtained will determine how much is obtained from the CVC.

Inoculate one set of aerobic & anaerobic bottles with the peripheral sample, dividing the volume in half for each bottle. Label bottles as "peripheral" and submit with a microbiology requisition (if applicable) for a DTTP Peripheral Blood Culture.

Inoculate a second set of aerobic & anaerobic bottles with the line sample, dividing the volume in half for each bottle. Label bottles as "line" and submit with a microbiology requisition (if applicable) for a DTTP Central Blood Culture.

Put all 4 bottles and requisitions (if applicable) in the same specimen bag and send to the lab.

**Stability (from collection to initiation):**
- 36 hours at room temperature

**Unacceptable Conditions:**
- Samples that are not collected per "Collection Instructions"

### PROCESSING

**Test Code:**
- P060 & P061

**Test Group:**
- Bacterial culture

**Performing Lab:**
- Microbiology

**Specimen Preparation:**

1. Maintain samples at room temperature.
2. Both peripheral and central blood cultures, collected within 15 minutes of each other are submitted. More than one type of central blood culture may be submitted. Each set should be labeled as peripheral or central. Physician will order DTTP Peripheral Blood Culture and DTTP Central Blood Culture.
3. If unsuitable collection, complete a credit form and indicate reason NOTTP (DTTP culture not performed due to improper collection. Test requires peripheral and central line blood draws, collected within 15 minutes of each other.)
4. Accession one set and then the other(s).
5. Send all bottles to China Basin in one bag.
6. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.
7. Load all bottles into the instrument at the same time.

See Peripheral and Central Blood Culture processing notes for more information.

**Preferred Volume:**
- Adults: 40 mL total (20 mL for each set / 10 mL for each bottle)
- Pediatrics: Collect blood sample amount according to weight for EACH set (see "Amount to Collect" above)

**Minimum Volume:**
- Adults: 20 mL total (10 mL for each set / 5 mL for each bottle)
- Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

**Unacceptable Conditions:**
- Samples that are not collected per "Collection Instructions"

**Stability (from collection to initiation):**
- 36 hours at room temperature

### RESULT INTERPRETATION

**Reference Interval:**
No growth

**Critical Values:**

Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned.

Additional calls only made if > 7 days have elapsed since first call or a different organism is identified.

**Additional Information:**

If organisms grow in the sample drawn through the line at least two hours earlier than from the peripheral blood, then the line is considered to be the source of infection.

**ADMINISTRATIVE**

**CPT Codes:**

- 87040

**LOINC Codes:**

- 600-7

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- P060 & P061

**Test Group:**

- Bacterial culture

**Performing Lab:**

- Microbiology

**Performed:**

- Daily, all shifts

**Methodology:**

- Culture

**Remarks:**

For detailed instructions, see nursing manual.

Peripheral vein and CVC line samples must be obtained within 15 minutes of each other.

The volumes of blood obtained from the peripheral vein & from the CVC must match. (e.g. if only 12 mLs is obtained from peripheral stick, obtain only 12 mLs from CVC).

Draw peripheral blood sample first since the amount of blood obtained will determine how much is obtained from the CVC.

Inoculate one set of aerobic & anaerobic bottles with the peripheral sample, dividing the volume in half for each bottle. Label bottles as "peripheral" and submit with a microbiology requisition (if applicable) for a DTTP Peripheral Blood Culture.

Inoculate a second set of aerobic & anaerobic bottles with the line sample, dividing the volume in half for each bottle. Label bottles as "line" and submit with a microbiology requisition (if applicable) for a DTTP Central Blood Culture.

Put all 4 bottles and requisitions (if applicable) in the same specimen bag and send to the lab.

**Collect:**

- Two sets of paired blood culture bottles (BD BACTEC Plus Aerobic and Lytic Anaerobic)

**Amount to Collect:**

**Adults:** 40 mL total (20 mL for each set / 10 mL for each bottle)

**Pediatrics:** Collect blood sample amount according to weight for EACH set:

- < 1 kg = 1 mL for aerobic only (0.5 ml for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Sample Type:
Whole blood

Preferred Volume:
Adults: 40 mL total (20 mL for each set / 10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight for EACH set (see "Amount to Collect" above)

Minimum Volume:
Adults: 20 mL total (10 mL for each set / 5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Unacceptable Conditions:
Samples that are not collected per “Collection Instructions”

Specimen Preparation:

1. Maintain samples at room temperature.
2. Both peripheral and central blood cultures, collected within 15 minutes of each other are submitted. More than one type of central blood culture may be submitted. Each set should be labeled as peripheral or central. Physician will order DTTP Peripheral Blood Culture and DTTP Central Blood Culture.
3. If unsuitable collection, complete a credit form and indicate reason NOTTP (DTTP culture not performed due to improper collection. Test requires peripheral and central line blood draws, collected within 15 minutes of each other.)
4. Accession one set and then the other(s).
5. Send all bottles to China Basin in one bag.
6. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.
7. Load all bottles into the instrument at the same time.

See Peripheral and Central Blood Culture processing notes for more information.

Reference Interval:
No growth

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned.

Additional calls only made if > 7 days have elapsed since first call or a different organism is identified.

Synonyms:
- catheter tip
- catheter infection
- blood culture

Stability (from collection to initiation):
36 hours at room temperature

Reported:
6 days

Additional Information:
If organisms grow in the sample drawn through the line at least two hours earlier than from the peripheral blood, then the line is considered to be the source of infection.

CPT Codes:
87040

LOINC Codes:
600-7
# Digitoxin

**DIGT**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Immunoasssay</td>
</tr>
<tr>
<td>Reported:</td>
<td>Test run daily. Turnaround time: 2-3 days.</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>Potentially toxic: &gt; 30 µg/L.</td>
</tr>
</tbody>
</table>

## COLLECTION

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Serum or EDTA plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect:</td>
<td>Red top, Lavender top (Gold top <strong>NOT</strong> acceptable)</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>2 mL blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL serum or plasma</td>
</tr>
<tr>
<td>Remarks:</td>
<td>Draw at least 6-12 hours after administration.</td>
</tr>
<tr>
<td>Unacceptable Conditions:</td>
<td>Collected in Gold top</td>
</tr>
</tbody>
</table>

## PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>DIGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Order Quest #417Z.</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL serum or plasma</td>
</tr>
<tr>
<td>Unacceptable Conditions:</td>
<td>Collected in Gold top</td>
</tr>
</tbody>
</table>

## RESULT INTERPRETATION

<table>
<thead>
<tr>
<th>Units:</th>
<th>ng/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Interval:</td>
<td>Therapeutic: 10-30 ng/mL</td>
</tr>
<tr>
<td></td>
<td>Potentially toxic: &gt; 30 ng/mL</td>
</tr>
</tbody>
</table>
Critical Values:
  Quest Priority-1: >= 45 ng/mL

Additional Information:
  Potentially toxic: > 30 µg/L.

ADMINISTRATIVE

CPT Codes:
  80299-90

LOINC Codes:
  3559-2

COMPLETE VIEW

Available Stat:
  No

Test Code:
  DIGT

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Immunoassay

Remarks:
  Draw at least 6-12 hours after administration.

Collect:
  Red top, Lavender top (Gold top NOT acceptable)

Amount to Collect:
  2 mL blood

Sample Type:
  Serum or EDTA plasma

Preferred Volume:
  1 mL serum or plasma

Unacceptable Conditions:
  Collected in Gold top

Specimen Preparation:
  Order Quest #417Z.

Units:
  ng/mL

Reference Interval:
  Therapeutic: 10-30 ng/mL
  Potentially toxic: > 30 ng/mL

Critical Values:
  Quest Priority-1: >= 45 ng/mL

Reported:
  Test run daily. Turnaround time: 2-3 days.

Additional Information:
  Potentially toxic: > 30 µg/L.

CPT Codes:
  80299-90

LOINC Codes:
  3559-2
**Digoxin**

**DIG**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Turbidimetric Inhibition immunoassay

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Non-specific immunologic CROSS-REACTIVITY can occur in patients with renal failure, pregnant women and neonates.

**Note:** In patients receiving Digibind therapy for treatment of digoxin overdose, the measured levels of digoxin are unreliable and may accurately reflect neither the total level of digoxin (bound and free) nor the level of free digoxin.

Although offered Stat, therapeutic decisions are typically not altered by stat results except in cases of accidental massive overdose when Digibind therapy is contemplated. Due to the long T1/2 for Digoxin it is generally acceptable to merely hold the next dose and obtain a routine Digoxin level.

See the lab manual’s "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**Synonyms:**
- Lanoxin

### COLLECTION

**Sample Type:**
Serum or plasma

**Collect:**
Gold top or Light Green top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.3 mL serum or plasma

**Remarks:**
Time to steady state: 3-5 days
Collect samples 30 minutes before next dose or at least 6-8 hours post dose.

### PROCESSING

**Test Code:**
DIG

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Specimen Preparation:**
Refrigerate serum.

**Preferred Volume:**
0.5 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

RESULT INTERPRETATION

Units:
µg/L

Reference Interval:
Therapeutic: 0.5-2.0 µg/L

Critical Values:
>2.0 µg/L

Additional Information:
Non-specific immunologic CROSS-REACTIVITY can occur in patients with renal failure, pregnant women and neonates.

Note: In patients receiving Digibind therapy for treatment of digoxin overdose, the measured levels of digoxin are unreliable and may accurately reflect neither the total level of digoxin (bound and free) nor the level of free digoxin.

Although offered Stat, therapeutic decisions are typically not altered by stat results except in cases of accidental massive overdose when Digibind therapy is contemplated. Due to the long T1/2 for Digoxin it is generally acceptable to merely hold the next dose and obtain a routine Digoxin level.

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80162
LOINC Codes:
10535-3

COMPLETE VIEW

Available Stat:
Yes

Test Code:
DIG

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Turbidimetric Inhibition immunoassay

Remarks:
Time to steady state: 3-5 days

Collect samples 30 minutes before next dose or at least 6-8 hours post dose.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.3 mL serum or plasma

**Specimen Preparation:**
Refrigerate serum.

**Units:**
µg/L

**Reference Interval:**
Therapeutic: 0.5-2.0 µg/L

**Critical Values:**
>2.0 µg/L

**Synonyms:**
- Lanoxin

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Non-specific immunologic CROSS-REACTIVITY can occur in patients with renal failure, pregnant women and neonates.

**Note:** In patients receiving Digibind therapy for treatment of digoxin overdose, the measured levels of digoxin are unreliable and may accurately reflect neither the total level of digoxin (bound and free) nor the level of free digoxin.

Although offered Stat, therapeutic decisions are typically not altered by stat results except in cases of accidental massive overdose when Digibind therapy is contemplated. Due to the long T1/2 for Digoxin it is generally acceptable to merely hold the next dose and obtain a routine Digoxin level.

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**CPT Codes:**
- 80162

**LOINC Codes:**
- 10535-3
Dihydrotestosterone
DHT

ORDERING

Available Stat:
No
Performing Lab:
ESCI
Reported:
Test run Tuesday-Saturday. Turnaround time: 2-4 days.
Synonyms:
• DHT

COLLECTION

Sample Type:
Serum or EDTA plasma
Collect:
Gold top (Lavender ok)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Remarks:
Bring immediately to lab for processing
Unacceptable Conditions:
Delivered to lab > 30 min after collection

PROCESSING

Test Code:
DHT
Sendout:
Yes
Performing Lab:
ESCI
Specimen Preparation:
Separate serum or plasma within one hour of collection and freeze at -20C.
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Unacceptable Conditions:
Delivered to lab > 30 min after collection

RESULT INTERPRETATION

Units:
ng/dL
Reference Interval:
Printed 06/07/19
Test information subject to change
### Age Male Female

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord Blood</td>
<td>&lt;2-8 ng/dL</td>
<td>&lt;2-8 ng/dL</td>
</tr>
<tr>
<td>Premature Infants</td>
<td>10-53 ng/dL</td>
<td>2-13 ng/dL</td>
</tr>
<tr>
<td>Full-term Newborns</td>
<td>5-60 ng/dL</td>
<td>&lt;2-15 ng/dL</td>
</tr>
<tr>
<td>30-60 days</td>
<td>12-85 ng/dL</td>
<td>&lt;3 ng/dL</td>
</tr>
<tr>
<td>7 months -Tanner Stage 1</td>
<td>&lt;3 ng/dL</td>
<td>&lt;3 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage 2</td>
<td>3-17 ng/dL</td>
<td>5-12 ng/dL</td>
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<tr>
<td>Tanner Stage 3</td>
<td>8-33 ng/dL</td>
<td>7-19 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage 4</td>
<td>22-52 ng/dL</td>
<td>4-13 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage 5</td>
<td>24-65 ng/dL</td>
<td>3-18 ng/dL</td>
</tr>
<tr>
<td>&gt;= 18 year old</td>
<td>30-85 ng/dL</td>
<td>4-22 ng/dL</td>
</tr>
</tbody>
</table>

### ADMINISTRATIVE

**CPT Codes:**
- 80327-90

**LOINC Codes:**
- 1848-1

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- DHT

**Performing Lab:**
- ESCI

**Sendout:**
- Yes

**Remarks:**
- Bring immediately to lab for processing

**Collect:**
- Gold top (Lavender ok)

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum or EDTA plasma

**Preferred Volume:**
- 1 mL serum or plasma

**Minimum Volume:**
- 0.5 mL serum or plasma

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

**Specimen Preparation:**
- Separate serum or plasma within one hour of collection and freeze at -20°C.

**Units:**
- ng/dL

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord Blood</td>
<td>&lt;2-8 ng/dL</td>
<td>&lt;2-8 ng/dL</td>
</tr>
<tr>
<td>Premature Infants</td>
<td>10-53 ng/dL</td>
<td>2-13 ng/dL</td>
</tr>
<tr>
<td>Full-term Newborns</td>
<td>5-60 ng/dL</td>
<td>&lt;2-15 ng/dL</td>
</tr>
<tr>
<td>30-60 days</td>
<td>12-85 ng/dL</td>
<td>&lt;3 ng/dL</td>
</tr>
<tr>
<td>7 months -Tanner Stage 1</td>
<td>&lt;3 ng/dL</td>
<td>&lt;3 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage 2</td>
<td>3-17 ng/dL</td>
<td>5-12 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage 3</td>
<td>8-33 ng/dL</td>
<td>7-19 ng/dL</td>
</tr>
</tbody>
</table>
Tanner Stage 4  22-52 ng/dL  4-13 ng/dL
Tanner Stage 5  24-65 ng/dL  3-18 ng/dL
>= 18 year old  30-85 ng/dL  4-22 ng/dL

Synonyms:
  • DHT

Reported:
  Test run Tuesday-Saturday. Turnaround time: 2-4 days.

CPT Codes:
  80327-90

LOINC Codes:
  1848-1
# Diphtheria Antitoxin

**DIPH**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Enzyme Immunoassay

**Reported:**
- Set up 3x per week. Turnaround time 1-5 days

**Additional Information:**
- Following immunization, levels usually increase > 4-fold.

**Synonyms:**
- Diphtheria antitoxoid Ab

## COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Remarks:**
- Label samples as "PRE" or "POST".

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.

## PROCESSING

**Test Code:**
- DIPH

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Label samples as "PRE" or "POST". Freeze serum at -20°C. Order Quest # 4865

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.

## RESULT INTERPRETATION
Units:
IU/mL
Reference Interval:
Protective: >= 0.01 IU/mL
Additional Information:
Following immunization, levels usually increase > 4-fold.

ADMINISTRATIVE

CPT Codes:
86648-90
LOINC Codes:
13227-4

COMPLETE VIEW

Available Stat:
No
Test Code:
DIPH
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzyme Immunoassay
Remarks:
Label samples as "PRE" or "POST".
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Label samples as "PRE" or "POST". Freeze serum at -20C. Order Quest # 4865
Units:
IU/mL
Reference Interval:
Protective: >= 0.01 IU/mL
Synonyms:
- Diphtheria antitoxoid Ab
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month.
Reported:
Set up 3x per week. Turnaround time 1-5 days
Additional Information:
Following immunization, levels usually increase > 4-fold.
CPT Codes:
86648-90
LOINC Codes:
13227-4
Diphtheria Culture
P126

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts.
Methodology:
Selective media
Additional Information:
Diphtheria species culture is NOT part of routine throat or wound cultures, it must be specifically requested. For non-NP or throat specimens an aerobic wound culture is routinely added to the Diphtheria specific culture.
Synonyms:
- Bacterial culture

COLLECTION

Sample Type:
Throat, skin or wound swab
Collect:
Swab in transport media
Remarks:
Please alert Microbiology, x3-1268.
Stability (from collection to initiation):
Room temperature 12 hours
Unacceptable Conditions:
Swabs not received in transport media.

PROCESSING

Test Code:
P126
Performing Lab:
Microbiology
Unacceptable Conditions:
Swabs not received in transport media.
Stability (from collection to initiation):
Room temperature 12 hours

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Diphtheria species culture is NOT part of routine throat or wound cultures, it must be specifically requested. For non-NP or throat specimens an aerobic wound culture is routinely added to the Diphtheria specific culture.

ADMINISTRATIVE

CPT Codes:
Available Stat:
No
Test Code:
P126
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts.
Methodology:
Selective media
Remarks:
Please alert Microbiology, x3-1268.
Collect:
Swab in transport media
Sample Type:
Throat, skin or wound swab
Unacceptable Conditions:
Swabs not received in transport media.
Reference Interval:
Negative
Synonyms:
• Bacterial culture
Stability (from collection to initiation):
Room temperature 12 hours
Additional Information:
Diphtheria species culture is NOT part of routine throat or wound cultures, it must be specifically requested. For non-NP or throat specimens an aerobic wound culture is routinely added to the Diphtheria specific culture.
CPT Codes:
87081 x 2
LOINC Codes:
567-8
Disaccharidases
DSCS

ORDERING

Available Stat:  No
Performing Lab:  Quest
Methodology:  Spectrometry

Additional Information:
Lactase, maltase, palatinase and sucrase are mucosal disaccharidases that are present in normal small intestine and fetal colon. A decrease in the enzyme activity of these disaccharidases has been noted in colonic adenomas, adenocarcinomas and malabsorption. Decreased disaccharidase activity is a good indication of mucosal injury with the exception of lactase.

Synonyms:
- Lactase deficiency
- Palatinase deficiency
- Sucrase deficiency
- Maltase deficiency

COLLECTION

Sample Type:  Small bowel biopsy
Collect:  Small bowel biopsy
Amount to Collect:  5 mg
Preferred Volume:  5 mg
Minimum Volume:  2 mg
Remarks:
Do not place tissue on gauze or filter paper; do not add saline or allow contact with support, preservatives or embedding material. Transport immediately to laboratory.

Unacceptable Conditions:
Sample submitted improperly. Delivered to laboratory > 30 minutes after collection

PROCESSING

Test Code:  DSCS
Sendout:  Yes
Performing Lab:  Quest
Specimen Preparation:  Specimen must be kept frozen and stored at -70C. Do not thaw. Deliver to China Basin on dry ice.
Preferred Volume:  5 mg
Minimum Volume:  2 mg
Unacceptable Conditions:
Sample submitted improperly. Delivered to laboratory > 30 minutes after collection

RESULT INTERPRETATION

Units:
µM glucose generated/min/ g protein

Reference Interval:
- Lactase: 15.0-45.5 µM gluc/min/g prot
- Maltase: 25-69.9 µM gluc/min/g prot
- Palatinase: 100-224.4 µM gluc/min/g prot
- Sucrase: 5-26.3 µM gluc/min/g prot

Additional Information:
Lactase, maltase, palatinase and sucrase are mucosal disaccharidases that are present in normal small intestine and fetal colon. A decrease in the enzyme activity of these disaccharidases has been noted in colonic adenomas, adenocarcinomas and malabsorption. Decreased disaccharidase activity is a good indication of mucosal injury with the exception of lactase.

ADMINISTRATIVE

CPT Codes:
84311-90 x4

LOINC Codes:
1942-2

COMPLETE VIEW

Available Stat:
No

Test Code:
DSCS

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Spectrometry

Remarks:
Do not place tissue on gauze or filter paper; do not add saline or allow contact with support, preservatives or embedding material. Transport immediately to laboratory.

Collect:
Small bowel biopsy

Amount to Collect:
5 mg

Sample Type:
Small bowel biopsy

Preferred Volume:
5 mg

Minimum Volume:
2 mg

Unacceptable Conditions:
Sample submitted improperly. Delivered to laboratory > 30 minutes after collection

Specimen Preparation:
Specimen must be kept frozen and stored at -70C. Do not thaw. Deliver to China Basin on dry ice.

Units:
µM glucose generated/min/ g protein
Reference Interval:
- Lactase: 15.0-45.5 µM gluc/min/g prot
- Maltase: 25-69.9 µM gluc/min/g prot
- Palatinase: 100-224.4 µM gluc/min/g prot
- Sucrase: 5-26.3 µM gluc/min/g prot

Synonyms:
- Lactase deficiency
- Palatinase deficiency
- Sucrase deficiency
- Maltase deficiency

Additional Information:
Lactase, maltase, palatinase and sucrase are mucosal disaccharidases that are present in normal small intestine and fetal colon. A decrease in the enzyme activity of these disaccharidases has been noted in colonic adenomas, adenocarcinomas and malabsorption. Decreased disaccharidase activity is a good indication of mucosal injury with the exception of lactase.

CPT Codes:
- 84311-90 x4

LOINC Codes:
- 1942-2
Disopyramide
DISO

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: FPIA
Reported: Test performed Monday-Saturday. Turnaround time: 1-3 days.
Additional Information: Potentially toxic: > 8 mg/L.
Synonyms: • Norpace

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum

PROCESSING

Test Code: DISO
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate serum. Order Quest # 35766P.
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum

RESULT INTERPRETATION

Units: mg/L
Reference Interval: Therapeutic: 2-5 mg/L
Critical Values:
Quest Priority-1: >= 7.0 mg/L

Additional Information:
Potentially toxic: > 8 mg/L.

**ADMINISTRATIVE**

CPT Codes:
- 80299-90

LOINC Codes:
- 3576-6

**COMPLETE VIEW**

Available Stat:
No

Test Code:
DISO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
FPIA

Collect:
Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Refrigerate serum. Order Quest # 35766P.

Units:
mg/L

Reference Interval:
Therapeutic: 2-5 mg/L

Critical Values:
Quest Priority-1: >= 7.0 mg/L

Synonyms:
- Norpace

Reported:
Test performed Monday-Saturday. Turnaround time: 1-3 days.

Additional Information:
Potentially toxic: > 8 mg/L.

CPT Codes:
- 80299-90

LOINC Codes:
- 3576-6
# Diuretic Screen and Identification

## DIUS

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Mayo

**Methodology:**
- HPLC

**Additional Information:**
- Qualitative test for thiazides, furosemide, and ethacrylic acid; an attempt will be made to identify the individual thiazide.

### COLLECTION

**Sample Type:**
- Random Urine

**Collect:**
- Urine cup

**Amount to Collect:**
- 20 mL urine

**Preferred Volume:**
- 20 mL urine

**Minimum Volume:**
- 10 mL urine

### PROCESSING

**Test Code:**
- DIUS

**Sendout:**
- Yes

**Performing Lab:**
- Mayo

**Specimen Preparation:**
- Refrigerate. Order MAYO# 8246 Call MCS for pickup.

**Preferred Volume:**
- 20 mL urine

**Minimum Volume:**
- 10 mL urine

### RESULT INTERPRETATION

**Additional Information:**
- Qualitative test for thiazides, furosemide, and ethacrylic acid; an attempt will be made to identify the individual thiazide.

### ADMINISTRATIVE

**CPT Codes:**
- 80101-90

**LOINC Codes:**
- 12286-1
Available Stat: No
Test Code: DIUS
Performing Lab: Mayo
Sendout: Yes
Methodology: HPLC
Collect: Urine cup
Amount to Collect: 20 mL urine
Sample Type: Random Urine
Preferred Volume: 20 mL urine
Minimum Volume: 10 mL urine
Specimen Preparation: Refrigerate. Order MAYO# 8246 Call MCS for pickup.
Additional Information: Qualitative test for thiazides, furosemide, and ethacrynic acid; an attempt will be made to identify the individual thiazide.
CPT Codes: 80101-90
LOINC Codes: 12286-1
# DNA Extraction and Hold

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Performed:**
- Run daily, Monday through Friday, day shift only

**Methodology:**
- DNA Extraction

**Additional Information:**
- Samples will be held for 30 days. If no testing is ordered within that time frame, the sample will be discarded. For questions, contact the molecular diagnostics laboratory at 514-8488.

### COLLECTION

**Sample Type:**
- Whole blood

**Collect:**
- Lavender top preferred, Yellow top (ACD) or Blue top (citrate) acceptable

**Amount to Collect:**
- 3 mL blood

**Preferred Volume:**
- 2 mL blood

**Minimum Volume:**
- 1 mL blood

**Remarks:**
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Unacceptable Conditions:**
- Unlabeled, QNS, clotted samples. Samples collected in heparin

### PROCESSING

**Test Code:**
- DNAX

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Preferred Volume:**
- 2 mL blood

**Minimum Volume:**
- 1 mL blood

**Unacceptable Conditions:**
- Unlabeled, QNS, clotted samples. Samples collected in heparin

### RESULT INTERPRETATION

**Additional Information:**
- Samples will be held for 30 days. If no testing is ordered within that time frame, the sample will be discarded. For questions, contact the molecular diagnostics laboratory at 514-8488.
CPT Codes:
81479

**COMPLETE VIEW**

Available Stat:
No

**Test Code:**
DNAX

**Performing Lab:**
Medical Genomics - Molecular Diagnostics

**Performed:**
Run daily, Monday through Friday, day shift only

**Methodology:**
DNA Extraction

**Remarks:**
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Collect:**
Lavender top preferred, Yellow top (ACD) or Blue top (citrate) acceptable

**Amount to Collect:**
3 mL blood

**Sample Type:**
Whole blood

**Preferred Volume:**
2 mL blood

**Minimum Volume:**
1 mL blood

**Unacceptable Conditions:**
Unlabeled, QNS, clotted samples. Samples collected in heparin

**Additional Information:**
Samples will be held for 30 days. If no testing is ordered within that time frame, the sample will be discarded. For questions, contact the molecular diagnostics laboratory at 514-8488.

CPT Codes:
81479
DNA Preparation & Storage  
HTCPP (Sunquest: ILCPP)  

ORDERING  

Available Stat:  
No  
Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)  
Methodology:  
Qiagen, EZ-1, Promega  

COLLECTION  

Sample Type:  
ACD anticoagulated whole blood  
Contact ITL at 415-476-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.  
Collect:  
Yellow top (ACD)  
Amount to Collect:  
8.5 mL blood  
Preferred Volume:  
8.5 mL blood  
For other specimens, contact ITL at 415-476-3887  
Minimum Volume:  
1 mL blood  
For other specimens, contact ITL at 415-476-3887  
Remarks:  
Fill ACD tube completely. Obtain ACD tube from Specimen Receiving. If being collected with other HLA intermediate resolution typing such as HLA-B, HLA-C, HLA-DR, HLA-DQ, etc., 1 tube is sufficient for all tests. Collect additional samples if white blood cell (WBC) count is low (<1,000).  
For other specimens, contact ITL at 415-476-3887  
Stability (from collection to initiation):  
Room temperature 5 days.  
For other specimens, contact ITL at 415-476-3887  
Unacceptable Conditions:  
WBC count too low (<1,000).  
For other specimens, contact ITL at 415-476-3387.  

PROCESSING  

Test Code:  
HTCPP (Sunquest: ILCPP)  
Sendout:  
Yes  
Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)  
Specimen Preparation:  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge
Preferred Volume: 8.5 mL blood

Minimum Volume: 1 mL blood

Unacceptable Conditions:
WBC count too low (<1,000).

Stability (from collection to initiation):
Room temperature 5 days.

ADMINISTRATIVE

CPT Codes: N/A

COMPLETE VIEW

Available Stat: No
Test Code: HTCPP (Sunquest: ILCPP)
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Sendout: Yes
Methodology: Qiagen, EZ-1, Promega
Remarks:
Fill ACD tube completely. Obtain ACD tube from Specimen Receiving. If being collected with other HLA intermediate resolution typing such as HLA-B, HLA-C, HLA-DR, HLA-DQ, etc., 1 tube is sufficient for all tests. Collect additional samples if white blood cell (WBC) count is low (<1,000).

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Sample Type:
ACD anticoagulated whole blood

Contact ITL at 415-476-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume: 8.5 mL blood

Minimum Volume: 1 mL blood
For other specimens, contact ITL at 415-476-3887

**Unacceptable Conditions:**
- WBC count too low (<1,000).

For other specimens, contact ITL at 415-476-3387.

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge

For other specimens, contact ITL at 415-476-3887

**Stability (from collection to initiation):**
- Room temperature 5 days.

For other specimens, contact ITL at 415-476-3887

**CPT Codes:**
- N/A
DNAase B Antibody
ADAB

ORDERING

Available Stat:  
No
Performing Lab:  
Quest at Specialty laboratories
Methodology:  
Nephelometry
Reported:  
Performed Monday-Friday. Turnaround time 4-7 days.
Additional Information:  
Clinical Significance: Dnase-B Antibody is useful in patients with group A streptococcal infection. DNase-B Antibody may persist for as long as three months.
Synonyms:  
- Anti-streptococcal DNAase B
- anti-DNAase B
- Deoxyribonuclease antibody
- Strepdornase antibody

COLLECTION

Sample Type:  
Serum
Collect:  
Gold top
Amount to Collect:  
2 mL blood
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.3 mL serum
Stability (from collection to initiation):  
Room temperature 1 week, refrigerated: 2 weeks, frozen at -20C 2 months.

PROCESSING

Test Code:  
ADAB
Sendout:  
Yes
Performing Lab:  
Quest at Specialty laboratories
Specimen Preparation:  
Separate serum and freeze at -20C. Order Quest # 256.
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.3 mL serum
Stability (from collection to initiation):  
Room temperature 1 week, refrigerated: 2 weeks, frozen at -20C 2 months.
RESULT INTERPRETATION

**Units:**
U/mL

**Reference Interval:**
<187 U/mL

**Additional Information:**
Clinical Significance: Dnase-B Antibody is useful in patients with group A streptococcal infection. DNase-B Antibody may persist for as long as three months.

ADMINISTRATIVE

**CPT Codes:**
86215-90

**LOINC Codes:**
14207-5

COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
ADAB

**Performing Lab:**
Quest at Specialty laboratories

**Sendout:**
Yes

**Methodology:**
Nephelometry

**Collect:**
Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.3 mL serum

**Specimen Preparation:**
Separate serum and freeze at -20C. Order Quest # 256.

**Units:**
U/mL

**Reference Interval:**
<187 U/mL

**Synonyms:**
- Anti-streptococcal DNAase B
- anti-DNAase B
- Deoxyribonuclease antibody
- Strepdornase antibody

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated: 2 weeks, frozen at -20C 2 months.

**Reported:**
Performed Monday-Friday. Turnaround time 4-7 days.

**Additional Information:**

Clinical Significance: Dnase-B Antibody is useful in patients with group A streptococcal infection. DNase-B Antibody may persist for as long as three months.

**CPT Codes:**
86215-90

**LOINC Codes:**
14207-5
Donath Landsteiner

ORDERING

Ordering Recommendations:
Identify the rarest form of autoimmune hemolytic anemia, paroxysmal cold hemoglobinuria (PCH), caused by a biphasic autohemolysin (autoanti-P [GLOB1]). Other red blood cell antibodies may interfere with testing, resulting in inconclusive results.

Performed:
Mon-Fri

Methodology:
Hemolysis

Reported:
1-3 days

Synonyms:
- Donath Landsteiner Antibody test

COLLECTION

Collect:
Plain red.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Separator or gel tubes.

PROCESSING

Test Code:
MOLT

ARUP Test Code:
0013039

Specimen Preparation:
Maintain specimen at 37°C until serum is separated from cells. Transport 2 mL serum. (Min: 1.5 mL)

Unacceptable Conditions:
Separator or gel tubes.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
By report

ADMINISTRATIVE

CPT Codes:
86940; 86941
Ordering Recommendations:
Identify the rarest form of autoimmune hemolytic anemia, paroxysmal cold hemoglobinuria (PCH), caused by a biphasic autohemolysin (autoanti-P [GLOB1]). Other red blood cell antibodies may interfere with testing, resulting in inconclusive results.

Test Code:
MOLT

ARUP Test Code:
0013039

Performed:
Mon-Fri

Methodology:
Hemolysis

Collect:
Plain red.

Unacceptable Conditions:
Separator or gel tubes.

Specimen Preparation:
Maintain specimen at 37°C until serum is separated from cells. Transport 2 mL serum. (Min: 1.5 mL)

Reference Interval:
By report

Synonyms:
• Donath Landsteiner Antibody test

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Reported:
1-3 days

CPT Codes:
86940; 86941
Double-Stranded DNA Antibody
ADNA

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday and Thursday (day shift)
Methodology:
Chemiluminescent immunoassay
Reported:
1-4 days
Synonyms:
- dsDNA Ab
- anti-DNA
- Deoxyribonucleic acid antibody
- DNA antibody
- dsDNA antibody
- ds-DNA antibody
- anti-ds-DNA
- anti-dsDNA

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum

PROCESSING

Test Code:
ADNA
Performing Lab:
Immunology
Specimen Preparation:
Freeze at -20°C
Preferred Volume:
0.5 mL serum

RESULT INTERPRETATION

Units:
IU/mL
Reference Interval:

Printed 06/07/19
Test information subject to change
Negative: < 27.0 IU/mL
Equivocal: 27.0 - 35.0 IU/mL
Positive: > 35.0 IU/mL

ADMINISTRATIVE

CPT Codes:
86255

LOINC Codes:
5130-0

COMPLETE VIEW

Available Stat:
No

Test Code:
ADNA

Performing Lab:
Immunology

Performed:
Monday and Thursday (day shift)

Methodology:
Chemiluminescent immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Specimen Preparation:
Freeze at -20C

Units:
IU/mL

Reference Interval:
Negative: < 27.0 IU/mL
Equivocal: 27.0 - 35.0 IU/mL
Positive: > 35.0 IU/mL

Synonyms:
- dsDNA Ab
- anti-DNA
- Deoxyribonucleic acid antibody
- DNA antibody
- dsDNA antibody
- ds-DNA antibody
- anti-ds-DNA
- anti-dsDNA

Reported:
1-4 days

CPT Codes:
86255

LOINC Codes:
5130-0
Doxepin
DOX

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Liquid Chromatography Tandem Mass Spectrometry
Reported: Test run 3x per week. Turnaround time 3-5 days
Additional Information: Assay measures both parent and nordoxepin metabolite. Potentially toxic: > 500 for the SUM of the two compounds. See also Drug Screening.
Synonyms:
- Adapin
- Sinequan

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 6 mL blood
Preferred Volume: 3 mL serum
Minimum Volume: 1.5 mL serum
Remarks:
- Do not use Gold top. Optimum time to collect is 10-14 hours after oral dose.
Stability (from collection to initiation):
- Room temperature 5 days, refrigerated 1 week, frozen at -20°C 1 month
Unacceptable Conditions:
- Collected in Gold top, hemolysis.

PROCESSING

Test Code: DOX
Test Group: Doxepin
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate.
Preferred Volume: 3 mL serum
Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Collected in Gold top, hemolysis.

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20°C 1 month

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
Therapeutic: 150-250 µg/L for SUM of Doxepin and Nordeoxepin

Critical Values:
Quest Priority-1: Doxepin + Nordoxepin >= 600 µg/L

Additional Information:
Assay measures both parent and nordoxepin metabolite. Potentially toxic: > 500 for the SUM of the two compounds. See also Drug Screening.

ADMINISTRATIVE

CPT Codes:
80166-90

LOINC Codes:
3579-0

COMPLETE VIEW

Available Stat:
No

Test Code:
DOX

Test Group:
Doxepin

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography Tandem Mass Spectrometry

Remarks:
Do not use Gold top. Optimum time to collect is 10-14 hours after oral dose.

Collect:
Red top

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Collected in Gold top, hemolysis.
Specimen Preparation:
   Refrigerate.

Units:
   µg/L (mcg/L)

Reference Interval:
   Therapeutic: 150-250 µg/L for SUM of Doxepin and Nordeoxepin

Critical Values:
   Quest Priority-1: Doxepin + Nordoxepin >= 600 µg/L

Synonyms:
   - Adapin
   - Sinequan

Stability (from collection to initiation):
   Room temperature 5 days, refrigerated 1 week, frozen at -20C 1 month

Reported:
   Test run 3x per week. Turnaround time 3-5 days

Additional Information:
   Assay measures both parent and nordoxepin metabolite. Potentially toxic: > 500 for the SUM of the two compounds. See also Drug Screening.

CPT Codes:
   80166-90

LOINC Codes:
   3579-0
Drug Detection Panel, Umbilical Cord Tissue, Qualitative
DOAUC

ORDERING

Ordering Recommendations:
Detect and document maternal drug use. Useful during approximately the last trimester of a full-term pregnancy. To test for marijuana metabolite, see Marijuana Metabolite, Umbilical Cord Tissue, Qualitative (3000256). To test for ethyl glucuronide, see Ethyl Glucuronide, Umbilical Cord Tissue, Qualitative (3000443).

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Qualitative Liquid Chromatography/Tandem Mass Spectrometry

Reported:
1-3 days

Synonyms:
- Drug Screen, Targeted, Serum or Plasma
- Drugs of Abuse Panel, Meconium - Screen with Reflex to Confirmation/Quantitation

COLLECTION

Collect:
Umbilical Cord (At least 8 inches, approximately the width of a sheet of paper.)

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 3 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Cords soaking in blood or other fluid. Formalin fixed. Tissue that is obviously decomposed.

PROCESSING

Test Code:
DOAUC

ARUP Test Code:
2006621

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Drain and discard any blood. Rinse the exterior of the cord segment with normal saline or water. Pat the cord dry and transport at least 8 inches of umbilical cord in a routine urine collection cup or Security Kit for Meconium/Umbilical Drug Detection (ARUP supply #51548) available online through eSupply using ARUP Connect(TM) or by contacting ARUP Client Services at (800) 522-2787.

Unacceptable Conditions:
Cords soaking in blood or other fluid. Formalin fixed. Tissue that is obviously decomposed.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 3 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION
Effective February 20, 2018

Drugs covered and range of cutoff concentrations.

<table>
<thead>
<tr>
<th>Drugs/Drug Classes</th>
<th>Cutoff Concentrations (ng/g)</th>
<th>Drugs/Drug Classes</th>
<th>Cutoff Concentrations (ng/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprenorphine</td>
<td>1</td>
<td>Amphetamine</td>
<td>5</td>
</tr>
<tr>
<td>Norbuprenorphine</td>
<td>0.5</td>
<td>Benzoylcegonine</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>m-OH-Benzoylecgonine</td>
<td>1</td>
</tr>
<tr>
<td>Codeine</td>
<td>0.5</td>
<td>Cocaethylene</td>
<td>1</td>
</tr>
<tr>
<td>Dihydrocodeine</td>
<td>1</td>
<td>Cocaine</td>
<td>0.5</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>0.5</td>
<td>MDMA (Ecstasy)</td>
<td>5</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>0.5</td>
<td>Methamphetamine</td>
<td>5</td>
</tr>
<tr>
<td>Norhydrocodone</td>
<td>1</td>
<td>Phentermine</td>
<td>8</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>0.5</td>
<td>Alprazolam</td>
<td>0.5</td>
</tr>
<tr>
<td>Meperidine</td>
<td>2</td>
<td>Alpha-OH-Alprazolam</td>
<td>0.5</td>
</tr>
<tr>
<td>Methadone</td>
<td>2</td>
<td>Butalbital</td>
<td>25</td>
</tr>
<tr>
<td>Methadone metabolite</td>
<td>1</td>
<td>Clonazepam</td>
<td>1</td>
</tr>
<tr>
<td>6-Acetylmorphine</td>
<td>1</td>
<td>7-Aminoclonazepam</td>
<td>1</td>
</tr>
<tr>
<td>Morphine</td>
<td>0.5</td>
<td>Diazepam</td>
<td>1</td>
</tr>
<tr>
<td>Naloxone</td>
<td>1</td>
<td>Lorazepam</td>
<td>5</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>0.5</td>
<td>Midazolam</td>
<td>1</td>
</tr>
<tr>
<td>Noroxycodone</td>
<td>1</td>
<td>Alpha-OH-Midazolam</td>
<td>2</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>0.5</td>
<td>Nordiazepam</td>
<td>1</td>
</tr>
<tr>
<td>Noroxymorphone</td>
<td>0.5</td>
<td>Oxazepam</td>
<td>2</td>
</tr>
<tr>
<td>Propoxyphene</td>
<td>1</td>
<td>Phenobarbital</td>
<td>75</td>
</tr>
<tr>
<td>Tapentadol</td>
<td>2</td>
<td>Temazepam</td>
<td>1</td>
</tr>
<tr>
<td>Tramadol</td>
<td>2</td>
<td>Zolpidem</td>
<td>0.5</td>
</tr>
<tr>
<td>N-desmethyltramadol</td>
<td>2</td>
<td>Phencyclidine (PCP)</td>
<td>1</td>
</tr>
<tr>
<td>O-desmethyltramadol</td>
<td>2</td>
<td>Gabapentin</td>
<td>10</td>
</tr>
</tbody>
</table>

Interpretive Data:

Methodology: Qualitative Liquid Chromatography/Tandem Mass Spectrometry

Detection of drugs in umbilical cord tissue is intended to reflect maternal drug use during approximately the last trimester of a full-term pregnancy. The pattern and frequency of drug(s) used by the mother cannot be determined by this test. A negative result does not exclude the possibility that a mother used drugs during pregnancy. Detection of drugs in umbilical cord tissue depends on extent of maternal drug use, as well as drug stability, unique characteristics of drug deposition in umbilical cord tissue, and the performance of the analytical method. Drugs administered during labor and delivery may be detected. Detection of drugs in umbilical cord tissue does not insinuate impairment and may not affect outcomes for the infant. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:

80307

COMPLETE VIEW

Ordering Recommendations:

Detect and document maternal drug use. Useful during approximately the last trimester of a full-term pregnancy. To test for marijuana metabolite, see Marijuana Metabolite, Umbilical Cord Tissue, Qualitative (3000256). To test for ethyl glucuronide, see Ethyl Glucuronide, Umbilical Cord Tissue, Qualitative (3000443).

Test Code:

DOAUC

ARUP Test Code:

2006621
Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Qualitative Liquid Chromatography/Tandem Mass Spectrometry

Collect:
Umbilical Cord (At least 8 inches, approximately the width of a sheet of paper.)

Unacceptable Conditions:
Cords soaking in blood or other fluid. Formalin fixed. Tissue that is obviously decomposed.

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Reference Interval:
Effective February 20, 2018

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Methodology: Qualitative Liquid Chromatography/Tandem Mass Spectrometry

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Synonyms:
• Drug Screen, Targeted, Serum or Plasma
• Drugs of Abuse Panel, Meconium - Screen with Reflex to Confirmation/Quantitation

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
Ambient: 1 week; Refrigerated: 3 weeks; Frozen: 1 year

**Reported:**
1-3 days

**CPT Codes:**
80307

**Notes:**
Absolute Minimum: 6 inches. For marijuana metabolite, order Marijuana Metabolite, Umbilical Cord Tissue, Qualitative (ARUP test code 3000256). For alcohol metabolite, order Ethyl Glucuronide, Umbilical Cord Tissue, Qualitative (ARUP test code 3000443).
Drug screen (general toxicology, not available stat)

ABUSU

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS/MS
Reported: 2-5 days.

Additional Information:
Toxicology screens are used to identify substances affecting a patient and to guide the clinician to predict future toxic effects, to confirm the differential diagnosis or to guide therapy. Accurate diagnosis of clinical intoxication secondary to illicit drug use based on clinical history and physical examination may be difficult without laboratory confirmation. This testing is also necessary when multiple drug ingestion is involved, as the effects of one drug may mask the clinical signs and symptoms of the effects of other drugs.

Click Here for list of Compounds covered in screen
Synonyms:
- Comprehensive urine drug screen

COLLECTION

Sample Type: Random urine (not orderable for other samples)
Collect: Urine cup
Amount to Collect: 20 mL
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen 1 month

PROCESSING

Test Code: ABUSU
Test Group: Drug screening
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Aliquot and freeze urine. Transport to CB frozen. Order Quest code 91359.
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Stability (from collection to initiation):

Room temperature 5 days, refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
No compounds detected

Additional Information:
Toxicology screens are used to identify substances affecting a patient and to guide the clinician to predict future toxic effects, to confirm the differential diagnosis or to guide therapy. Accurate diagnosis of clinical intoxication secondary to illicit drug use based on clinical history and physical examination may be difficult without laboratory confirmation. This testing is also necessary when multiple drug ingestion is involved, as the effects of one drug may mask the clinical signs and symptoms of the effects of other drugs.

Click Here for list of Compounds covered in screen

ADMINISTRATIVE

CPT Codes:
80100-90, 84600-90

LOINC Codes:
51782-1

COMPLETE VIEW

Available Stat:
No

Test Code:
ABUSU

Test Group:
Drug screening

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Urine cup

Amount to Collect:
20 mL

Sample Type:
Random urine (not orderable for other samples)

Preferred Volume:
5 mL urine

Minimum Volume:
1 mL urine

Specimen Preparation:
Aliquot and freeze urine. Transport to CB frozen. Order Quest code 91359.

Reference Interval:
No compounds detected

Synonyms:
- Comprehensive urine drug screen

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen 1 month

Reported:
2-5 days.

**Additional Information:**

Toxicology screens are used to identify substances affecting a patient and to guide the clinician to predict future toxic effects, to confirm the differential diagnosis or to guide therapy. Accurate diagnosis of clinical intoxication secondary to illicit drug use based on clinical history and physical examination may be difficult without laboratory confirmation. This testing is also necessary when multiple drug ingestion is involved, as the effects of one drug may mask the clinical signs and symptoms of the effects of other drugs.

[Click Here for list of Compounds covered in screen](#)

**CPT Codes:**

80100-90, 84600-90

**LOINC Codes:**

51782-1
Drug-Dependent Platelet Antibody
MOLT

ORDERING

Approval Required:
Yes; Approval from the Clinical Hematology Consult Service is required before order is placed.

Performing Lab:
Versiti

Methodology:
Flow Cytometry

Reported:
3-4 days

COLLECTION

Sample Type:
Serum

Collect:
2 red tops

Amount to Collect:
10 mL blood

Preferred Volume:
5 mL serum

Minimum Volume:
5 mL serum

Remarks:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing.

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
Versiti

Specimen Preparation:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing

Sample should be spun down and taken off the clot. Store refrigerated. Send sample refrigerated. Sample must be received within 7 days of draw date.

Preferred Volume:
5 mL serum

Minimum Volume:
5 mL serum
ADMINISTRATIVE

CPT Codes:
86022 per drug

COMPLETE VIEW

Approval Required:
Yes; Approval from the Clinical Hematology Consult Service is required before order is placed.

Test Code:
MOLT

Performing Lab:
Versiti

Sendout:
Yes

Methodology:
Flow Cytometry

Remarks:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing.

Collect:
2 red tops

Amount to Collect:
10 mL blood

Sample Type:
Serum

Preferred Volume:
5 mL serum

Minimum Volume:
5 mL serum

Specimen Preparation:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing.

Sample should be spun down and taken off the clot. Store refrigerated. Send sample refrigerated. Sample must be received within 7 days of draw date.

Reported:
3-4 days

CPT Codes:
86022 per drug
Drugs of abuse screen, rapid
DAU

ORDERING

Ordering Recommendations:

The primary use of this immunoassay is to screen for illicit use of commonly abused drugs when there is a suspicion that drug use may
be contributing to the clinical picture (e.g. altered mental status, coma).

Due to extensive cross reactivity and the inability of this assay to detect commonly prescribed medications (e.g. methadone) it is not
useful for determine patient adherence to therapeutic regimens or potential drug diversion. For this purpose order specific drug tests
(e.g. Opiates, urine, quantitative).

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzyme immunoassay method (Beckman UniCel DxC 800 analyzer)

Reported:
Stat 2 hours, Routine 4 hours

Additional Information:

This test is NOT useful for the detection or monitoring of prescribed opiates such as methadone, oxycodone, codeine or therapeutic
level of hydromorphone, or hydrocodone. See cross reactivity information below.

This test is not recommended for neonates where there is a question of maternal drug abuse as it is not as sensitive as the Quest drug
screen panel in meconium (Quest #30427X: Neonatal Drug Screen, Meconium; required specimen: 5g of meconium).

This test panel screens for the presence of: Amphetamines, Barbiturates, Benzodiazepine, Cocaine (as benzoylcegonine),
Cannabinoids and Opiates.

Each of the above panel components can be ordered separately.

This testing is performed using immunologic methods therefore these assays may cross-react with similar compounds. For a listing of
the cross-reactivities see the test menu entry for the individual drug/metabolite.

Detection Cutoff Limits:

<table>
<thead>
<tr>
<th>Drug/metabolite</th>
<th>Cutoff</th>
<th>Reported as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamines</td>
<td>&lt;1000 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>&lt;200 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>&lt;200 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Cocaine metabolite</td>
<td>&lt;300 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Opiates</td>
<td>&lt;300 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Cannabinoids</td>
<td>&lt;50 µg/L</td>
<td>NEG</td>
</tr>
</tbody>
</table>

CAUTION!: Presumptive screening test only. Cross reactions and false-positive results may occur within each drug class. However,
positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug(s) identified. False negative results can also occur in presence of low drug concentrations or drugs/metabolites that do not react in the assay [Click on the name of the drug(s) of interest from the list above for more information].

This test is NOT useful for the detection or monitoring of prescribed opiates such as methadone or fentanyl, or for therapeutic concentrations of hydromorphone, oxycodone or hydrocodone. (See cross reactivity information above). A separate oxycodone screen is available at UCSF (test code: OXYU) that detects oxycodone and oxymorphone. If hydrocodone or hydromorphone use is suspected, an opiate confirmation should be ordered from ARUP (test code: OPIQNT). False negative results may also occur as use of synthetic and some semi-synthetic opiates cannot be ruled out by this assay. Specifically, this assay will not detect use of fentanyl, methadone, meperidine or tramadol. A separate methadone screen is available at UCSF (test code: METHA). If use of opiates not detected by this screen is suspected, immunoassay screens can be ordered from ARUP [e.g. fentanyl (ARUP#2012284), meperidine (ARUP#2102288) or tramadol (ARUP#2012297)].

Typical Urine Detection Window after use:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Detection Time (hrs)</th>
<th>Max. Detection Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamine</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>87+/−51</td>
<td>6</td>
</tr>
<tr>
<td>Cannabis</td>
<td>34</td>
<td>95</td>
</tr>
<tr>
<td>Cocaine</td>
<td>48-72</td>
<td>22</td>
</tr>
<tr>
<td>Morphine</td>
<td>11-54</td>
<td>11</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>24</td>
<td>1-4 (Phenobarbital)</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>6</td>
<td>14 or longer in chronic users</td>
</tr>
</tbody>
</table>

From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205

Results cannot be used for Medico-legal purposes.

Confirmatory testing can be ordered for the specific class of agent found using the test order codes found under the ‘Processing’ tab of this test menu entry.

Confirmatory testing performed Monday-Friday with a 3-6 day turn around time after receipt by reference laboratory.

See also Drug Screening and individual drug entries.

Synonyms:
- amphetamines
- barbiturates
- cocaine
- opiates
- benzodiazepines
- THC
- cannabinoids
- cannibis
- cocaine metabolites
- benzoylecgonine
- drug screen
- drug test
• cannabis

### COLLECTION

**Sample Type:**
- Random urine

**Collect:**
- Urine cup

**Amount to Collect:**
- See preferred volume

**Preferred Volume:**
- 5 mL urine

**Minimum Volume:**
- 1.5 mL urine (insufficient for confirmation)

**Stability (from collection to initiation):**
- Refrigerated 1 week, frozen 2 weeks

### PROCESSING

**Test Code:**
- DAU

**Test Group:**
- Drug screening

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Specimen Preparation:**

Refrigerate. If requested freeze excess sample not used for this test for possible confirmatory testing at -20C.

Confirmatory testing can be ordered for the specific class of agent found using the following test order codes:

- Amphetamines: AMPQNT ARUP #2010075
- Barbiturates: BARQNT ARUP #2012213
- Benzodiazepines: BNZQNT ARUP #2008291
- Cocaine metabolite: COCQNT ARUP# 0090359
- Opiates: OPIQNT ARUP #0090364
- THC (Cannabinoids): THCQNT ARUP #0090369

**Preferred Volume:**
- 5 mL urine

**Minimum Volume:**
- 1.5 mL urine (insufficient for confirmation)

**Stability (from collection to initiation):**
- Refrigerated 1 week, frozen 2 weeks

### RESULT INTERPRETATION

**Units:**
- µg/L

**Reference Interval:**
- Negative (Note: a negative result indicates that the specific class of drugs is not present, or is present at a concentration below that of the cut off concentration. See each drug class for specific concentration cut-offs).
Additional Information:

This test is NOT useful for the detection or monitoring of prescribed opiates such as methadone, oxycodone, codeine or therapeutic level of hydromorphone, or hydrocodone. See cross reactivity information below.

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<tr>
<th>Drug/metabolite</th>
<th>Cutoff</th>
<th>Reported as</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamines</td>
<td>&lt;1000 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>&lt;200 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>&lt;200 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Cocaine metabolite</td>
<td>&lt;300 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Opiates</td>
<td>&lt;300 µg/L</td>
<td>NEG</td>
</tr>
<tr>
<td>Cannabinoids</td>
<td>&lt;50 µg/L</td>
<td>NEG</td>
</tr>
</tbody>
</table>

CAUTION!: Presumptive screening test only. Cross reactions and false-positive results may occur within each drug class. However, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug(s) identified. False negative results can also occur in presence of low drug concentrations or drugs/metabolites that do not react in the assay [Click on the name of the drug(s) of interest from the list above for more information].

This test is NOT useful for the detection or monitoring of prescribed opiates such as methadone or fentanyl, or for therapeutic concentrations of hydromorphone, oxycodone or hydrocodone. (See cross reactivity information above). A separate oxycodone screen is available at UCSF (test code: OXYU) that detects oxycodone and oxymorphone. If hydrocodone or hydromorphone use is suspected, an opiate confirmation should be ordered from ARUP (test code: OPIQNT). False negative results may also occur as use of synthetic and some semi-synthetic opiates cannot be ruled out by this assay. Specifically, this assay will not detect use of fentanyl, methadone, meperidine or tramadol. A separate methadone screen is available at UCSF (test code: METHA). If use of opiates not detected by this screen is suspected, immunoassay screens can be ordered from ARUP [e.g. fentanyl (ARUP#2012284), meperidine (ARUP#2102288) or tramadol (ARUP#2012297)].

Typical Urine Detection Window after use:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Detection Time (hrs)</th>
<th>Max. Detection Time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamine</td>
<td>24</td>
<td>9</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>87+/−51</td>
<td>6</td>
</tr>
<tr>
<td>Cannabis</td>
<td>34</td>
<td>95</td>
</tr>
<tr>
<td>Cocaine</td>
<td>48-72</td>
<td>22</td>
</tr>
<tr>
<td>Morphine</td>
<td>11-54</td>
<td>11</td>
</tr>
<tr>
<td>Barbiturates</td>
<td>24</td>
<td>1-4 (Phenobarbital)</td>
</tr>
</tbody>
</table>
Benzodiazepines 6 14 or longer in chronic users

From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205

Results cannot be used for Medico-legal purposes.

Confirmatory testing can be ordered for the specific class of agent found using the test order codes found under the 'Processing' tab of this test menu entry.

Confirmatory testing performed Monday-Friday with a 3-6 day turn around time after receipt by reference laboratory.

See also Drug Screening and individual drug entries.

ADMINISTRATIVE

CPT Codes:
80301 x6

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:

The primary use of this immunoassay is to screen for illicit use of commonly abused drugs when there is a suspicion that drug use may be contributing to the clinical picture (e.g. altered mental status, coma).

Due to extensive cross reactivity and the inability of this assay to detect commonly prescribed medications (e.g. methadone) it is not useful for determine patient adherence to therapeutic regimens or potential drug diversion. For this purpose order specific drug tests (e.g. Opiates, urine, quantitative).

Test Code:
DAU

Test Group:
Drug screening

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzyme immunoassay method (Beckman UniCel DxC 800 analyzer)

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
5 mL urine

Minimum Volume:
1.5 mL urine (insufficient for confirmation)

Specimen Preparation:
Refrigerate. If requested freeze excess sample not used for this test for possible confirmatory testing at -20C

Confirmatory testing can be ordered for the specific class of agent found using the following test order codes:

- **Amphetamines**  AMPQNT  ARUP #2010075
- **Barbiturates**  BARQNT  ARUP #2012213
- **Benzodiazepines**  BNZQNT  ARUP #2008291
- **Cocaine metabolite**  COCQNT  ARUP# 0090359
- **Opiates**  OPIQNT  ARUP #0090364
- **THC (Cannabinoids)**  THCQNT  ARUP #0090369

**Units:**  µg/L

**Reference Interval:**
Negative(Note: a negative result indicates that the specific class of drugs is not present, or is present at a concentration below that of the cut off concentration. See each drug class for specific concentration cut-offs).

**Synonyms:**
- amphetamines
- barbiturates
- cocaine
- opiates
- benzodiazepines
- THC
- cannabinoids
- cannibis
- cocaine metabolites
- benzoylecgonine
- drug screen
- drug test
- cannabis

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen 2 weeks

**Reported:**
Stat 2 hours, Routine 4 hours

**Additional Information:**

This test is NOT useful for the detection or monitoring of prescribed opiates such as methadone, oxycodone, codeine or therapeutic level of hydromorphone, or hydrocodone. See cross reactivity information below.

This test is not recommended for neonates where there is a question of maternal drug abuse as it is not as sensitive as the Quest drug screen panel in meconium (Quest #30427X: Neonatal Drug Screen, Meconium; required specimen: 5g of meconium).

This test panel screens for the presence of: Amphetamines, Barbiturates, Benzodiazepine, Cocaine (as benzoylecgonine), Cannabinoids and Opiates.

Each of the above panel components can be ordered separately.

This testing is performed using immunologic methods therefore these assays may cross-react with similar compounds. For a listing of the cross-reactivities see the test menu entry for the individual drug/metabolite.

Detection Cutoff Limits:
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From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205

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Confirmatory testing performed Monday-Friday with a 3-6 day turn around time after receipt by reference laboratory.

See also Drug Screening and individual drug entries.

**CPT Codes:**
80301 x6
**Duplication 1Q FISH**

**DU1Q, BDUP1Q**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily Monday - Friday

**Methodology:**
- Fluorescent In-situ hybridization (FISH)

**Reported:**
- 1-2 weeks

**Synonyms:**
- CKS1B Amplification
- Dup 1Q
- DUP1Q
- BDUP1Q

### COLLECTION

**Sample Type:**
- Heparinized whole blood or bone marrow. Bone marrow biopsy

**Collect:**
- Dark green top (Sodium heparin)

**Amount to Collect:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Remarks:**
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

**Stability (from collection to initiation):**
- Room temperature 2 days

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

### PROCESSING

**Test Code:**
- BDUP1Q: Blood
- DUP1Q: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Specimen Preparation:**

---

Test information subject to change.
Keep at room temperature, do not centrifuge

Preferred Volume:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm

Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL
  Bone marrow biopsy: 1 cm

Unacceptable Conditions:
  Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
  Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
  Absent

ADMINISTRATIVE

CPT Codes:
  88271 x2, 88275

LDT or Modified FDA:
  Yes

COMPLETE VIEW

Available Stat:
  No

Test Code:
  BDUP1Q: Blood
  DUP1Q: Bone marrow

Performing Lab:
  Medical Genomics - Cytogenetics

Performed:
  Set up daily Monday - Friday

Methodology:
  Fluorescent In-situ hybridization (FISH)

Remarks:
  Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
  Dark green top (Sodium heparin)

Amount to Collect:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm

Sample Type:
  Heparinized whole blood or bone marrow. Bone marrow biopsy

Preferred Volume:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm

Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL

Printed 06/07/19
Test information subject to change
Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

**Specimen Preparation:**
- Keep at room temperature, do not centrifuge

**Reference Interval:**
- Absent

**Synonyms:**
- CKS1B Amplification
- Dup 1Q
- DUP1Q
- BDUP1Q

**Stability (from collection to initiation):**
- Room temperature 2 days

**Reported:**
- 1-2 weeks

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes
**D-Xylose Absorption, blood**

**XYL1**

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Colorimetry

**Reported:**
- Blood test set up as needed; urine test performed Monday-Friday. Turnaround time: 1-4 days.

**Synonyms:**
- xylose

**COLLECTION**

**Patient Preparation:**
- Adults must have fasted for 8 hours prior to sample collection. Children must fast for 4 hours before sample collection. Outpatients should be given a prescription for the proper dose of (D+)-xylose powder to be obtained at an outside pharmacy.

**Sample Type:**
- Blood

**Collect:**
- Gray top

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 4 mL blood

**Minimum Volume:**
- 1 mL blood

**Remarks:**
- Note the dose on the requisition and in the patient's chart. Dose: 1.0 g/kg-maximum 25 g. Draw sample 1 hour after D-xylose administration.

**PROCESSING**

**Test Code:**
- XYL1

**Test Group:**
- D-Xylose

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Mix the sample well and refrigerate it-do not freeze. Enter the xylose dose in the computer at the time of accession. Order Quest # 1199X.

**Preferred Volume:**
- 4 mL blood

**Minimum Volume:**
- 1 mL blood

**RESULT INTERPRETATION**

**Test information subject to change**
Units:
mg/dL

Reference Interval:
<6 years: >14.9 mg/dL
>= 6 years: >19.9 mg/dL

ADMINISTRATIVE

CPT Codes:
84620-90

LOINC Codes:
30575-5

COMPLETE VIEW

Available Stat:
No

Test Code:
XYL1

Test Group:
D-Xylose

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Colorimetry

Patient Preparation:
Adults must have fasted for 8 hours prior to sample collection. Children must fast for 4 hours before sample collection. Outpatients should be given a prescription for the proper dose of (D+)-xylose powder to be obtained at an outside pharmacy.

Remarks:
Note the dose on the requisition and in the patient's chart. Dose: 1.0 g/kg-maximum 25 g. Draw sample 1 hour after D-xylose administration.

Collect:
Gray top

Amount to Collect:
4 mL blood

Sample Type:
Blood

Preferred Volume:
4 mL blood

Minimum Volume:
1 mL blood

Specimen Preparation:
Mix the sample well and refrigerate it-do not freeze. Enter the xylose dose in the computer at the time of accession. Order Quest #1199X.

Units:
mg/dL

Reference Interval:
<6 years: >14.9 mg/dL
>= 6 years: >19.9 mg/dL

Synonyms:
• xylose

Reported:
Blood test set up as needed; urine test performed Monday-Friday. Turnaround time: 1-4 days.

CPT Codes:
84620-90

LOINC Codes:
30575-5
D-Xylose Absorption, urine
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Colorimetry
Reported: Urine test performed Monday-Friday. Turnaround time: 1-4 days.

COLLECTION

Sample Type: 5-hour urine
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output over 5 hour period
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Remarks: Refrigerate container during collection.
Unacceptable Conditions: Container not refrigerated during collection.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: D-Xylose
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Transfer urine sample promptly to a gray top vacutainer tube containing fluoride and oxalate to inhibit metabolism of the xylose. Mix well and refrigerate, do not freeze. Enter the xylose dose in the computer at the time of accession and record the total urine volume on the request slip and the gray top tube. Order Quest # 6925
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Unacceptable Conditions: Container not refrigerated during collection.

RESULT INTERPRETATION
Units:
  g

Reference Interval:
  >= 18 year old: > 4.0 g excreted in 5 hours after a 25 g dose
  >= 18 year old: > 1.2 g after a 5g dose

Child: 16-33% of the ingested dose

Available Stat:
  No

Test Code:
  MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
  D-Xylose

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Colorimetry

Remarks:
  Refrigerate container during collection.

Collect:
  24 hour urine collection container

Amount to Collect:
  Entire urine output over 5 hour period

Sample Type:
  5-hour urine

Preferred Volume:
  5 mL urine

Minimum Volume:
  1 mL urine

Unacceptable Conditions:
  Container not refrigerated during collection.

Specimen Preparation:
  Transfer urine sample promptly to a gray top vacutainer tube containing fluoride and oxalate to inhibit metabolism of the xylose. Mix well and refrigerate, do not freeze. Enter the xylose dose in the computer at the time of accession and record the total urine volume on the request slip and the gray top tube. Order Quest # 6925

Units:
  g

Reference Interval:
  >= 18 year old: > 4.0 g excreted in 5 hours after a 25 g dose
  >= 18 year old: > 1.2 g after a 5g dose

Child: 16-33% of the ingested dose

Reported:
  Urine test performed Monday-Friday. Turnaround time: 1-4 days.
E. coli O157 culture
P157

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, all shifts.
Methodology:
Culture
Reported:
1-3 days
Additional Information:
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed if appropriate. Susceptibility testing may be omitted upon request when sample is submitted for testing.

Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

Synonyms:
- Shiga toxin
- Toxigenic E. coli
- Enteropathogenic E coli

COLLECTION

Sample Type:
Stool
Collect:
Urine cup or C & S (Cary & Blair) transport medium
Amount to Collect:
5 mL
Preferred Volume:
5 mL
Minimum Volume:
Fresh stool : 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL
Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C &S (Cary &Blair) Medium. Add stool to red line on vial and mix well with spoon. C &S (Cary &Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories’ draw stations.

For patient collect samples, order PMM 68902 C &S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C &S Medium 2805-05 (without bag or instructions) also available.

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week
Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.
**PROCESSING**

**Test Code:**  
P157

**Performing Lab:**  
Microbiology

**Specimen Preparation:**  
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

**Preferred Volume:**  
5 mL

**Minimum Volume:**  
Fresh stool: 0.5 mL or size of pea. Stool in C & S (Cary & Blair) transport medium: 5 mL

**Unacceptable Conditions:**  
Unpreserved stool received > 3 hours after collection. More than two samples per day.

**Stability (from collection to initiation):**  
Unpreserved 3 hours, preserved 1 week

**RESULT INTERPRETATION**

**Critical Values:**  
Inpatient results only. After hours outpatient results will be phoned the following morning. Positive for E. coli O157

**Additional Information:**  
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed if appropriate. Susceptibility testing may be omitted upon request when sample is submitted for testing.

Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

**ADMINISTRATIVE**

**CPT Codes:**  
87046

**LOINC Codes:**  
10851-4

**COMPLETE VIEW**

**Available Stat:**  
No

**Test Code:**  
P157

**Performing Lab:**  
Microbiology

**Performed:**  
Set up daily, all shifts.

**Methodology:**  
Culture

**Remarks:**  
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon. C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations.
For patient collect samples, order PMM 68902 C &S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C &S Medium 2805-05 (without bag or instructions) also available.

Collect:
Urine cup or C & S (Cary & Blair) transport medium

Amount to Collect:
5 mL

Sample Type:
Stool

Preferred Volume:
5 mL

Minimum Volume:
Fresh stool: 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.

Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. Positive for E. coli O157

Synonyms:
• Shiga toxin
• Toxigenic E. coli
• Enteropathogenic E. coli

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week

Reported:
1-3 days

Additional Information:
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

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CPT Codes:
87046

LOINC Codes:
10851-4
Echinococcus granulosa Antibody (IgG)

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Immunoassay +/- Western Blot
Reported:
Set up once per week. Turnaround 5-7 days
Additional Information:
Detection of serum antibodies to Echinococcus plays an important role in the diagnosis of hydatid disease, since infected individuals do not exhibit fecal shedding of Echinococcus eggs. The frequency of a positive result for serum antibodies may persist for years after cyst removal. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

Increasing antibody values between acute and convalescent specimens is considered evidence of recent or current infection. The frequency of a positive result for serum antibodies to Echinococcus is higher in patients with active cysts in the liver than in patients with hydatid cysts in the lung or calcified cysts. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

See also Parasites-Duodenal,-Sputum and-Stool
Reflex Testing:
Positive-equivocal samples will automatically have a Western Blot performed with a separate charge.
Synonyms:
- hydatid disease

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

PROCESSING

Test Code:
ECHINO
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Freeze sample. Order Quest #91307
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Detection of serum antibodies to Echinococcus plays an important role in the diagnosis of hydatid disease, since infected individuals do not exhibit fecal shedding of Echinococcus eggs. The frequency of a positive result for serum antibodies may persist for years after cyst removal. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

Increasing antibody values between acute and convalescent specimens is considered evidence of recent or current infection. The frequency of a positive result for serum antibodies to Echinococcus is higher in patients with active cysts in the liver than in patients with hydatid cysts in the lung or calcified cysts. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

See also Parasites-Duodenal,-Sputum and-Stool

ADMINISTRATIVE

CPT Codes:
86682-90

LOINC Codes:
47431-2

COMPLETE VIEW

Available Stat:
No

Test Code:
ECHINO

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immonoassay +/- Western Blot

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze sample. Order Quest #91307

Reference Interval:
Negative

Synonyms:
- hydatid disease

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
Set up once per week. Turnaround 5-7 days

Reflex Testing:
Positive/equivocal samples will automatically have a Western Blot performed with a separate charge.

Additional Information:
Detection of serum antibodies to Echinococcus plays an important role in the diagnosis of hydatid disease, since infected individuals do not exhibit fecal shedding of Echinococcus eggs. The frequency of a positive result for serum antibodies may persist for years after cyst removal. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

Increasing antibody values between acute and convalescent specimens is considered evidence of recent or current infection. The frequency of a positive result for serum antibodies to Echinococcus is higher in patients with active cysts in the liver than in patients with hydatid cysts in the lung or calcified cysts. Serologic crossreactivity between Echinococcus and Cysticercus may occur.

See also Parasites-Duodenal,-Sputum and-Stool

CPT Codes:
86682-90

LOINC Codes:
47431-2
## Ectoparasite identification

### P416

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Microbiology

**Performed:**
- Monday-Friday, day shift

**Additional Information:**
If Lyme disease IFA testing is requested, Ixodes species ticks will be forwarded to County of Sonoma Department of Health Services Public Health Laboratory, 3313 Chanate Road, Rm. 214, Santa Rosa, CA 95404 707-565-4711. An additional charge will be billed to patient. Test is performed on Thursday morning, and positive results are reported the following day.

**Synonyms:**
- flea
- insect
- mite
- tick
- arthropod
- scabies
- bedbug
- louse

## COLLECTION

**Sample Type:**
- Arthropod; skin scrapings

**Collect:**
- Urine cup or clean container

**Remarks:**
Place insect in gauze or tissue moistened with water and submit in a clean container. Refrigerate until submitted to laboratory.

Skin scrapings for scabies: Scrapings are best performed at the end of the burrows in non-excoriated and non-inflamed areas using a sterile scalpel blade containing a drop of mineral oil. The mineral oil enhances the adherence of the mites to the blade and can then be transferred to a glass slide. Glass slides can be “sandwiched” together and placed in a sterile container for transport to the lab.

**Stability (from collection to initiation):**
- Moist ticks are stable for 1 month at room temperature. Skin scrapings should be submitted to the lab as soon as possible.

**Unacceptable Conditions:**
- Improperly collected or stored sample

## PROCESSING

**Test Code:**
- P416

**Performing Lab:**
- Microbiology

**Unacceptable Conditions:**
- Improperly collected or stored sample

**Stability (from collection to initiation):**
- Moist ticks are stable for 1 month at room temperature. Skin scrapings should be submitted to the lab as soon as possible.
RESULT INTERPRETATION

Reference Interval:
No parasites seen

Additional Information:
If Lyme disease IFA testing is requested, Ixodes species ticks will be forwarded to County of Sonoma Department of Health Services Public Health Laboratory, 3313 Chanate Road, Rm. 214, Santa Rosa, CA 95404 707-565-4711. An additional charge will be billed to patient. Test is performed on Thursday morning, and positive results are reported the following day.

ADMINISTRATIVE

CPT Codes:
87168

LOINC Codes:
673-4

COMPLETE VIEW

Available Stat:
No

Test Code:
P416

Performing Lab:
Microbiology

Performed:
Monday-Friday, day shift

Remarks:
Place insect in gauze or tissue moistened with water and submit in a clean container. Refrigerate until submitted to laboratory.

Skin scrapings for scabies: Scrapings are best performed at the end of the burrows in non-excoriated and non-inflamed areas using a sterile scalpel blade containing a drop of mineral oil. The mineral oil enhances the adherence of the mites to the blade and can then be transferred to a glass slide. Glass slides can be “sandwiched” together and placed in a sterile container for transport to the lab.

Collect:
Urine cup or clean container

Sample Type:
Arthropod; skin scrapings

Unacceptable Conditions:
Improperly collected or stored sample

Reference Interval:
No parasites seen

Synonyms:
- flea
- insect
- mite
- tick
- arthropod
- scabies
- bedbug
- louse

Stability (from collection to initiation):
Moist ticks are stable for 1 month at room temperature. Skin scrapings should be submitted to the lab as soon as possible.

Additional Information:
If Lyme disease IFA testing is requested, Ixodes species ticks will be forwarded to County of Sonoma Department of Health Services Public Health Laboratory, 3313 Chanate Road, Rm. 214, Santa Rosa, CA 95404 707-565-4711. An additional charge will be billed to
patient. Test is performed on Thursday morning, and positive results are reported the following day.

CPT Codes:
87168

LOINC Codes:
673-4
### Ehrlichia chaffeensis Antibodies (IgG & IgM)  
**EHRL**

#### ORDERING

**Available Stat:**
No

**Performing Lab:**
Focus via Quest

**Methodology:**
Immunofluorescence assay

**Reported:**
Set up 6x per week, turnaround 4-5 days

**Additional Information:**
Human monocytic ehrlichiosis (HME), a tick-transmitted disease caused by Ehrlichia chaffeensis bacteria and is often described as 'spotless' Rocky Mountain spotted fever has been reported in various regions of the United States. Infected individuals produce specific antibody to E. chaffeensis which can be detected by the IFA test. A single IgG titer of 1:64 or greater indicates exposure to E. chaffeensis. A four fold or greater rise in IgG titer between acute and convalescent sera and/or an IgM titer of 1:20 or more is suggestive of recent or current infection.

This test was developed and its performance characteristics determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

**Synonyms:**
- Human Monocytic ehrlichiosis
- HME

#### COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top (Gold top NOT acceptable)

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Stability (from collection to initiation):**
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.

**Unacceptable Conditions:**
Sample collected in Gold top

#### PROCESSING

**Test Code:**
EHRL

**Test Group:**
Ehrlichia

**Sendout:**
Yes

**Performing Lab:**
Focus via Quest
Specimen Preparation:
Refrigerate sample. Order Quest # 8524N

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Sample collected in Gold top

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
titer

Reference Interval:
IgG: < 1:64 titer
IgM: < 1:20 titer

Additional Information:
Human monocytic ehrlichiosis (HME), a tick-transmitted disease caused by Ehrlichia chaffeensis bacteria and is often described as 'spotless' rocky mountain spotted fever has been reported in various regions of the United States. Infected individuals produce specific antibody to E. chaffeensis which can be detected by the IFA test. A single IgG titer of 1:64 or greater indicates exposure to E. chaffeensis. A four fold or greater rise in IgG titer between acute and convalescent sera and/or an IgM titer of 1:20 or more is suggestive of recent or current infection.

This test was developed and its performance characteristics determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

ADMINISTRATIVE

CPT Codes:
86666-90 x2

LOINC Codes:
45059-3

COMPLETE VIEW

Available Stat:
No

Test Code:
EHRL

Test Group:
Ehrlichia

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immunofluorescence assay

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum
Preferred Volume:  
1 mL serum  
Minimum Volume:  
0.2 mL serum  
Unacceptable Conditions:  
Sample collected in Gold top  
Specimen Preparation:  
Refrigerate sample. Order Quest # 8524N  
Units:  
titer  
Reference Interval:  
IgG: < 1:64 titer  
IgM: < 1:20 titer  
Synonyms:  
• Human Monocytic ehrlichiosis  
• HME  
Stability (from collection to initiation):  
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month.  
Reported:  
Set up 6x per week, turnaround 4-5 days  
Additional Information:  
Human monocytic ehrlichiosis (HME), a tick-transmitted disease caused by Ehrlichia chaffeensis bacteria and is often described as 'spotless' rocky mountain spotted fever has been reported in various regions of the United States. Infected individuals produce specific antibody to E. chaffeensis which can be detected by the IFA test. A single IgG titer of 1:64 or greater indicates exposure to E. chaffeensis. A four fold or greater rise in IgG titer between acute and convalescent sera and/or an IgM titer of 1:20 or more is suggestive of recent or current infection.

This test was developed and its performance characteristics determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.  
CPT Codes:  
86666-90 x2  
LOINC Codes:  
45059-3
Electrolytes, Plasma / Serum
LYTE

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Includes sodium, potassium, chloride and carbon dioxide, total. Individual tests may be ordered separately.
Synonyms:
- Sodium
- Potassium
- Chloride
- CO2
- Carbon dioxide
- K
- Na
- CL
- K+
- Na+
- Cl-

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.25 mL plasma or serum

PROCESSING

Test Code:
LYTE
Test Group:
Electrolytes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.25 mL plasma or serum

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
See individual test entries for normal ranges.

Critical Values:
Sodium: < 125 or > 155 mmol/L
Potassium: < 3.0 or > 6.0 mmol/L
CO2, Total: < 15 or > 40 mmol/L

Additional Information:
Includes sodium, potassium, chloride and carbon dioxide, total. Individual tests may be ordered separately.

ADMINISTRATIVE

CPT Codes:
80051

COMPLETE VIEW

Available Stat:
Yes

Test Code:
LYTE

Test Group:
Electrolytes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.25 mL plasma or serum

Units:
mmol/L

Reference Interval:
See individual test entries for normal ranges.

Critical Values:
Sodium: < 125 or > 155 mmol/L
Potassium: < 3.0 or > 6.0 mmol/L
CO2, Total: < 15 or > 40 mmol/L

Synonyms:
- Sodium
- Potassium
- Chloride
- CO2
- Carbon dioxide
- K
- Na
- CL
- K+
- Na+
- Cl-

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Includes sodium, potassium, chloride and carbon dioxide, total. Individual tests may be ordered separately.

**CPT Codes:**
80051
Endothelial Cell Crossmatch (for Donor)
HTENDOXM (Sunquest: ILENDD)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
● Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTENDOXM (Sunquest: ILENDD)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

RESULT INTERPRETATION

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:
86833

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTENDOXM (Sunquest: ILENDD)
Test Group:
HLA Antibody Testing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Luminex-based
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Collect:
Red top
Amount to Collect:
6 mL blood
Sample Type:
Serum
Preferred Volume:
3 mL serum
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Reflex Testing:
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
**Endothelial Cell Crossmatch (for Recipient)**

**HTENDOXM (Sunquest: ILENDX)**

### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
- Luminex-based

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Additional Information:**
- This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**Reflex Testing:**
- Yes

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top

**Amount to Collect:**
- 6 mL blood

**Preferred Volume:**
- 3 mL serum

**Remarks:**
- SAMPLE COLLECTION GUIDE FOR ITL TESTS
  - ITL (415) 476-3387
  - Stability (from collection to initiation):
    - If kept at ambient temperature, can be good for up to 72 hours
  - Unacceptable Conditions:
    - Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

### PROCESSING

**Test Code:**
- HTENDOXM (Sunquest: ILENDX)

**Test Group:**
- HLA Antibody Testing

**Sendout:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
3 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

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**RESULT INTERPRETATION**

**Additional Information:**
- This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
- 86833

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**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTENDOXM (Sunquest: ILENDX)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**
- [SAMPLE COLLECTION GUIDE FOR ITL TESTS](#)
  
  ITL (415) 476-3387

**Collect:**
- Red top

**Amount to Collect:**
- 6 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 3 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
Entamoeba histolytica antibody (IgG)

ORDERING

Available Stat: No
Performing Lab: Focus
Methodology: ELISA
Reported: Test performed once per week. Turnaround 5-7 days.

Additional Information:
For patients who are unable to make antibodies, PCR of abscess fluid is available through the CDC. Contact the Microbiology Lab at x3-1268 for more information.

Synonyms:
• Amebiasis
• Entamoeba
• Protozoa

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum
Stability (from collection to initiation): Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month

PROCESSING

Test Code: AMOEB
Test Group: E. histolytica
Sendout: Yes
Performing Lab: Focus
Specimen Preparation: Freeze serum at -20C. Order Quest test # 34728N
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum
Stability (from collection to initiation):
RESULT INTERPRETATION

Reference Interval:
- Negative
- Not detected: < 1.00
- Detected: >= 1.00

Additional Information:
For patients who are unable to make antibodies, PCR of abscess fluid is available through the CDC. Contact the Microbiology Lab at x3-1268 for more information.

ADMINISTRATIVE

CPT Codes:
- 86753-90

LOINC Codes:
- 9522-4

COMPLETE VIEW

Available Stat:
- No

Test Code:
- AMOEB

Test Group:
- E. histolytica

Performing Lab:
- Focus

Sendout:
- Yes

Methodology:
- ELISA

Collect:
- Red top or Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.25 mL serum

Specimen Preparation:
- Freeze serum at -20C. Order Quest test # 34728N

Reference Interval:
- Negative
- Not detected: < 1.00
- Detected: >= 1.00

Synonyms:
- Amebiasis
- Entamoeba
- Protozoa

Stability (from collection to initiation):
- Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month
Reported:
  Test performed once per week. Turnaround 5-7 days.

Additional Information:
  For patients who are unable to make antibodies, PCR of abscess fluid is available through the CDC. Contact the Microbiology Lab at x3-1268 for more information.

CPT Codes:
  86753-90

LOINC Codes:
  9522-4
Entamoeba histolytica Antigen
EHAG

ORDERING

Available Stat:
No

Performing Lab:
Quest

Methodology:
EIA

Reported:
Set up: Monday, Wednesday, Friday. Report available: 1-4 days

Additional Information:
Extraintestinal amebiasis is frequently found without trophozoites or cysts in stool; patients may have a negative stool antigen result. Entamoeba histolytica are intestinal parasites that infect a half billion people worldwide annually. Of those infected, most are infected with the non-pathogenic E. dispar, which has not been associated with disease. It is estimated that approximately 10% of the half billion people infected each year are infected with the pathogenic E. histolytica. These individuals become symptomatic and develop colitis and liver abscesses.

Synonyms:
- Entamoeba histolytica Ag

COLLECTION

Sample Type:
Stool

Collect:
Urine cup (DO NOT collect in C & S (Cary & Blair) or O&P collection kit)

Amount to Collect:
2 gm

Preferred Volume:
2 gm

Minimum Volume:
1 gm

Remarks:
No special preservative is required. Transport to lab immediately after collection. C & S (Cary & Blair) or O&P collection set are unacceptable

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 2 days, frozen 1 week

Unacceptable Conditions:
Samples collected in preservative

Rejection Criteria:
Specimens stored in 10% formalin, SAF, PVA or equivalent fixatives • C & S (Cary & Blair) • Rectal swabs • Diaper specimens • Liver abscess

PROCESSING

Test Code:
EHAG

Sendout:
yes

Performing Lab:
Quest

Specimen Preparation:
Freeze stool and transport to China Basin frozen. Order Quest test code 63982P
Preferred Volume:  
2 gm

Minimum Volume:  
1 gm

Unacceptable Conditions:  
Samples collected in preservative

Rejection Criteria:  
Specimens stored in 10% formalin, SAF, PVA or equivalent fixatives • C & S (Cary & Blair) • Rectal swabs • Diaper specimens • Liver abscess

Stability (from collection to initiation):  
Room temperature 2 hours, refrigerated 2 days, frozen 1 week

RESULT INTERPRETATION

Reference Interval:  
Not detected

Additional Information:  
Extraintestinal amebiasis is frequently found without trophozoites or cysts in stool; patients may have a negative stool antigen result. Entamoeba histolytica are intestinal parasites that infect a half billion people worldwide annually. Of those infected, most are infected with the non-pathogenic E. dispar, which has not been associated with disease. It is estimated that approximately 10% of the half billion people infected each year are infected with the pathogenic E. histolytica. These individuals become symptomatic and develop colitis and liver abscesses.

ADMINISTRATIVE

CPT Codes:  
87334-7-90

LOINC Codes:  
29905-7

COMPLETE VIEW

Available Stat:  
No

Test Code:  
EHAG

Performing Lab:  
Quest

Sendout:  
yes

Methodology:  
EIA

Remarks:  
No special preservative is required. Transport to lab immediately after collection. C & S (Cary & Blair) or O&P collection set are unacceptable

Collect:  
Urine cup (DO NOT collect in C & S (Cary & Blair) or O&P collection kit)

Amount to Collect:  
2 gm

Sample Type:  
Stool

Preferred Volume:  
2 gm

Minimum Volume:  
1 gm
Rejection Criteria:
- Specimens stored in 10% formalin, SAF, PVA or equivalent fixatives • C &S (Cary & Blair) • Rectal swabs • Diaper specimens • Liver abscess

Unacceptable Conditions:
- Samples collected in preservative

Specimen Preparation:
- Freeze stool and transport to China Basin frozen. Order Quest test code 63982P

Reference Interval:
- Not detected

Synonyms:
- Entamoeba histolytica Ag

Stability (from collection to initiation):
- Room temperature 2 hours, refrigerated 2 days, frozen 1 week

Reported:
- Set up: Monday, Wednesday, Friday. Report available: 1-4 days

Additional Information:
- Extraintestinal amebiasis is frequently found without trophozoites or cysts in stool; patients may have a negative stool antigen result.
- Entamoeba histolytica are intestinal parasites that infect a half billion people worldwide annually. Of those infected, most are infected with the non-pathogenic E. dispar, which has not been associated with disease. It is estimated that approximately 10% of the half billion people infected each year are infected with the pathogenic E. histolytica. These individuals become symptomatic and develop colitis and liver abscesses.

CPT Codes:
- 873347-90

LOINC Codes:
- 29905-7
Enterovirus RNA
P365

ORDERING

Available Stat:
No
Performing Lab:
Viracor IBT
Methodology:
Real-time PCR
Reported:
2-5 days
Additional Information:
The enteroviruses are well-known etiologic agents of viral meningitis, viral encephalitis, myocarditis, and respiratory tract disease as well as a wide variety of other clinical conditions. Quantitative PCR can be used to detect the presence of the virus as well as track the course of infection. Detects the entire spectrum of human enteroviruses, including coxsackie A viruses, coxsackie B viruses, echoviruses, polioviruses, and enteroviruses 68 - 71. The assay does not differentiate between serotypes.

COLLECTION

Sample Type:
EDTA plasma, CSF, stool, tissue, nasopharyngeal swab
Collect:
Blood: Lavendar top tube, CSF: CSF tube; Stool, tissue: Sterile container; Nasopharyngeal swab: Flocked swab in Universal Transport Medium
Amount to Collect:
Blood: 2 mL, CSF: 1 mL; Stool: size of pea or 2 mL liquid stool; Tissue: 5 cu.mm
Preferred Volume:
Plasma, CSF: 1 mL; Stool: size of pea or 2 mL liquid stool; Tissue: 5 cu.mm
Minimum Volume:
Plasma, CSF: 0.5 mL; Stool: size of pea or 0.5 mL liquid; Tissue: 2 cu.mm
Stability (from collection to initiation):
CSF, stool, tissue: Frozen -70°C 1 month
Plasma, nasopharyngeal swab: Room temperature 4 days, frozen -70°C 1 month

PROCESSING

Test Code:
P365
Sendout:
Yes
Performing Lab:
Viracor IBT
Specimen Preparation:
Centrifuge blood at 1300 g for 10 minutes, and aliquot plasma. Freeze samples at -70°C. Viracor test code 1400; For sample types reported as Detected/Not detected (e.g. stool, tissue, nasopharyngeal swab), credit with retain results and bill manually.
Preferred Volume:
Plasma, CSF: 1 mL; Stool: size of pea or 2 mL liquid stool; Tissue: 5 cu.mm
Minimum Volume:
Plasma, CSF: 0.5 mL; Stool: size of pea or 0.5 mL liquid; Tissue: 2 cu.mm
Stability (from collection to initiation):
CSF, stool, tissue: Frozen -70°C 1 month
Plasma, nasopharyngeal swab: Room temperature 4 days, frozen -70°C 1 month
RESULT INTERPRETATION

Units:
- copies/mL for quantitative results

Reference Interval:
- Not Detected

Critical Values:
- Positive result for CSF

Additional Information:
The enteroviruses are well-known etiologic agents of viral meningitis, viral encephalitis, myocarditis, and respiratory tract disease as well as a wide variety of other clinical conditions. Quantitative PCR can be used to detect the presence of the virus as well as track the course of infection. Detects the entire spectrum of human enteroviruses, including coxsackie A viruses, coxsackie B viruses, echoviruses, polioviruses, and enteroviruses 68 - 71. The assay does not differentiate between serotypes.

ADMINISTRATIVE

CPT Codes:
- CSF, plasma: 87799-90, Stool, tissue, nasopharyngeal swab: 87498-90

LOINC Codes:
- 53256-4

COMPLETE VIEW

Available Stat:
- No

Test Code:
- P365

Performing Lab:
- Viracor IBT

Sendout:
- Yes

Methodology:
- Real-time PCR

Collect:
- Blood: Lavendar top tube, CSF: CSF tube; Stool, tissue: Sterile container; Nasopharyngeal swab: Flocked swab in Universal Transport Medium

Amount to Collect:
- Blood: 2 mL, CSF: 1 mL; Stool: size of pea or 2 mL liquid stool; Tissue: 5 cu.mm

Sample Type:
- EDTA plasma, CSF, stool, tissue, nasopharyngeal swab

Preferred Volume:
- Plasma, CSF: 1 mL; Stool: size of pea or 2 mL liquid stool; Tissue: 5 cu.mm

Minimum Volume:
- Plasma, CSF: 0.5 mL; Stool: size of pea or 0.5 mL liquid; Tissue: 2 cu.mm

Specimen Preparation:
- Centrifuge blood at 1300 g for 10 minutes, and aliquot plasma. Freeze samples at -70°C. Viracor test code 1400; For sample types reported as Detected/Not detected (e.g. stool, tissue, nasopharyngeal swab), credit with retain results and bill manually.

Units:
- copies/mL for quantitative results

Reference Interval:
- Not Detected

Critical Values:
- Positive result for CSF

Stability (from collection to initiation):
- CSF, stool, tissue: Frozen -70°C 1 month

Printed 06/07/19
Test information subject to change
Plasma, nasopharyngeal swab: Room temperature 4 days, frozen -70ºC 1 month

**Reported:**
- 2-5 days

**Additional Information:**
The enteroviruses are well-known etiologic agents of viral meningitis, viral encephalitis, myocarditis, and respiratory tract disease as well as a wide variety of other clinical conditions. Quantitative PCR can be used to detect the presence of the virus as well as track the course of infection. Detects the entire spectrum of human enteroviruses, including coxsackie A viruses, coxsackie B viruses, echoviruses, polioviruses, and enteroviruses 68 - 71. The assay does not differentiate between serotypes.

**CPT Codes:**
- CSF, plasma: 87799-90, Stool, tissue, nasopharyngeal swab: 87498-90

**LOINC Codes:**
- 53256-4
# Eosinophils, nasal smear

## MOLT

### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Microscopic examination/Wright's Stain</td>
</tr>
<tr>
<td>Reported:</td>
<td>4-72 hours</td>
</tr>
<tr>
<td>Additional Information:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screening test to aid in diagnosis of allergic rhinitis.</td>
</tr>
<tr>
<td>Synonyms:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hansel stain</td>
</tr>
<tr>
<td></td>
<td>Allergic rhinitis</td>
</tr>
</tbody>
</table>

### COLLECTION

| Sample Type: |
|             | 2 air-dried nasal smears |
| Collect:    |
|             | Slides in slide holder |
| Preferred Volume: |
|             | 2 air-dried nasal smears |
| Minimum Volume: |
|             | 1 air-dried nasal smears |
| Remarks:    |
|             | Smears should be made by the physician at the time of nasal swabbing. |

### PROCESSING

| Test Code: |
|           | MOLT |
| Test Group: |
|            | Eosinophils |
| Sendout:   |
|            | Yes |
| Performing Lab: |
|               | Quest |
| Preferred Volume: |
|             | 2 air-dried nasal smears |
| Minimum Volume: |
|             | 1 air-dried nasal smears |

### RESULT INTERPRETATION

| Reference Interval: |
|                    | <= 19% eosinophils |
| Additional Information: |
|                      | Screening test to aid in diagnosis of allergic rhinitis. |
CPT Codes:
89190-90
LOINC Codes:
9727-9

COMPLETE VIEW

Available Stat:
No
Test Code:
MOLT
Test Group:
Eosinophils
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Microscopic examination/Wright's Stain
Remarks:
Smears should be made by the physician at the time of nasal swabbing.
Collect:
Slides in slide holder
Sample Type:
2 air-dried nasal smears
Preferred Volume:
2 air-dried nasal smears
Minimum Volume:
1 air-dried nasal smears
Reference Interval:
<= 19% eosinophils
Synonyms:
• Hansel stain
• Allergic rhinitis
Reported:
4-72 hours
Additional Information:
Screening test to aid in diagnosis of allergic rhinitis.

CPT Codes:
89190-90
LOINC Codes:
9727-9
Eosinophils, sputum
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Microscopic Examination/Wright's stain
Reported:
3-72 hours
Additional Information:
Screening test to aid in diagnosis of asthma, bronchitis and some types of pneumonia.
Synonyms:
• Hansel stain

COLLECTION

Sample Type:
2 air-dried sputum smears
Collect:
Glass slides in slide holder
Preferred Volume:
2 air-dried sputum smears
Minimum Volume:
1 air-dried sputum smear
Remarks:
Smears should be made by the physician at the time of collection.

PROCESSING

Test Code:
MOLT
Test Group:
Eosinophils
Sendout:
Yes
Performing Lab:
Quest
Preferred Volume:
2 air-dried sputum smears
Minimum Volume:
1 air-dried sputum smear

RESULT INTERPRETATION

Reference Interval:
Not established
Additional Information:
Screening test to aid in diagnosis of asthma, bronchitis and some types of pneumonia.
**ADMINISTRATIVE**

CPT Codes:
- 85999-90

LOINC Codes:
- 10327-5

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- MOLT

Test Group:
- Eosinophils

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Microscopic Examination/Wright's stain

Remarks:
- Smears should be made by the physician at the time of collection.

Collect:
- Glass slides in slide holder

Sample Type:
- 2 air-dried sputum smears

Preferred Volume:
- 2 air-dried sputum smears

Minimum Volume:
- 1 air-dried sputum smear

Reference Interval:
- Not established

Synonyms:
- Hansel stain

Reported:
- 3-72 hours

Additional Information:
- Screening test to aid in diagnosis of asthma, bronchitis and some types of pneumonia.

CPT Codes:
- 85999-90

LOINC Codes:
- 10327-5
Eosinophils, urine
UEOS

ORDERING

Approval Required:
Requests restricted to renal service.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Test available 0800-2200 daily

Reported:
2 hours

Additional Information:
Not available at Mount Zion.

Synonyms:
- Hansel stain

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
See preferred volume

Preferred Volume:
10 mL urine

Remarks:
After urine sample is collected while it is still warm hand carry sample to Hematology Laboratory (Room M524) immediately. Inform the technologist that the urine sample is for Urine Eosinophils

Stability (from collection to initiation):
Eosinophils are very unstable in urine and rapidly degenerate. Samples must be hand carried to the Hematology Laboratory (Room M524) as soon as possible after collection while sample is still warm. Inform the technologist that the sample is for Urine Eosinophils

PROCESSING

Test Code:
UEOS

Test Group:
Eosinophils

Performing Lab:
Parnassus Hematology

Specimen Preparation:
Route immediately to Hematology after order entry.

Preferred Volume:
10 mL urine

Stability (from collection to initiation):
Eosinophils are very unstable in urine and rapidly degenerate. Samples must be hand carried to the Hematology Laboratory (Room M524) as soon as possible after collection while sample is still warm. Inform the technologist that the sample is for Urine Eosinophils

RESULT INTERPRETATION
Reference Interval:
Negative

Additional Information:
Not available at Mount Zion.

ADMINISTRATIVE

CPT Codes:
89051

LOINC Codes:
34557-9

COMPLETE VIEW

Approval Required:
Requests restricted to renal service.

Available Stat:
No

Test Code:
UEOS

Test Group:
Eosinophils

Performing Lab:
Parnassus Hematology

Performed:
Test available 0800-2200 daily

Remarks:
After urine sample is collected while it is still warm hand carry sample to Hematology Laboratory (Room M524) immediately. Inform the technologist that the urine sample is for Urine Eosinophils

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Specimen Preparation:
Route immediately to Hematology after order entry.

Reference Interval:
Negative

Synonyms:
• Hansel stain

Stability (from collection to initiation):
Eosinophils are very unstable in urine and rapidly degenerate. Samples must be hand carried to the Hematology Laboratory (Room M524) as soon as possible after collection while sample is still warm. Inform the technologist that the sample is for Urine Eosinophils

Reported:
2 hours

Additional Information:
Not available at Mount Zion.

CPT Codes:
89051

LOINC Codes:
34557-9
Epidemiology Culture, Air Sample

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Daily
Methodology: Culture
Reported: 5-8 days
Synonyms:
  - Bacterial culture
  - environmental culture

COLLECTION

Collect:
  Rose-Bengal Agar Strips
Remarks:
  Collection of air samples is performed by EH&S

PROCESSING

Test Code: P039
Performing Lab: Microbiology

Specimen Preparation:
1. Accession test code P039 using appropriate account number, based upon which department submitted samples: Infection Control air samples: MOP-1641/ Physician Code O135 Infection Control Adult Bone Marrow Transplant air samples: MOP-4 / Physician Code 43782 Leavitt, Andrew Clinical Labs Pedi Immunology air samples: MOP-4351/ Physician Code O137 Air Samples from other departments will need to have a new MOP account number auto generated, when accessioning.
2. Enter AIR in SDES and location of sampling in SREQ.
3. Place strips on mycology bench, at room temperature.

ADMINISTRATIVE

LOINC Codes:
  45335-7

COMPLETE VIEW

Available Stat: No
Test Code: P039
Performing Lab: Microbiology
Performed:
Daily

Methodology:
Culture

Remarks:
Collection of air samples is performed by EH&S

Collect:
Rose-Bengal Agar Strips

Specimen Preparation:
1. Accession test code P039 using appropriate account number, based upon which department submitted samples: Infection Control air samples: MOP-1641/ Physician Code O135 Infection Control Adult Bone Marrow Transplant air samples: MOP-4 / Physician Code 43782 Leavitt, Andrew Clinical Labs Pedi Immunology air samples: MOP-4351/ Physician Code O137 Air Samples from other departments will need to have a new MOP account number auto generated, when accessioning.
2. Enter AIR in SDES and location of sampling in SREQ.
3. Place strips on mycology bench, at room temperature.

Synonyms:
- Bacterial culture
- Environmental culture

Reported:
5-8 days

LOINC Codes:
45335-7
Epstein-Barr virus Antibodies

EBV

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:

The components of this battery test are IgM anti-VCA (Viral Capsid Antigen) and IgG anti-EBNA-1 (Epstein-Barr Nuclear Antigen-1). Each test member can also be ordered separately using test code VCAM (Viral Capsid Antigen IgM) or EBNA (Epstein-Barr Nuclear Antigen-1 IgG).

The presence of IgM anti-VCA antibodies is indicative of acute infection.

The presence of IgG anti-EBNA antibodies is indicative of prior exposure or infection with EBV.

The heterophile agglutination test is recommended for routine screening for acute infectious mononucleosis rather than this test. Results are reported as 'Positive', 'Negative', or 'Equivocal'.

Equivocal results may represent low-titer antibody in early infection; testing may be repeated, if clinically indicated. The so-called 'early' antibodies to EA/D and EA/R may or may not be present in acute or prior infection, while the titer of IgG anti-VCA is elevated in both acute and prior infection.

Since these antibodies offer no additional information, testing for these antibodies is not offered. EBV antibodies CANNOT be used to diagnose "chronic" or recurrent mononucleosis.

If initial tests are negative in acute illness, do not repeat for at least 3-4 weeks.

Synonyms:
- EBV
- anti-EA
- anti-EA/D
- Anti-EA/R
- Anti-early antigen
- anti-ebna
- anti-vca
- ea antibody
- ea/d antibody
- ea/r antibody
- early antigen
- ebna antibody
- IgM anti-VCA
- VCA antibody

COLLECTION

Printed 06/07/19
Test information subject to change
Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

PROCESSING

Test Code: EBV (VCAM and EBNA) - battery test
Please use VCAM or EBNA for individual test order
Test Group: EBV
Performing Lab: Immunology
Specimen Preparation: Freeze serum at -20C.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

RESULT INTERPRETATION

Reference Interval:
IgM anti-VCA: Neg
Anti-EBNA: Neg

Additional Information:
The components of this batterytest are IgM anti-VCA (Viral Capsid Antigen) and IgG anti-EBNA-1 (Epstein-Barr Nuclear Antigen-1). Each test member can also be ordered separately using test code VCAM (Viral Capsid Antigen IgM) or EBNA (Epstein-Barr Nuclear Antigen-1 IgG).

The presence of IgM anti-VCA antibodies is indicative of acute infection.

The presence of IgG anti-EBNA antibodies is indicative of prior exposure or infection with EBV.

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Since these antibodies offer no additional information, testing for these antibodies is not offered. EBV antibodies CANNOT be used to diagnose “chronic” or recurrent mononucleosis.

If initial tests are negative in acute illness, do not repeat for at least 3-4 weeks.

ADMINISTRATIVE

CPT Codes:
86665; 86664
LOINC Codes:
5156-5; 24115-8

COMPLETE VIEW

Available Stat:
No

Test Code:
EBV (VCAM and EBNA) - battery test
Please use VCAM or EBNA for individual test order

Test Group:
EBV

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze serum at -20C.

Reference Interval:
IgM anti-VCA: Neg
Anti-EBNA: Neg

Synonyms:
• EBV
• anti-EA
• anti-EA/D
• Anti-EA/R
• Anti-early antigen
• anti-ebna
• anti-vca
• ea antibody
• ea/d antibody
• ea/r antibody
• early antigen
• ebna antibody
• IgM anti-VCA
• VCA antibody

Reported:
1-4 days

Additional Information:
The components of this battery test are IgM anti-VCA (Viral Capsid Antigen) and IgG anti-EBNA-1 (Epstein-Barr Nuclear Antigen-1).
Each test member can also be ordered separately using test code VCAM (Viral Capsid Antigen IgM) or EBNA (Epstein-Barr Nuclear Antigen-1 IgG).

The presence of IgM anti-VCA antibodies is indicative of acute infection.

The presence of IgG anti-EBNA antibodies is indicative of prior exposure or infection with EBV.

The heterophile agglutination test is recommended for routine screening for acute infectious mononucleosis rather than this test. Results are reported as 'Positive', 'Negative', or Equivocal'.

Equivocal results may represent low-titer antibody in early infection; testing may be repeated, if clinically indicated. The so-called 'early' antibodies to EA/D and EA/R may or may not be present in acute or prior infection, while the titer of IgG anti-VCA is elevated in both acute and prior infection.

Since these antibodies offer no additional information, testing for these antibodies is not offered. EBV antibodies CANNOT be used to diagnose "chronic" or recurrent mononucleosis.

If initial tests are negative in acute illness, do not repeat for at least 3-4 weeks.

**CPT Codes:**
86665; 86664

**LOINC Codes:**
5156-5; 24115-8
**Epstein-Barr virus DNA, Quantitative, blood**

**EBVQT**

**ORDERING**

**Ordering Recommendations:**
- There is no indication for EBV testing on urine samples.

**Available Stat:**
- No

**Performing Lab:**
- Microbiology

**Performed:**
- Tuesday and Friday, day shift

**Methodology:**
- Real time PCR

**Reported:**
- 1-4 days

**Additional Information:**
- This assay uses real-time PCR methodology to amplify a segment of the LMP2 gene, and is capable of accurate detection and quantitation from 1000 to 1 x 10e6 copies/mL. If detected with less than 1000 copies/mL, results will be reported as “Detected, < 1000 copies/mL”. Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number. This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U. S. Food and Drug Administration.

This assay is most useful in identifying patients at risk for EBV lymphoproliferative diseases including post transplantation lymphoproliferative disease (PTLD) and certain lymphomas. Immunocompromised patients, including solid organ and hematopoietic stem cell transplant recipients and AIDS patients are at higher risk for clinical disease.

Studies suggest that rising copy numbers of EBV DNA in plasma indicate a risk of PTLD. In many of these patients, EBV DNA titers rise progressively, even before clinical evidence of disease. Rarely, patients with clinical EBV disease have DNA titers that are undetectable or below 1,000 copies/ml of plasma. This assay can also be used to monitor the efficacy of efforts designed to lower EBV levels.

No interference in assay performance was demonstrated in studies conducted on blood specimens containing CMV, HSV, or VZV.

**References:**
- Perandin F et al. (2007) Comparison of commercial and in-house real-time PCR assays for quantification of Epstein-Barr virus (EBV) DNA in plasma. BMC Microbiology 7:22.

**Synonyms:**
- EBV PCR

**COLLECTION**

**Sample Type:**
- EDTA plasma

**Collect:**
- Lavender top 6 mL size

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Remarks:**
- Avoid hemolysis.
Stability (from collection to initiation):
  Room temperature up to 6 hours for whole blood; plasma frozen at -70ºC for 1 month

Unacceptable Conditions:
  Collected in heparin tube, gross hemolysis.

PROCESSING

Test Code:
  EBVQT

Test Group:
  EBV

Performing Lab:
  Microbiology

Specimen Preparation:
  Separate plasma from cells and freeze at -70C within 6 hours of collection.

Preferred Volume:
  2 mL plasma

Minimum Volume:
  1 mL plasma

Unacceptable Conditions:
  Collected in heparin tube, gross hemolysis.

Stability (from collection to initiation):
  Room temperature up to 6 hours for whole blood; plasma frozen at -70ºC for 1 month

RESULT INTERPRETATION

Units:
  copies/mL

Reference Interval:
  Not detected

Additional Information:
  This assay uses real-time PCR methodology to amplify a segment of the LMP2 gene, and is capable of accurate detection and quantitation from 1000 to 1 x 10^6 copies/mL. If detected with less than 1000 copies/mL, results will be reported as "Detected, < 1000 copies/mL". Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number. This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U. S. Food and Drug Administration.

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  Studies suggest that rising copy numbers of EBV DNA in plasma indicate a risk of PTLD. In many of these patients, EBV DNA titers rise progressively, even before clinical evidence of disease. Rarely, patients with clinical EBV disease have DNA titers that are undetectable or below 1,000 copies/ml of plasma. This assay can also be used to monitor the efficacy of efforts designed to lower EBV levels.

  No interference in assay performance was demonstrated in studies conducted on blood specimens containing CMV, HSV, or VZV.

References:
  Perandin F et al. (2007) Comparison of commercial and in-house real-time PCR assays for quantification of Epstein-Barr virus (EBV) DNA in plasma. BMC Microbiology 7:22.

ADMINISTRATIVE

CPT Codes:
  87799
LDT or Modified FDA: Yes
LOINC Codes:
36923-1

COMPLETE VIEW

Available Stat: No
Ordering Recommendations: There is no indication for EBV testing on urine samples.
Test Code: EBVQT
Test Group: EBV
Performing Lab: Microbiology
Performed: Tuesday and Friday, day shift
Methodology: Real time PCR
Remarks: Avoid hemolysis.
Collect: Lavender top 6 mL size
Amount to Collect: 4 mL blood
Sample Type: EDTA plasma
Preferred Volume: 2 mL plasma
Minimum Volume: 1 mL plasma
Unacceptable Conditions: Collected in heparin tube, gross hemolysis.
Specimen Preparation: Separate plasma from cells and freeze at -70ºC within 6 hours of collection.
Units: copies/mL
Reference Interval: Not detected
Synonyms: EBV PCR
Stability (from collection to initiation): Room temperature up to 6 hours for whole blood; plasma frozen at -70ºC for 1 month
Reported: 1-4 days
Additional Information: This assay uses real-time PCR methodology to amplify a segment of the LMP2 gene, and is capable of accurate detection and quantitation from 1000 to 1 x 10e6 copies/mL. If detected with less than 1000 copies/mL, results will be reported as “Detected, < 1000 copies/mL”. Change in virus DNA level over time is a better indicator of clinical significance than absolute copy number. This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U. S. Food and Drug Administration.

This assay is most useful in identifying patients at risk for EBV lymphoproliferative diseases including post transplantation lymphoproliferative disease (PTLD) and certain lymphomas. Immunocompromised patients, including solid organ and hematopoietic
stem cell transplant recipients and AIDS patients are at higher risk for clinical disease.

Studies suggest that rising copy numbers of EBV DNA in plasma indicate a risk of PTLD. In many of these patients, EBV DNA titers rise progressively, even before clinical evidence of disease. Rarely, patients with clinical EBV disease have DNA titers that are undetectable or below 1,000 copies/ml of plasma. This assay can also be used to monitor the efficacy of efforts designed to lower EBV levels.

No interference in assay performance was demonstrated in studies conducted on blood specimens containing CMV, HSV, or VZV.

References:
Perandin F et al. (2007) Comparison of commercial and in-house real-time PCR assays for quantification of Epstein-Barr virus (EBV) DNA in plasma. BMC Microbiology 7:22.

CPT Codes:
87799

LDT or Modified FDA:
Yes

LOINC Codes:
36923-1
Epstein-Barr virus DNA, Quantitative, non-plasma samples
EBVMIS

ORDERING

Ordering Recommendations:
There is no indication for EBV testing on urine samples.
Available Stat:
No
Performing Lab:
Viracor
Methodology:
RTPCR
Synonyms:
- EBV PCR

COLLECTION

Sample Type:
CSF, bone marrow, unfixed tissue, BAL
Collect:
CSF tube or sterile collection tube, EDTA Tube, Black top tube, other sterile screw top container
Minimum Volume:
Fluid samples: 2 mL
Fresh Tissue: 5 mg (Pencil eraser size)
Unacceptable Conditions:
Improperly submitted samples

PROCESSING

Test Code:
EBVMIS
Test Group:
EBV
Sendout:
Yes
Performing Lab:
Viracor
Specimen Preparation:
Freeze samples and ship frozen to China Basin. Ship on dry ice to Viracor.
Minimum Volume:
Fluid samples: 2 mL
Fresh Tissue: 5 mg (Pencil eraser size)
Unacceptable Conditions:
Improperly submitted samples

RESULT INTERPRETATION

Units:
IU/mL
Reference Interval:
Not detected
CPT Codes:
87799-90

Complete View

Available Stat:
No

Ordering Recommendations:
There is no indication for EBV testing on urine samples.

Test Code:
EBVMIS

Test Group:
EBV

Performing Lab:
Viracor

Sendout:
Yes

Methodology:
RT-PCR

Collect:
CSF tube or sterile collection tube, EDTA Tube, Black top tube, other sterile screw top container

Sample Type:
CSF, bone marrow, unfixed tissue, BAL

Minimum Volume:
Fluid samples: 2 mL
Fresh tissue: 5 mg (Pencil eraser size)

Unacceptable Conditions:
Improperly submitted samples

Specimen Preparation:
Freeze samples and ship frozen to China Basin. Ship on dry ice to Viracor.

Units:
IU/mL

Reference Interval:
Not detected

Synonyms:
• EBV PCR

CPT Codes:
87799-90

Test Information subject to change
Erythrocyte Porphyrin (EP), Whole Blood
EPWB

ORDERING

Ordering Recommendations:
Screen for erythropoietic protoporphyria (EPP) in patients with cutaneous photosensitivity.

Performing Lab:
ARUP

Performed:
Mon, Wed, Sat

Methodology:
Fluorometry

Reported:
1-4 days

Synonyms:
- FEP
- Free Erythrocyte Porphyrin
- Porphyrins (FEP)
- Protoporphyrin, Free Erythrocyte (FEP)
- Protoporphyrins, Total, Erythrocytes
- RBC Porphyrins
- Red Blood Cell Porphyrins

COLLECTION

Collect:
Royal blue (EDTA), lavender (EDTA), pink (K₂EDTA), or Tan (K₂EDTA). Use royal blue tube when also testing for lead.

Remarks:
Specimen should be tested for lead FIRST to avoid potential contamination problems. Specimens not protected from light acceptable with a disclaimer.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 2 weeks; Frozen: 1 month

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Specimens not collected in EDTA. Clotted specimens.

PROCESSING

Test Code:
EPWB

ARUP Test Code:
0020610

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Protect from light during collection, storage, and shipment. Transfer 1 mL whole blood to an ARUP Amber Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:
Specimens not collected in EDTA. Clotted specimens.

**Stability (from collection to initiation):**
- Ambient: Unacceptable; Refrigerated: 2 weeks; Frozen: 1 month

**Storage/Transport Temperature:**
- Refrigerated.

### RESULT INTERPRETATION

**Reference Interval:**
- 0-35 µg/dL

### ADMINISTRATIVE

**CPT Codes:**
- 84202

### COMPLETE VIEW

**Ordering Recommendations:**
- Screen for erythropoietic protoporphyria (EPP) in patients with cutaneous photosensitivity.

**Test Code:**
- EPWB

**ARUP Test Code:**
- 0020610

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon, Wed, Sat

**Methodology:**
- Fluorometry

**Remarks:**
- Specimen should be tested for lead FIRST to avoid potential contamination problems. Specimens not protected from light acceptable with a disclaimer.

**Collect:**
- Royal blue (EDTA), lavender (EDTA), pink (K$_2$EDTA), or Tan (K$_2$EDTA). Use royal blue tube when also testing for lead.

**Unacceptable Conditions:**
- Specimens not collected in EDTA. Clotted specimens.

**Specimen Preparation:**
- Protect from light during collection, storage, and shipment. Transfer 1 mL whole blood to an ARUP Amber Transport Tube. (Min: 0.5 mL)

**Reference Interval:**
- 0-35 µg/dL

**Synonyms:**
- FEP
- Free Erythrocyte Porphyrin
- Porphyrins (FEP)
- Protoporphyrin, Free Erythrocyte (FEP)
- Protoporphyrins, Total, Erythrocytes
- RBC Porphyrins
- Red Blood Cell Porphyrins

**Storage/Transport Temperature:**
- Refrigerated.
Refrigerated.

**Stability (from collection to initiation):**
- Ambient: Unacceptable; Refrigerated: 2 weeks; Frozen: 1 month

**Reported:**
- 1-4 days

**CPT Codes:**
- 84202

**Notes:**
Elevated EP results are seen in early and late iron deficiency, in the anemia of chronic disease, and in chronic lead poisoning (typically when blood lead is greater than 25 µg/dL). Elevated protoporphyrin (as in erythropoietic protoporphyria) and zinc coproporphyrin (usually associated with childbirth) can increase the apparent EP signal. A more specific test for free protoporphyrin is Porphyrins, Serum Total (0080429). Specimens which are hemolyzed, clotted, or improperly aliquoted may show false elevations.
Erythropoietin

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Immunoassay
Reported: Test performed 3x per week. Turnaround time: 2-5 days.
Additional Information: The Erythropoietin reference range is based on individuals with normal hemoglobin and hematocrit values.
Synonyms:
• Epo
• EPO
• Epogen

COLLECTION

Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 2 months
Unacceptable Conditions: Gross hemolysis
Rejection Criteria: Gross hemolysis

PROCESSING

Test Code: ERP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Centrifuge clotted sample and freeze serum at -20°C. Order Quest Nichols test # 427.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Unacceptable Conditions:
- Gross hemolysis

Rejection Criteria:
- Gross hemolysis

Stability (from collection to initiation):
- Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 2 months

RESULT INTERPRETATION

Units:
- mIU/mL

Reference Interval:
- Pediatric:
  - 3 weeks-2 months: 5.0-13.0 mIU/mL
  - 3 months-16 years: 9.0-28.0 mIU/mL
- >= 18 years: 4.1-19.5 mIU/mL

Additional Information:
- The Erythropoietin reference range is based on individuals with normal hemoglobin and hematocrit values.

ADMINISTRATIVE

CPT Codes:
- 82668-90

LOINC Codes:
- 15061-5

COMPLETE VIEW

Available Stat:
- No

Test Code:
- ERP

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Immunoassay

Collect:
- Gold top or Red top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Rejection Criteria:
- Gross hemolysis

Unacceptable Conditions:
- Gross hemolysis

Specimen Preparation:
- Centrifuge clotted sample and freeze serum at -20C. Order Quest Nichols test # 427.
Units:
mIU/mL

Reference Interval:
Pediatric:
3 weeks-2 months: 5.0-13.0 mIU/mL
3 months-16 years: 9.0-28.0 mIU/mL

>= 18 years: 4.1-19.5 mIU/mL

Synonyms:
- Epo
- EPO
- Epogen

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 2 months

Reported:
Test performed 3x per week. Turnaround time: 2-5 days.

Additional Information:
The Erythropoietin reference range is based on individuals with normal hemoglobin and hematocrit values.

CPT Codes:
82668-90

LOINC Codes:
15061-5
Estradiol, Ultrasensitive
E2U

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Set up Monday, Tuesday and Thursday, reports next day.
Methodology: Liquid chromatography-tandem mass spectrometry (LC-MS/MS)
Reported: 1-7 days
Additional Information: To convert pg/mL to pmol/L (SI units) multiply by 3.67.
Synonyms:
- E2
- ER
- ERA
- PR
- PRA

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 1 mL blood
Preferred Volume: 0.6 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Room Temperature 2 days, refrigerated 1 week, frozen at -20C 2 years.

PROCESSING

Test Code: E2U
Performing Lab: China Basin Chemistry
Specimen Preparation: Centrifuge and aliquot immediately. Send refrigerated to China Basin.
Preferred Volume: 0.6 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Room Temperature 2 days, refrigerated 1 week, frozen at -20C 2 years.
RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:
Adult Males (>=18 years old): 10-42 pg/mL

Adult Females (>=18 years old):

<table>
<thead>
<tr>
<th>Stage</th>
<th>Males (pg/mL)</th>
<th>Females (pg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follicular Stage</td>
<td>39-375 pg/mL</td>
<td></td>
</tr>
<tr>
<td>Luteal Stage</td>
<td>48-440 pg/mL</td>
<td></td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>&lt;11 pg/mL</td>
<td></td>
</tr>
</tbody>
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Pediatric:

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Males (pg/mL)</th>
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</tr>
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<tbody>
<tr>
<td>7-9</td>
<td>&lt;7</td>
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<th>Tanner Stage</th>
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<tr>
<td>I</td>
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</tr>
<tr>
<td>IV and V</td>
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Adult male and pediatric reference ranges adapted from ARUP Laboratories (Am J Clin Pathol 2008; 129:530-539) based on patient correlation studies comparing this LC-MS/MS method with the ARUP method and by in-house testing of 20 normal male volunteers in UCSF Clinical Laboratories. Adult female reference ranges adapted from Quest Diagnostics and by in-house testing of 20 normal female volunteers in UCSF Clinical Laboratories.

Additional Information:
To convert pg/mL to pmol/L (SI units) multiply by 3.67.

ADMINISTRATIVE

CPT Codes:
82670

LOINC Codes:
2243-4

COMPLETE VIEW

Available Stat:
No

Test Code:
E2U

Performing Lab:
China Basin Chemistry

Performed:
Set up Monday, Tuesday and Thursday, reports next day.

Methodology:
Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

Collect:
Red top

Amount to Collect:
1 mL blood
Sample Type:
Serum

Preferred Volume:
0.6 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Centrifuge and aliquot immediately. Send refrigerated to China Basin.

Units:
pg/mL

Reference Interval:
Adult Males (>=18 years old): 10-42 pg/mL

Adult Females (>=18 years old):

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Synonyms:
- E2
- ER
- ERA
- PR
- PRA

Stability (from collection to initiation):
Room Temperature 2 days, refrigerated 1 week, frozen at -20C 2 years.

Reported:
1-7 days

Additional Information:
To convert pg/mL to pmol/L (SI units) multiply by 3.67.

CPT Codes:
82670

LOINC Codes:
2243-4
Estrone, serum
E1P

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
LC/MS/MS

**Reported:**
Test run Tuesday-Saturday. Turnaround time: 3-6 days

**Additional Information:**
To convert ng/L to pmol/L (SI units) multiply by 3.70.

**Synonyms:**
- ER
- ERA
- PR
- PRA
- E1

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top (Gold top **NOT** acceptable)

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.3 mL serum

**Remarks:**
Specify patients age and sex on the request slip.

**Unacceptable Conditions:**
Collected in Gold top.

**PROCESSING**

**Test Code:**
E1P

**Test Group:**
Estrone

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Refrigerate. Specify age and sex on request slip. Order Quest # 23244 For B&T patients order LabCorp #004564

**Preferred Volume:**
0.5 mL serum
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Collected in Gold top.

RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:

Pediatric Females:
Prepubertal 1-9 years <= 34 pg/mL
10-11 years <= 72 pg/mL
12-14 years <= 75 pg/mL
15-17 years <= 188 pg/mL

Pediatric Males:
Prepubertal 1-9 years <10 pg/mL
10-11 years <= 12 pg/mL
12-14 years <= 28 pg/mL
15-17 years <= 64 pg/mL

Post-pubertal Female:
Follicular Stage 10-138 pg/mL
Mid-cycle Stage 49-268 pg/mL
Luteal Stage 16-173 pg/mL
Post-Menopausal female <= 65 pg/mL
>= 18 year old male <= 68 pg/mL

Additional Information:
To convert ng/L to pmol/L (SI units) multiply by 3.70.

ADMINISTRATIVE

CPT Codes:
82679-90

LOINC Codes:
2258-2
Available Stat: No
Test Code: E1P
Test Group: Estrone
Performing Lab: Quest
Sendout: Yes
Methodology: LC/MS/MS
Remarks: Specify patients age and sex on the request slip.
Collect: Red top (Gold top NOT acceptable)
Amount to Collect: 1 mL blood
Sample Type: Serum
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Collected in Gold top.
Specimen Preparation: Refrigerate. Specify age and sex on request slip. Order Quest # 23244 For B&T patients order LabCorp #004564
Units: pg/mL
Reference Interval:

Pediatric Females:
Prepubertal 1-9 years <= 34 pg/mL
10-11 years <= 72 pg/mL
12-14 years <= 75 pg/mL
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Pediatric Males:
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Post-Menopausal female <= 65 pg/mL
>= 18 year old male <= 68 pg/mL

Synonyms:
- ER
- ERA
- PR
- PRA
- E1

Reported:
Test run Tuesday-Saturday. Turnaround time: 3-6 days

Additional Information:
To convert ng/L to pmol/L (SI units) multiply by 3.70.

CPT Codes:
82679-90

LOINC Codes:
2258-2
Ethanol, Plasma / Serum

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic Rate Method (Beckman DxC800)
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
To convert g/dL to mmol/L (SI units) multiply by 217.

See also entries for Drug Screens.

Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum. An osmolar gap (normally < 10) which is greater than explainable by ethanol (or other underlying medical conditions, such as chronic renal failure, diabetic ketoacidosis or underestimation of sodium due to hyperlipidemia) suggests the possibility of ingestion of additional toxins such as methanol or ethylene glycol.

Our assay employing separated serum or plasma gives values 10-35% higher than those used forensically on whole blood. A plasma level of 0.09-0.11 g/dL approximates the whole blood level of >= 0.08 g/dL which legally defines intoxication. If there is reason to suspect that the ethanol level may have legal implications, the time of collection, the venipuncture site, the presence and site of any intravenous infusions, and the name of the phlebotomist should be recorded in the chart and on the requisition.

Please note: elevated lactic acid concentrations and elevated lactate dehydrogenase activity may cause a slightly falsely elevated ethanol concentration.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration tested</th>
<th>Observed effect on ethanol concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactic acid</td>
<td>14 mmol/L</td>
<td>+0.004 g/dL</td>
</tr>
<tr>
<td>Lactate dehydrogenase</td>
<td>1890 U/L</td>
<td>+0.004 g/dL</td>
</tr>
</tbody>
</table>

Synonyms:
- Alcohol
- Ethyl alcohol
- etoh

COLLECTION

Sample Type: Plasma or serum
Collect: Gold top preferred, Light Green or Gray top acceptable
Amount to Collect: 5 mL blood
Preferred Volume: Full vacutainer
Remarks: Do NOT disinfect the skin with alcohol when collecting the specimen, nor collect the sample above a running iv. See also entries for Drug Screens.
Stability (from collection to initiation): Run immediately after uncapping tube.
Unacceptable Conditions:
Partially filled tubes are acceptable only if brought promptly to the laboratory for stat assay.

PROCESSING

Test Code:
ALC

Test Group:
Ethanol

Performing Lab:
Parnassus & Mission Bay Chemistry

Specimen Preparation:
Do not open the tubes until loading the instrument.

Preferred Volume:
Full vacutainer

Unacceptable Conditions:
Partially filled tubes are acceptable only if brought promptly to the laboratory for stat assay.

Stability (from collection to initiation):
Run immediately after uncapping tube.

RESULT INTERPRETATION

Units:
g/dL

Reference Interval:
Negative < 0.005 g/dL

Additional Information:
To convert g/dL to mmol/L (SI units) multiply by 217.

See also entries for Drug Screens.

Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum. An osmolar gap (normally < 10) which is greater than explainable by ethanol (or other underlying medical conditions, such as chronic renal failure, diabetic ketoacidosis or underestimation of sodium due to hyperlipidemia) suggests the possibility of ingestion of additional toxins such as methanol or ethylene glycol.

Our assay employing separated serum or plasma gives values 10-35% higher than those used forensically on whole blood. A plasma level of 0.09-0.11 g/dL approximates the whole blood level of >= 0.08 g/dL which legally defines intoxication. If there is reason to suspect that the ethanol level may have legal implications, the time of collection, the venipuncture site, the presence and site of any intravenous infusions, and the name of the phlebotomist should be recorded in the chart and on the requisition.

Please note: elevated lactic acid concentrations and elevated lactate dehydrogenase activity may cause a slightly falsely elevated ethanol concentration.

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</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
80320

LOINC Codes:
5643-2

COMPLETE VIEW
Available Stat: Yes
Test Code: ALC
Test Group: Ethanol
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic Rate Method (Beckman DxC800)
Remarks: Do NOT disinfect the skin with alcohol when collecting the specimen, nor collect the sample above a running iv. See also entries for Drug Screens.
Collect: Gold top preferred, Light Green or Gray top acceptable
Amount to Collect: 5 mL blood
Sample Type: Plasma or serum
Preferred Volume: Full vacutainer
Unacceptable Conditions: Partially filled tubes are acceptable only if brought promptly to the laboratory for stat assay.
Specimen Preparation: Do not open the tubes until loading the instrument.
Units: g/dL
Reference Interval: Negative < 0.005 g/dL
Synonyms: Alcohol, Ethyl alcohol, etoh
Stability (from collection to initiation): Run immediately after uncapping tube.
Reported: STAT 1 hour, Routine 4 hours
Additional Information: To convert g/dL to mmol/L (SI units) multiply by 217.

Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum. An osmolar gap (normally < 10) which is greater than explainable by ethanol (or other underlying medical conditions, such as chronic renal failure, diabetic ketoacidosis or underestimation of sodium due to hyperlipidemia) suggests the possibility of ingestion of additional toxins such as methanol or ethylene glycol.

Our assay employing separated serum or plasma gives values 10-35% higher than those used forensically on whole blood. A plasma level of 0.09-0.11 g/dL approximates the whole blood level of >= 0.08 g/dL which legally defines intoxication. If there is reason to suspect that the ethanol level may have legal implications, the time of collection, the venipuncture site, the presence and site of any intravenous infusions, and the name of the phlebotomist should be recorded in the chart and on the requisition.

Please note: elevated lactic acid concentrations and elevated lactate dehydrogenase activity may cause a slightly falsely elevated ethanol concentration.
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</table>

CPT Codes: 80320

LOINC Codes: 5643-2
Ethanol, Urine
ALCO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay. Positive results confirmed by Gas chromatography
Reported:
Test run Monday-Saturday. Turnaround 3-4 days
Synonyms:
- Alcohol
- Ethyl alcohol
- etoh

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 7 days, frozen at -20C 30 days.

PROCESSING

Test Code:
ALCO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze sample at -20C. Order Quest # 2128X.
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 7 days, frozen at -20C 30 days.

RESULT INTERPRETATION

Units:
g/dL
Reference Interval:
Not detected

ADMINISTRATIVE

CPT Codes:
80101-90

LOINC Codes:
5645-7

COMPLETE VIEW

Available Stat:
No

Test Code:
ALCO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoassay. Positive results confirmed by Gas chromatography

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Freeze sample at -20C. Order Quest # 2128X.

Units:
g/dL

Reference Interval:
Not detected

Synonyms:
- Alcohol
- Ethyl alcohol
- etoh

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 7 days, frozen at -20C 30 days.

Reported:
Test run Monday-Saturday. Turnaround 3-4 days

CPT Codes:
80101-90

LOINC Codes:
5645-7
Ethosuximide
ETHO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
FPIA
Reported:
Set up 6x per week. Turnaround 3-4 days
Additional Information:
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
Synonyms:
- Zarontin

COLLECTION

Sample Type:
Serum (Plasma acceptable)
Collect:
Red top (Lavender acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Remarks:
Time to steady state: 4-7 days Do NOT use a serum separator tube (Gold top) to collect the specimen. Indicate the time of draw on the requisition. Optimum time for sample collection 4 hours post oral dose.
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks, frozen at -20°C 1 month
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
ETHO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze separated serum. Order Quest # 36160P.
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Unacceptable Conditions:
Collected in Gold top
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks, frozen at -20°C 1 month

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Therapeutic: 40-100 mg/L
Potentially toxic: > 150 mg/L

Critical Values:
UCSF: > 200 mg/L
Quest Priority-1: >= 150 mg/L

Additional Information:
See the lab manual’s "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80168-90

LOINC Codes:
3616-0

COMPLETE VIEW

Available Stat:
No

Test Code:
ETHO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
FPIA

Remarks:
Time to steady state: 4-7 days Do NOT use a serum separator tube (Gold top) to collect the specimen. Indicate the time of draw on the requisition. Optimum time for sample collection 4 hours post oral dose.

Collect:
Red top (Lavender acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum (Plasma acceptable)

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Freeze separated serum. Order Quest # 36160P.

Units:
mg/L

Reference Interval:
Therapeutic: 40-100 mg/L
Potentially toxic: > 150 mg/L

Critical Values:
  UCSF: > 200 mg/L
  Quest Priority-1: >= 150 mg/L

Synonyms:
  • Zarontin

Stability (from collection to initiation):
  Room temperature 4 days, refrigerated 2 weeks, frozen at -20C 1 month

Reported:
  Set up 6x per week. Turnaround 3-4 days

Additional Information:
  See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
  80168-90

LOINC Codes:
  3616-0
Ethyl glucuronide with confirmation
EGESC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Test set up 3x per week. Turnaround 5-7 days.
Additional Information:
Both ethyl glucuronide and ethyl sulfate are new markers for detecting recent alcohol consumption. Both are minor ethanol metabolites formed by uridine diphosphate-glucuronosyltransferase and sulfotransferase, respectively, and are excreted in urine for a longer time than ethanol. Positive results thus provide a strong indication that the person has recently consumed alcohol, even when ethanol is no longer detectable.
Synonyms:
- Alcoholism
- etohism
- alcohol metabolites
- ethanol metabolites

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Remarks:
Avoid contact with ethanol, disinfectants, swabs.
Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen 1 month.

PROCESSING

Test Code:
EGESC
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample. Order Quest test # 90418.
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen 1 month.

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
Ethyl glucuronide: < 500 ng/mL
Ethyl sulfate: < 100 ng/mL

Additional Information:
Both ethyl glucuronide and ethyl sulfate are new markers for detecting recent alcohol consumption. Both are minor ethanol metabolites formed by uridine diphosphate-glucuronosyltransferase and sulfotransferase, respectively, and are excreted in urine for a longer time than ethanol. Positive results thus provide a strong indication that the person has recently consumed alcohol, even when ethanol is no longer detectable.

ADMINISTRATIVE

CPT Codes:
83789-90

COMPLETE VIEW

Available Stat:
No

Test Code:
EGESC

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Remarks:
Avoid contact with ethanol, disinfectants, swabs.

Collect:
Urine cup

Amount to Collect:
20 mL urine

Sample Type:
Random urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Specimen Preparation:
Refrigerate sample. Order Quest test # 90418.

Units:
ng/mL

Reference Interval:
Ethyl glucuronide: < 500 ng/mL
Ethyl sulfate: < 100 ng/mL

Synonyms:
• Alcoholism
• etohism
• alcohol metabolites
• ethanol metabolites

**Stability (from collection to initiation):**
Room temperature or refrigerated 1 week, frozen 1 month.

**Reported:**
Test set up 3x per week. Turnaround 5-7 days.

**Additional Information:**
Both ethyl glucuronide and ethyl sulfate are new markers for detecting recent alcohol consumption. Both are minor ethanol metabolites formed by uridine diphosphate-glucuronosyltransferase and sulfotransferase, respectively, and are excreted in urine for a longer time than ethanol. Positive results thus provide a strong indication that the person has recently consumed alcohol, even when ethanol is no longer detectable.

**CPT Codes:**
83789-90
Ethylene Glycol

ORDERING

Ordering Recommendations:
Aid in assessment of the etiology of anion gap acidosis. Determine whether ethylene glycol poisoning exists.

Performed:
Sun-Sat

Methodology:
Quantitative Enzymatic

Reported:
1-4 days

Synonyms:
- Antifreeze
- Ethane-1, 2-Diol

COLLECTION

Patient Preparation:
Timing of specimen collection: Dependent on time of exposure - test upon presentation to hospital.

Collect:
Plain red. Also acceptable: Lavender (K₂ or K₃EDTA) or pink (K₂EDTA).

Stability (from collection to initiation):
After separation from cells: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Whole blood. Gel separator tubes, light blue (citrate), or yellow (SPS or ACD solution).

PROCESSING

Test Code:
ETGL

ARUP Test Code:
0090110

Specimen Preparation:
Separate serum or plasma from cells within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:
Whole blood. Gel separator tubes, light blue (citrate), or yellow (SPS or ACD solution).

Stability (from collection to initiation):
After separation from cells: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
Effective February 19, 2013

<table>
<thead>
<tr>
<th>Therapeutic Range</th>
<th>No therapeutic range - Limit of detection 5 mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxic Level</td>
<td>Greater than 20 mg/dL</td>
</tr>
</tbody>
</table>
Interpretive Data:
Toxic concentrations may cause intoxication, CNS depression, metabolic acidosis, renal damage and hypocalcemia. Ethylene glycol is extremely toxic. Ingestion can be fatal if patients do not receive immediate medical treatment.

CPT Codes:
82693

COMPLETE VIEW

Ordering Recommendations:
Aid in assessment of the etiology of anion gap acidosis. Determine whether ethylene glycol poisoning exists.

Test Code:
ETGL

ARUP Test Code:
0090110

Performed:
Sun-Sat

Methodology:
Quantitative Enzymatic

Patient Preparation:
Timing of specimen collection: Dependent on time of exposure - test upon presentation to hospital.

Collect:
Plain red. Also acceptable: Lavender (K₂ or K₃EDTA) or pink (K₂EDTA).

Unacceptable Conditions:
Whole blood. Gel separator tubes, light blue (citrate), or yellow (SPS or ACD solution).

Specimen Preparation:
Separate serum or plasma from cells within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Reference Interval:
Effective February 19, 2013

<table>
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<tbody>
<tr>
<td>Toxic Level</td>
<td>Greater than 20 mg/dL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Toxic concentrations may cause intoxication, CNS depression, metabolic acidosis, renal damage and hypocalcemia. Ethylene glycol is extremely toxic. Ingestion can be fatal if patients do not receive immediate medical treatment.

Synonyms:
- Antifreeze
- Ethane-1, 2-Diol

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month

Reported:
1-4 days

CPT Codes:
82693
**Everolimus**

**EVER**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
China Basin Chemistry

**Performed:**
Daily, day shift only

**Methodology:**
Abbott Architect chemiluminescent immunoassay

**Reported:**
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

**Additional Information:**
This everolimus immunoassay has SIGNIFICANT cross-reactivity with sirolimus. If a patient is on both everolimus and sirolimus, DO NOT order this everolimus immunoassay. Please order a “miscellaneous outside lab test” and write “ARUP everolimus mass spec assay” in the notes section.

**NOTE:** If patient is taking everolimus AND sirolimus, this immunoassay should not be run to determine the everolimus concentration of the sample. The clinicians should order a MOLT with “ARUP everolimus mass spec assay” written in the notes section. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

**Synonyms:**
- Afinitor
- Certican
- Zortress

### COLLECTION

**Sample Type:**
EDTA whole blood

**Collect:**
Lavender top

**Amount to Collect:**
3 mL blood

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
1 mL blood

**Remarks:**
Trough levels should be collected just before next dose.

**NOTE:** If patient is taking everolimus AND sirolimus, this immunoassay should not be run to determine the everolimus concentration of the sample. The clinicians should order a MOLT with “ARUP everolimus mass spec assay” written in the notes section. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

**Stability (from collection to initiation):**
Refrigerated 3 days, frozen 28 days.

**Unacceptable Conditions:**
Non-EDTA whole blood samples

### PROCESSING

**Test Code:**
EVER
Performing Lab:
- China Basin Chemistry

Specimen Preparation:
- Refrigerate sample.

**NOTE:** If MOLT order for "ARUP everolimus mass spec assay" is received. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

**Preferred Volume:**
- 3 mL blood

**Minimum Volume:**
- 1 mL blood

**Unacceptable Conditions:**
- Non-EDTA whole blood samples

**Stability (from collection to initiation):**
- Refrigerated 3 days, frozen 28 days.

---

**RESULT INTERPRETATION**

**Units:**
- ng/mL

**Reference Interval:**
- Therapeutic: 3-8 ng/mL
- Potentially toxic: > 12 ng/mL

Note: this therapeutic range is based upon use of everolimus in adult patients to prevent rejection after receiving a kidney transplant. The therapeutic range for the use of everolimus in other indications has not yet been established and may vary from the range documented here.


**Additional Information:**
- This everolimus immunoassay has SIGNIFICANT cross-reactivity with sirolimus. If a patient is on both everolimus and sirolimus, DO NOT order this everolimus immunoassay. Please order a “miscellaneous outside lab test” and write “ARUP everolimus mass spec assay” in the notes section

**NOTE:** If patient is taking everolimus AND sirolimus, this immunoassay should not be run to determine the everolimus concentration of the sample. The clinicians should order a MOLT with "ARUP everolimus mass spec assay" written in the notes section. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

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**ADMINISTRATIVE**

**CPT Codes:**
- 80299

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**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- EVER

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Daily, day shift only

**Methodology:**
- Abbott Architect chemiluminescent immunoassay
Remarks:
Trough levels should be collected just before next dose.

NOTE: If patient is taking everolimus AND sirolimus, this immunoassay should not be run to determine the everolimus concentration of the sample. The clinicians should order a MOLT with “ARUP everolimus”

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Non-EDTA whole blood samples

Specimen Preparation:
Refrigerate sample.

NOTE: If MOLT order for "ARUP everolimus mass spec assay" is received. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

Units:
ng/mL

Reference Interval:
Therapeutic: 3-8 ng/mL
Potentially toxic: > 12 ng/mL

Note: this therapeutic range is based upon use of everolimus in adult patients to prevent rejection after receiving a kidney transplant. The therapeutic range for the use of everolimus in other indications has not yet been established and may vary from the range documented here.


Synonyms:
• Afinitor
• Certican
• Zortress

Stability (from collection to initiation):
Refrigerated 3 days, frozen 28 days.

Reported:
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

Additional Information:
This everolimus immunoassay has SIGNIFICANT cross-reactivity with sirolimus. If a patient is on both everolimus and sirolimus, DO NOT order this everolimus immunoassay. Please order a “miscellaneous outside lab test” and write “ARUP everolimus mass spec assay” in the notes section

NOTE: If patient is taking everolimus AND sirolimus, this immunoassay should not be run to determine the everolimus concentration of the sample. The clinicians should order a MOLT with “ARUP everolimus mass spec assay” written in the notes section. Please order ARUP test #0092118 (everolimus by LC-MS/MS). Ship refrigerated.

CPT Codes:
80299
Exome Sequencing, Family Trio
EXOMT

ORDERING

Ordering Recommendations:
Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXF)

Available Stat:
No

Performing Lab:
GeneDx

Methodology:
Exome Sequencing (HiSeq)

Reported:
10-12 weeks

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

COLLECTION

Sample Type:
EDTA Whole blood

Collect:
Lavender top (6 mL preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Remarks:
Fully completed GeneDx Exome Sequencing requisitions.
http://www.genedx.com/billing/forms/
Further, if the sequence data is to be transferred to UCSF for review the patient (or legal guardian) must sign a consent form for this transfer.

Stability (from collection to initiation):
5 days refrigerated

PROCESSING

Test Code:
EXOMT

Test Group:
Exomes

Sendout:
Yes
Performing Lab:
GeneDx

Specimen Preparation:
Ship sample to GeneDx at ambient temperature.

Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Stability (from collection to initiation):
5 days refrigerated

RESULT INTERPRETATION

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

ADMINISTRATIVE

CPT Codes:
81479-90 x3

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXF)

Test Code:
EXOMT

Test Group:
Exomes

Performing Lab:
GeneDx

Sendout:
Yes

Methodology:
Exome Sequencing (HiSeq)

Remarks:
Fully completed GeneDx Exome Sequencing requisitions.

http://www.genedx.com/billing/forms/

Further, if the sequence data is to be transferred to UCSF for review the patient (or legal guardian) must sign a consent form for this transfer.

Collect:
Lavender top (6 mL preferred)

Amount to Collect:
6 mL blood
Sample Type:
- EDTA Whole blood

Preferred Volume:
- 6 mL blood

Minimum Volume:
- 2 mL blood

Specimen Preparation:
- Ship sample to GeneDx at ambient temperature.
- Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

Stability (from collection to initiation):
- 5 days refrigerated

Reported:
- 10-12 weeks

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

CPT Codes:
- 81479-90 x3
Exome Sequencing, Parental Samples
EXOMP

ORDERING

Ordering Recommendations:
Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXF)

Performing Lab:
GeneDx

Methodology:
Exome Sequencing (HiSeq)

Reported:
10-12 weeks

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

COLLECTION

Sample Type:
EDTA Whole blood

Collect:
Lavender top (6 mL preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Remarks:
Fully completed GeneDx Exome Sequencing requisitions.

http://www.genedx.com/billing/forms/

Forms are NOT required if parental samples are accompanied with proband sample.

Stability (from collection to initiation):
5 days refrigerated

PROCESSING

Test Code:
EXOMP

Test Group:
Exomes

Sendout:
Yes

Performing Lab:
GeneDx

Specimen Preparation:
Ship sample to GeneDx at ambient temperature.

Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

**Preferred Volume:**
- 6 mL blood

**Minimum Volume:**
- 2 mL blood

**Stability (from collection to initiation):**
- 5 days refrigerated

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**RESULT INTERPRETATION**

**Additional Information:**
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

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**ADMINISTRATIVE**

**CPT Codes:**
- 81479-90 x number of samples submitted

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**COMPLETE VIEW**

**Ordering Recommendations:**
Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXF)

**Test Code:**
- EXOMP

**Test Group:**
- Exomes

**Performing Lab:**
- GeneDx

**Sendout:**
- Yes

**Methodology:**
- Exome Sequencing (HiSeq)

**Remarks:**
- Fully completed GeneDx Exome Sequencing requisitions.

http://www.genedx.com/billing/forms/

Forms are NOT required if parental samples are accompanied with proband sample.

**Collect:**
- Lavender top (6 mL preferred)

**Amount to Collect:**
- 6 mL blood

**Sample Type:**
- EDTA Whole blood

**Preferred Volume:**
- 6 mL blood

**Minimum Volume:**
- 2 mL blood
Specimen Preparation:

Ship sample to GeneDx at ambient temperature.

Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

Stability (from collection to initiation):

5 days refrigerated

Reported:

10-12 weeks

Additional Information:

Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

CPT Codes:

81479-90 x number of samples submitted
Exome Sequencing, Proband only

ORDERING

Ordering Recommendations:

- Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXP)

Available Stat:

- No

Performing Lab:

- GeneDx

Methodology:

- Exome Sequencing (HiSeq)

Reported:

- 10-12 weeks

Additional Information:

Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

COLLECTION

Sample Type:

- EDTA Whole blood

Collect:

- Lavender top (6 mL preferred)

Amount to Collect:

- 6 mL blood

Preferred Volume:

- 6 mL blood

Minimum Volume:

- 2 mL blood

Remarks:

- This code is only to be used if there will be no parental samples available to be tested.

  - Fully completed GeneDx Exome Sequencing requisitions.
  
  - http://www.genedx.com/billing/forms/

  Further, if the sequence data is to be transferred to UCSF for review the patient (or legal guardian) must sign a consent form for this transfer.

  Stability (from collection to initiation):

  - 5 days refrigerated

PROCESSING

Test Code:

- EXOPB

Test Group:

- Exomes

Sendout:
Yes

Performing Lab:
GeneDx

Specimen Preparation:
Ship sample to GeneDx at ambient temperature. Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Stability (from collection to initiation):
5 days refrigerated

RESULT INTERPRETATION

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

ADMINISTRATIVE

CPT Codes:
81479-90

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Inpatient testing should be placed using the order for the UCSF Genomic Medicine Laboratory (test code GMLEXP)

Test Code:
EXOPB

Test Group:
Exomes

Performing Lab:
GeneDx

Sendout:
Yes

Methodology:
Exome Sequencing (HiSeq)

Remarks:
This code is only to be used if there will be no parental samples available to be tested.

Fully completed GeneDx Exome Sequencing requisitions.

http://www.genedx.com/billing/forms/

Further, if the sequence data is to be transferred to UCSF for review the patient (or legal guardian) must sign a consent form for this transfer.

Collect:
Lavender top (6 mL preferred)
Amount to Collect:
6 mL blood

Sample Type:
EDTA Whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Specimen Preparation:
Ship sample to GeneDx at ambient temperature. Ship samples overnight at room temperature, Monday-Thursday only. Stability may extend up to 7 days if kept refrigerated.

Stability (from collection to initiation):
5 days refrigerated

Reported:
10-12 weeks

Additional Information:
Clinical Exome Sequencing is a test for identifying disease-causing DNA variants within the 1% of the genome which codes for proteins (exons) or flanks the regions which code for proteins (splice junctions). This test is intended for use in conjunction with the clinical presentation and other markers of disease progression for the management of patients with rare genetic disorders. Even though there are over 2,000 Mendelian diseases caused by known DNA variants, many patients who are suspected or have been clinically demonstrated to have rare genetic disorders do not receive a molecular diagnosis, often due to genetic heterogeneity and the relative inefficiency of the current sequencing technology. It is widely accepted that about 85% of known disease-causing variants occur within the 1% of the genome containing the exons and splice junctions; thus, surveying just this portion of the genome is an efficient and powerful clinical diagnostic tool for individual patients.

CPT Codes:
81479-90
Expanded Carrier Screening

ORDERING

Performing Lab:
- Counsyl

Methodology:
- Full Exon Sequencing

Reported:
- 2 weeks

Additional Information:
The Counsyl Foresight™ Carrier Screen is a physician-prescribed DNA screen performed on a blood or saliva sample. This screen provides information about whether you are a carrier of an inherited disease, such as cystic fibrosis (CF), spinal muscular atrophy (SMA), and fragile X syndrome. A carrier is typically a healthy individual with no family history of the disease he/she is carrying. If parents are carriers of the same genetic condition their baby has a one in four chance of inheriting that disease.

Disease List:

11-beta-hydroxylase-deficient Congenital Adrenal Hyperplasia
21-hydroxylase-deficient Congenital Adrenal Hyperplasia
6-pyruvoyl-tetrahydropterin Synthase Deficiency
ABCC8-related Hyperinsulinism
Achondrogenesis Type 1B
Adenosine Deaminase Deficiency
Alkaptonuria
Alpha Thalassemia
Alpha-1 Antitrypsin Deficiency
Alpha-mannosidosis
Alpha-sarcoglycanopathy
Alstom Syndrome
AMT-related Glycine Encephalopathy
Andermann Syndrome
Argininemia
Argininosuccinic Aciduria
ARSACS
Aspartylglycosaminuria
Ataxia with Vitamin E Deficiency
Ataxia-telangiectasia
ATP7A-related Disorders
Autosomal Recessive Osteopetrosis Type 1
Bardet-Biedl Syndrome, BBS1-related
Bardet-Biedl Syndrome, BBS10-related
Bardet-Biedl Syndrome, BBS12-related
Bardet-Biedl Syndrome, BBS2-related
Beta-sarcoglycanopathy
Biotinidase Deficiency
Bloom Syndrome
Calpainopathy
Canavan Disease
Carbamoylphosphate Synthetase I Deficiency
Carnitine Palmitoyltransferase IA Deficiency
Carnitine Palmitoyltransferase II Deficiency
Cartilage-hair Hypoplasia
Cerebrotendinous Xanthomatosis
Choroideremia
Citrullinemia Type 1
CLN3-related Neuronal Ceroid Lipofuscinosis
CLN5-related Neuronal Ceroid Lipofuscinosis
CLN6-related Neuronal Ceroid Lipofuscinosis
CNGB3-related Achromatopsia
Cohen Syndrome
COL4A3-related Alport Syndrome
COL4A4-related Alport Syndrome
Congenital Disorder of Glycosylation Type Ia
Congenital Disorder of Glycosylation Type Ib
Congenital Disorder of Glycosylation Type Ic
Congenital Finnish Nephrosis
Costeff Optic Atrophy Syndrome
Cystic Fibrosis
Cystinosis
D-bifunctional Protein Deficiency
Diastrophic Dysplasia
Dihydropyrimidine Dehydrogenase Deficiency
Dysferlinopathy
Dystrophinopathy (Including Duchenne/Becker Muscular Dystrophy)
ERCC6-related Disorders
ERCC8-related Disorders
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Fabry Disease
* Factor V Leiden Thrombophilia
Factor XI Deficiency
Familial Dysautonomia
Familial Mediterranean Fever
Fanconi Anemia Type C
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Fragile X Syndrome
Galactokinase Deficiency
Galactosemia
Gamma-sarcoglycanopathy
Gaucher Disease
GJB2-related DFNB1 Nonsyndromic Hearing Loss and Deafness
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GNPTAB-related Disorders
GRACILE Syndrome
HADHA-related Disorders
Hb Beta Chain-related Hemoglobinopathy (Including Beta Thalassemia and Sickle Cell Disease)
Hereditary Fructose Intolerance
Herlitz Junctional Epidermolysis Bullosa, LAMA3-related
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Herlitz Junctional Epidermolysis Bullosa, LAMC2-related
Hexosaminidase A Deficiency (Including Tay-Sachs Disease)
* HFE-associated Hereditary Hemochromatosis
HMG-CoA Lyase Deficiency
Holocarboxylase Synthetase Deficiency
Homocystinuria Caused by Cystathionine Beta-synthase Deficiency
Hydroxethylus Syndrome
Hypophosphatasia, Autosomal Recessive
Inclusion Body Myopathy 2
Isovaleric Acidemia
Joubert Syndrome 2
KCNJ11-related Familial Hyperinsulinism
Krabbe Disease
LAMA2-related Muscular Dystrophy
Leigh Syndrome, French-Canadian Type
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Lysosomal Acid Lipase Deficiency
Maple Syrup Urine Disease Type 1B
Maple Syrup Urine Disease Type Ia
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Metachromatic Leukodystrophy
Methylmalonic Acidemia, cblA Type
Methylmalonic Acidemia, cblB Type
Methylmalonic Aciduria and Homocystinuria, cblC Type
* Mild Hyperhomocysteinemia Caused by MTHFR Deficiency
MKS1-related Disorders
Mucolipidosis III Gamma
Mucolipidosis IV
Mucopolysaccharidosis Type I
Mucopolysaccharidosis Type II
Mucopolysaccharidosis Type IIIA
Mucopolysaccharidosis Type IIIB
Mucopolysaccharidosis Type IIIC
Muscle-eye-brain Disease
MUT-related Methylmalonic Acidemia
MYO7A-related Disorders
NEB-related Nemaline Myopathy
Niemann-Pick Disease Type C
Niemann-Pick Disease Type C2
Niemann-Pick Disease, SMPD1-associated
Nijmegen Breakage Syndrome
Northern Epilepsy
Ornithine Transcarbamylase Deficiency
PCCA-related Propionic Acidemia
PCDH15-related Disorders
Pendred Syndrome
Peroxisome Biogenesis Disorder Type 3
Peroxisome Biogenesis Disorder Type 4
Peroxisome Biogenesis Disorder Type 5
Peroxisome Biogenesis Disorder Type 6
PEX1-related Zellweger Syndrome Spectrum
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Primary Hyperoxaluria Type 2
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PROP1-related Combined Pituitary Hormone Deficiency
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* Pseudocholinesterase Deficiency
Pycnodysostosis
Pyruvate Carboxylase Deficiency
Recessive Multiple Epiphyseal Dysplasia
Rhizomelic Chondrodysplasia Punctata Type 1
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Salla Disease
Sandhoff Disease
Segawa Syndrome
Short Chain Acyl-CoA Dehydrogenase Deficiency
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USH2A-related Disorders
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Very Long Chain Acyl-CoA Dehydrogenase Deficiency
Wilson Disease
X-linked Adrenoleukodystrophy
X-linked Alport Syndrome
X-linked Juvenile Retinoschisis
X-linked Myotubular Myopathy
X-linked Severe Combined Immunodeficiency
Xeroderma Pigmentosum Group A
Xeroderma Pigmentosum Group C
* Must be specifically requested to be included on your panel.

**Synonyms:**
- Foresight Carrier Screen

**COLLECTION**

**Sample Type:**
Whole blood

**Collect:**
Lavender-top

**Amount to Collect:**
4 mL

**Preferred Volume:**
4 mL

**Minimum Volume:**
4 mL

**Remarks:**
Only use tube supplied in kit from Counsyl.

**Stability (from collection to initiation):**
5 days

**Rejection Criteria:**
No Counsyl collection kit when patient presents.

**PROCESSING**

**Test Code:**
ECS

**Sendout:**
Yes

**Performing Lab:**
Counsyl

**Specimen Preparation:**
Use only tube supplied in kit from Counsyl. Replace full tube back into kit with completed Counsyl TRF.

**Preferred Volume:**
4 mL

**Minimum Volume:**
4 mL

**Rejection Criteria:**
No Counsyl collection kit when patient presents.

**Stability (from collection to initiation):**
5 days
RESULT INTERPRETATION

Additional Information:

The Counsyl Foresight™ Carrier Screen is a physician-prescribed DNA screen performed on a blood or saliva sample. This screen provides information about whether you are a carrier of an inherited disease, such as cystic fibrosis (CF), spinal muscular atrophy (SMA), and fragile X syndrome. A carrier is typically a healthy individual with no family history of the disease he/she is carrying. If parents are carriers of the same genetic condition their baby has a one in four chance of inheriting that disease.

Disease List:

11-beta-hydroxylase-deficient Congenital Adrenal Hyperplasia
21-hydroxylase-deficient Congenital Adrenal Hyperplasia
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Alpha-1 Antitrypsin Deficiency
Alpha-mannosidosis
Alpha-sarcoglycanopathy
Alstom Syndrome
AMT-related Glycine Encephalopathy
Andermann Syndrome
Argininemia
Argininosuccinic Aciduria
ARSACS
Aspartylglycosaminuria
Ataxia with Vitamin E Deficiency
Ataxia-telangiectasia
ATP7A-related Disorders
Autosomal Recessive Osteopetrosis Type 1
Bardet-Biedl Syndrome, BBS1-related
Bardet-Biedl Syndrome, BBS10-related
Bardet-Biedl Syndrome, BBS12-related
Bardet-Biedl Syndrome, BBS2-related
Beta-sarcoglycanopathy
Biotinidase Deficiency
Bloom Syndrome
Calpainopathy
Calpainopathy
Carbamoylphosphate Synthetase I Deficiency
Carnitine Palmitoyltransferase IA Deficiency
Carnitine Palmitoyltransferase II Deficiency
Cartilage-hair Hyoplasia
Cerebrotendinous Xanthomatosis
Choroideremia
Citrullinemia Type 1
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Test information subject to change
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X-linked Severe Combined Immunodeficiency
Xeroderma Pigmentosum Group A
Xeroderma Pigmentosum Group C
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ADMINISTRATIVE

CPT Codes:
81479

COMPLETE VIEW

Test Code:
ECS
Performing Lab:
Counsyl
Sendout:
Yes
Methodology:
Full Exon Sequencing
Remarks:
Only use tube supplied in kit from Counsyl.
Collect:
Lavender-top
Amount to Collect:
4 mL
Sample Type:
Whole blood
Preferred Volume:
4 mL
Minimum Volume:
4 mL
Rejection Criteria:
No Counsyl collection kit when patient presents.
Specimen Preparation:
Use only tube supplied in kit from Counsyl. Replace full tube back into kit with completed Counsyl TRF.
Synonyms:
• Foresight Carrier Screen
Stability (from collection to initiation):
5 days
Reported:
2 weeks
Additional Information:
The Counsyl Foresight™ Carrier Screen is a physician-prescribed DNA screen performed on a blood or saliva sample. This screen provides information about whether you are a carrier of an inherited disease, such as cystic fibrosis (CF), spinal muscular atrophy (SMA), and fragile X syndrome. A carrier is typically a healthy individual with no family history of the disease he/she is carrying. If parents are carriers of the same genetic condition their baby has a one in four chance of inheriting that disease.

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X-linked Alport Syndrome
X-linked Juvenile Retinoschisis
X-linked Myotubular Myopathy
X-linked Severe Combined Immunodeficiency
Xeroderma Pigmentosum Group A
Xeroderma Pigmentosum Group C
* Must be specifically requested to be included on your panel.

CPT Codes:
81479

Test information subject to change
Factor 10 Activity, Chromogenic
FXCH

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Chromogenic
Reported:
Test run 6 x per week. Turnaround 3-5 days.
Additional Information:
Useful in regulating coumadin therapy in a patient with a lupus anticoagulant, which occasionally interferes with PT assays.
A prothrombin time (PT) and Factor X Chromogenic should be ordered on the same specimen when a Factor X Chromogenic is requested. If the INR is <1.5, the Factor X Chromogenic will be cancelled.

Synonyms:
• F10
• FX
• Factor X chromogenic

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194). To obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
 FXCH
 Sendout:  
 Yes
 Performing Lab:  
 Quest
 Specimen Preparation:  
 Deliver sample to Hematology ASAP for processing. Separate platelet poor plasma. Freeze at least 1 mL of plasma in a plastic tube at -20C. Order Quest test# 10663X
 Ship Monday-Thursday on dry ice to Send-outs at China Basin for processing to forward to Quest.
 NOTE: For Brown and Toland patients (BTMOLT), ship the frozen plasma to LabCorp, test code 821728.
 Preferred Volume: 
 1 mL plasma
 Minimum Volume: 
 0.5 mL plasma
 Unacceptable Conditions:  
 Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
 Stability (from collection to initiation): 
 Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

 RESULT INTERPRETATION
 Units: 
 % activity
 Reference Interval: 
 Normal: 73-158% activity
 Therapeutic range for patients on coumadin: 11-42%
 Additional Information:  
 Useful in regulating coumadin therapy in a patient with a lupus anticoagulant, which occasionally interferes with PT assays.
 A prothrombin time (PT) and Factor X Chromogenic should be ordered on the same specimen when a Factor X Chromogenic is requested. If the INR is <1.5, the Factor X Chromogenic will be cancelled.

 ADMINISTRATIVE
 CPT Codes: 
 85260-90
 LOINC Codes: 
 33984-6

 COMPLETE VIEW
 Available Stat:  
 No
 Test Code:  
 FXCH
 Performing Lab:  
 Quest
 Sendout:  
 Yes
 Methodology:  
 Chromogenic
 Remarks:  
 1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.

3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.

4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194). To obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
- Blue top filled to full extent of vacuum

Amount to Collect:
- 2.7 mL blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 1 mL plasma

Minimum Volume:
- 0.5 mL plasma

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
- Deliver sample to Hematology ASAP for processing. Separate platelet poor plasma. Freeze at least 1 mL of plasma in a plastic tube at -20C. Order Quest test# 10663X

Ship Monday-Thursday on dry ice to Send-outs at China Basin for processing to forward to Quest.

NOTE: For Brown and Toland patients (BTMOLT), ship the frozen plasma to LabCorp, test code 821728.

Units:
- % activity

Reference Interval:
- Normal: 73-158% activity
- Therapeutic range for patients on coumadin: 11-42%

Synonyms:
- F10
- FX
- Factor X chromogenic

Stability (from collection to initiation):
- Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
- Test run 6 x per week. Turnaround 3-5 days.

Additional Information:
- Useful in regulating coumadin therapy in a patient with a lupus anticoagulant, which occasionally interferes with PT assays.

A prothrombin time (PT) and Factor X Chromogenic should be ordered on the same specimen when a Factor X Chromogenic is requested. If the INR is <1.5, the Factor X Chromogenic will be cancelled.

CPT Codes:
- 85260-90

LOINC Codes:
- 33984-6
Factor 10 Activity, Routine

ORDERING

Available Stat: No
Performing Lab: Parnassus Hematology
Performed: Test run 0800-1500 Monday-Friday
Methodology: Clotting assay (Stago - STAR)
Reported: 1-3 days
Additional Information: If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for
Synonyms:
- F10
- FX
- Factor X

COLLECTION

Sample Type: Citrated plasma
Collect: Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL blood
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code: F10
Test Group:

Coagulation Factor Activities

Performing Lab:

Parnassus Hematology

Specimen Preparation:

Provide sample(s) to Hematology section asap.

Preferred Volume:

1 mL plasma

Minimum Volume:

0.5 mL plasma

Unacceptable Conditions:

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Stability (from collection to initiation):

Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units:

%

Reference Interval:

0-4 days: 12-68%
5 days to 30 days: 19-79%
1 month - 3 months: 31-87%
3 months - 6 months: 35-107%
6 months - 1 year: 38-118%
1-5 years: 58-116%
6-10 years: 55-101%
11 - 17 years: 50-117%
>= 18 year old: 71-143%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD.

The table above gives age-adjusted reference ranges for Pediatric Factor 10 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population. These values are based upon these references:


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Additional Information:

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:

85260

LOINC Codes:

3218-5

COMPLETE VIEW

Available Stat:

No

Test Code:

F10
Test Group: Coagulation Factor Activities
Performing Lab: Parnassus Hematology
Performed: Test run 0800-1500 Monday-Friday
Methodology: Clotting assay (Stago - STAR)
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Units:
%

Reference Interval:
0-4 days: 12-68%
5 days to 30 days: 19-79%
1 month - 3 months: 31-87%
3 months - 6 months: 35-107%
6 months - 1 year: 38-118%
1-5 years: 58-116%
6-10 years: 55-101%
11 - 17 years: 50-117%
>= 18 year old: 71-143%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD.

The table above gives age-adjusted reference ranges for Pediatric Factor 10 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population. These values are based upon these references:


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Synonyms:
- F10
• FX
• Factor X

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

Reported:
1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85260

LOINC Codes:
3218-5
Factor 11 Activity
F11

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
Test run 0800-1500 Monday-Friday

Note: If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194.

Methodology:
Clotting assay (Stago - STAR)

Reported:
1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- FXI
- F11
- Factor XI

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Test Code: F11
Test Group: Coagulation Factor Activities
Performing Lab: Parnassus & Mission Bay Hematology
Specimen Preparation: Provide sample(s) to Hematology section asap.
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Unacceptable Conditions: Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation): Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units: %
Reference Interval:
- Day 1: 10-66%
- Day 5: 23-87%
- Day 30: 27-79%
- Day 90: 41-97%
- Day 180: 38-134%
- >= 18 year old: 72-161%


Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes: 85270
LDT or Modified FDA: Yes
LOINC Codes: 3226-8

COMPLETE VIEW

Available Stat: No
Test Code: F11
Test Group: Coagulation Factor Activities
Performing Lab: Parnassus & Mission Bay Hematology
Performed: 06/07/19

Test information subject to change
Test run 0800-1500 Monday-Friday

**Note:** If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194.

**Methodology:**
Clotting assay (Stago - STAR)

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Collect:**
Blue top filled to full extent of vacuum

**Amount to Collect:**
2.7 mL blood

**Sample Type:**
Citrated plasma

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Specimen Preparation:**
Provide sample(s) to Hematology section asap.

**Units:**
%

**Reference Interval:**
Day 1: 10-66%
Day 5: 23-87%
Day 30: 27-79%
Day 90: 41-97%
Day 180: 38-134%
>= 18 year old: 72-161%


**Synonyms:**
- FXI
- F11
- Factor XI

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

**Reported:**
1-3 days

**Additional Information:**
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
85270

**LDT or Modified FDA:**
Yes
LOINC Codes:
3226-8
Factor 12 Activity
F12A

**ORDERING**

Available Stat:
No
Performing Lab:
UC Davis
Methodology:
Photometric clot detection
Reported:
Performed 5x per week. Turnaround 3-5 days.
Additional Information:
Factor 12 Deficiency is not associated with a bleeding diathesis.
Synonyms:
- F12
- FXII
- Factor XII
- Contact factor
- Contact activation factor

**COLLECTION**

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1.5 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**PROCESSING**

Test Code:
F12A
Test Group:
  Coagulation Factor Activities
Sendout:
  Yes
Performing Lab:
  UC Davis
Specimen Preparation:
  Provide sample(s) to Hematology section asap. Centrifuge and freeze platelet poor plasma at -20C.

  For B&T patients order Labcorp test #086322
Preferred Volume:
  1.5 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation):
  Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units:
  %
Reference Interval:
  Newborn - Day: 4 13-93%
  Day 5 - 1 Month: 11-83%
  1 Month - 3 Months: 17-81%
  3 Months - 6 Months: 25-109%
  6 Months - 1 Year: 39-115%
  1 Year - 5 Years: 64-129%
  6 Years - 10 years: 60-140%
  11 Years - 16 Years: 34-137%
  >= 17 Years: 50-150%
Additional Information:
  Factor 12 Deficiency is not associated with a bleeding diathesis.

ADMINISTRATIVE

CPT Codes:
  85280-90
LOINC Codes:
  3232-6

COMPLETE VIEW

Available Stat:
  No
Test Code:
  F12A
Test Group:
  Coagulation Factor Activities
Performing Lab:
  UC Davis
Sendout:
Methodology:
Photometric clot detection

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1.5 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap. Centrifuge and freeze platelet poor plasma at -20C.

For B&T patients order Labcorp test #086322

Units:
%

Reference Interval:
Newborn - Day: 4 13-93%
Day 5 - 1 Month: 11-83%
1 Month - 3 Months: 17-81%
3 Months - 6 Months: 25-109%
6 Months - 1 Year: 39-115%
1 Year - 5 Years: 64-129%
6 Years - 10 years: 60-140%
11 Years - 16 Years: 34-137%
>= 17 Years: 50-150%

Synonyms:
- F12
- FXII
- Factor XII
- Contact factor
- Contact activation factor

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
Performed 5x per week. Turnaround 3-5 days.

Additional Information:
Factor 12 Deficiency is not associated with a bleeding diathesis.

CPT Codes:
85280-90
LOINC Codes:
3232-6
Factor 13 Activity
F13A

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Chromogenic
Reported:
7-10 days
Additional Information:
Assay values reported down to 3%.
Low Factor XIII levels ie., < 15% may cause a bleeding disorder and levels < 2% have been associated with spontaneous intracranial hemorrhage.
This assay replaces the previously offered Urea Clot Solubility assay that was discontinued 8/1/07.
This test is performed at Quest using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute, San Juan Capistrano. This test should not be used for diagnosis without confirmation by other medically established means.

Synonyms:
- FSF
- Fibrin stabilizing factor
- Urea Clot Solubility Assay
- Factor 13
- F13
- FXIII
- Factor XIII

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.3 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Avoid hemolysis. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with
adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed

**Rejection Criteria:**
Thawed or hemolyzed sample

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**PROCESSING**

**Test Code:**
F13A

**Test Group:**
Factor XIII

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Deliver sample to Hematology ASAP for processing.
Separate and freeze plasma at -20°C. Ship frozen.

Order Quest #14461X. For Brown and Toland patients (BTMOLT), ship the plasma on dry ice to LabCorp, test code 276937.

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.3 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed

**Rejection Criteria:**
Thawed or hemolyzed sample

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

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**RESULT INTERPRETATION**

**Units:**
%

**Reference Interval:**
57-192%

**Additional Information:**
Assay values reported down to 3%.

Low Factor XIII levels i.e., < 15% may cause a bleeding disorder and levels < 2% have been associated with spontaneous intracranial hemorrhage.

This assay replaces the previously offered Urea Clot Solubility assay that was discontinued 8/1/07.

This test is performed at Quest using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute, San Juan Capistrano. This test should not be used for diagnosis without confirmation by other medically established means.

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**ADMINISTRATIVE**

Printed 06/07/19
Test information subject to change
CPT Codes:
85290-90
LOINC Codes:
27815-0

COMPLETE VIEW

Available Stat:
No

Test Code:
F13A

Test Group:
Factor XIII

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Chromogenic

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Avoid hemolysis. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.3 mL plasma

Rejection Criteria:
Thawed or hemolized sample

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed

Specimen Preparation:
Deliver sample to Hematology ASAP for processing.

Separate and freeze plasma at -20C. Ship frozen.

Order Quest #14461X. For Brown and Toland patients (BTMOLT), ship the plasma on dry ice to LabCorp, test code 276937.

Units:
%

Reference Interval:
57-192%

Synonyms:
• FSF
- Fibrin stabilizing factor
- Urea Clot Solubility Assay
- Factor 13
- F13
- FXIII
- Factor XIII

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

**Reported:**
7-10 days

**Additional Information:**
Assay values reported down to 3%.

Low Factor XIII levels i.e., < 15% may cause a bleeding disorder and levels < 2% have been associated with spontaneous intracranial hemorrhage.

This assay replaces the previously offered Urea Clot Solubility assay that was discontinued 8/1/07.

This test is performed at Quest using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute, San Juan Capistrano. This test should not be used for diagnosis without confirmation by other medically established means.

**CPT Codes:**
85290-90

**LOINC Codes:**
27815-0
Factor 2 Activity

ORDERING

Available Stat: No
Performing Lab: Parnassus Hematology
Performed: Test run 0800-1500 Monday-Friday
Methodology: Clotting assay (Stago - STAR)
Reported: 1-3 days
Additional Information: If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- Prothrombin
- F2
- Factor 2
- Factor II

COLLECTION

Sample Type: Citrated plasma
Collect: Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL blood
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: F2
Test Group: Coagulation Factor Activities
Performing Lab: Parnassus Hematology
Specimen Preparation: Provide sample(s) to Hematology section asap.
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Unacceptable Conditions: Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation): Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units: % activity
Reference Interval:
- 0-4 days: 26-70%
- 5-30 days: 33-93%
- 1-3 months: 34-102%
- 3-6 months: 45-105%
- 6 months - 1 year: 60-116%
- 1-5 years: 71-116%
- 6-10 years: 67-107%
- 11-17 years: 61-104%
- >= 18 years: 81-127%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 2 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes: 85210
LOINC Codes: 3289-6

COMPLETE VIEW

Available Stat: No
Test Code:
F2

Test Group:
Coagulation Factor Activities

Performing Lab:
Parnassus Hematology

Performed:
Test run 0800-1500 Monday-Friday

Methodology:
Clotting assay (Stago - STAR)

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Units:
% activity

Reference Interval:
0-4 days: 26-70%
5-30 days: 33-93%
1-3 months: 34-102%
3-6 months: 45-105%
6 months - 1 year: 60-116%
1-5 years: 71-116%
6-10 years: 67-107%
11-17 years: 61-104%
>= 18 years: 81-127%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 2 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


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Synonyms:
- Prothrombin
- F2
- Factor 2
- Factor II

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85210

LOINC Codes:
3289-6
Factor 5 Activity
F5

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology
Performed:
Test run 0800-1500 Monday-Friday
Methodology:
Clotting assay (Stago - STAR)
Reported:
1-3 days
Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for
Synonyms:
• F5
• FV
• Factor V

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
F5
Test Group:
Coagulation Factor Activities

Performing Lab:
Parnassus Hematology

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units:
%

Reference Interval:
0-4 days: 36-108%
5 days to 30 days: 45-145%
1 month - 3 months: 62-134%
3 months - 6 months: 48-132%
6 months - 1 year: 55-127%
1-5 years: 79-127%
6-10 years: 63-116%
11 - 17 years: 55-99%
>= 18 years: 67-154%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 5 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/mL. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of ages as well as for children 1-5 year, 6-10 years, and 11 - 16 years. The published tables have been converted to the reference range shown.

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85220

LOINC Codes:
3193-0

COMPLETE VIEW

Available Stat:
No

Test Code:
F5
Test Group:
Coagulation Factor Activities

Performing Lab:
Parnassus Hematology

Performed:
Test run 0800-1500 Monday-Friday

Methodology:
Clotting assay (Stago - STAR)

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Units:
%

Reference Interval:
0-4 days: 36-108%
5 days to 30 days: 45-145%
1 month - 3 months: 62-134%
3 months - 6 months: 48-132%
6 months - 1 year: 55-127%
1-5 years: 79-127%
6-10 years: 63-116%
11 - 17 years: 55-99%
>= 18 years: 67-154%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 5 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/mL. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of ages as well as for children 1-5 year, 6-10 years, and 11 - 16 years. The published tables have been converted to the reference range shown.

Synonyms:
• F5
- FV
- Factor V

**Stability (from collection to initiation):**

Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

**Reported:**

1-3 days

**Additional Information:**

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**

85220

**LOINC Codes:**

3193-0
Factor 7 Activity
F7

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology
Performed:
Test run 0800-1500 Monday-Friday
Methodology:
Clotting assay (Stago - STAR)
Reported:
1-3 days
Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.
Synonyms:
- FVII
- F7
- Factor VII

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
F7
Test Group:
  Coagulation Factor Activities
Performing Lab:
  Parnassus Hematology
Specimen Preparation:
  Provide sample(s) to Hematology section asap.
Preferred Volume:
  1 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation):
  Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units:
  %
Reference Interval:
  0-4 days: 28-104%
  5 days to 30 days: 35-143%
  1 month - 3 months: 42-138%
  3 months - 6 months: 39-143%
  6 months - 1 year: 47-127%
  1-5 years: 55-116%
  6-10 years: 52-120%
  11 - 17 years: 58-115%
  >= 18 years: 54-169%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 7 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Additional Information:
  If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

ADMINISTRATIVE

CPT Codes:
  85230
LOINC Codes:
  3200-3

COMPLETE VIEW

Available Stat:
  No
Test Code:
  F7
Test Group:
Coagulation Factor Activities

Performing Lab:
Parnassus Hematology

Performed:
Test run 0800-1500 Monday-Friday

Methodology:
Clotting assay (Stago - STAR)

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Units:
%

Reference Interval:
0-4 days: 28-104%
5 days to 30 days: 35-143%
1 month - 3 months: 42-138%
3 months - 6 months: 39-143%
6 months - 1 year: 47-127%
1-5 years: 55-116%
6-10 years: 52-120%
11 - 17 years: 58-115%
>= 18 years: 54-169%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 7 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Synonyms:
- FVII
- F7
- Factor VII

**Stability (from collection to initiation):**

Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

**Reported:**

1-3 days

**Additional Information:**

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

**CPT Codes:**

85230

**LOINC Codes:**

3200-3
Factor 8 Activity
F8

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Hematology
Performed: Test run 0800-1500 Monday-Friday.
Note: If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194.
Methodology: Clotting assay (Stago - STAR)
Reported: 1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- F8
- FVIII
- FVIII:C
- Factor VIII

COLLECTION

Sample Type: Citrated plasma
Collect: Blue top filled to full extent of vacuum

Amount to Collect: 2.7 mL blood
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: x3-1747, Mission Bay 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
**PROCESSING**

**Test Code:**
F8

**Test Group:**
Coagulation Factor Activities

**Performing Lab:**
Parnassus & Mission Bay Hematology

**Specimen Preparation:**
Provide sample(s) to Hematology section asap.

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

**RESULT INTERPRETATION**

**Units:**
%

**Reference Interval:**
43-168%

Note: During infancy, Factor VIII values can be greater than those observed in adults. Nevertheless, a value of approximately 50% was noted as the lower limit of normal for full term infants from birth to 6 months. (Reference: Andrew M. et al. Blood 1987 70:165).

**Additional Information:**
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**ADMINISTRATIVE**

**CPT Codes:**
85240

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
3209-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
F8

**Test Group:**
Coagulation Factor Activities

**Performing Lab:**
Parnassus & Mission Bay Hematology

**Performed:**
Test run 0800-1500 Monday-Friday.

**Note:** If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call
Methodology:
Clotting assay (Stago - STAR)

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: x3-1747, Mission Bay 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Provide sample(s) to Hematology section asap.

Units:
%

Reference Interval:
43-168%

Note: During infancy, Factor VIII values can be greater than those observed in adults. Nevertheless, a value of approximately 50% was noted as the lower limit of normal for full term infants from birth to 6 months. (Reference: Andrew M. et al. Blood 1987 70:165).

Synonyms:
- F8
- FVIII
- FVIII:C
- Factor VIII

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85240

LDT or Modified FDA:
Yes

LOINC Codes:
3209-4
Factor 8 Activity, Chromogenic
F8CH

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Chromogenic assay
Reported:
Run Thursday, turnaround time 7-10 days
Additional Information:
The chromogenic Factor VIII activity assay may clarify diagnosis and classification of severity of hemophilia A when the regular (one-stage clot based) Factor VIII activity assay provides results at variance with clinical impression. A Factor VIII activity/Chromogenic Factor VIII activity ratio of less than or equal to 0.5 or greater than or equal to 2.0 is considered to be atypical. In patients with atypical ratios, the chromogenic Factor VIII assay may correlate with clinically observed bleeding.

Synonyms:
• F8 Chromogenic
• Factor VIII Activity, Chromogenic

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Frozen plasma is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed specimens are not acceptable.

PROCESSING

Test Code:
F8CH
Sendout:
  Yes
Performing Lab:
  Quest
Specimen Preparation:
  Deliver sample to Hematology Lab ASAP for processing.
  Separate platelet poor plasma. Freeze 1 mL of plasma in a plastic tube at -20°C. Order Quest test# 16049X.
  Ship Monday-Friday frozen and on dry ice to Send-outs at China Basin.
Preferred Volume:
  1 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed specimens are not acceptable.
Stability (from collection to initiation):
  Frozen plasma is stable for 2 weeks at -20°C or 6 months at -70°C.

RESULT INTERPRETATION

Units:
  % activity
Reference Interval:
  65-179% Activity
Additional Information:
  The chromogenic Factor VIII activity assay may clarify diagnosis and classification of severity of hemophilia A when the regular (one-stage clot based) Factor VIII activity assay provides results at variance with clinical impression. A Factor VIII activity/Chromogenic Factor VIII activity ratio of less than or equal to 0.5 or greater than or equal to 2.0 is considered to be atypical. In patients with atypical ratios, the chromogenic Factor VIII assay may correlate with clinically observed bleeding.

ADMINISTRATIVE

CPT Codes:
  85240-90
LOINC Codes:
  49865-9

COMPLETE VIEW

Available Stat:
  No
Test Code:
  F8CH
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Chromogenic assay
Remarks:
  1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
  2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
  3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then
draw a second blue top tube filled to the full extent of the vacuum.

4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
- Blue top filled to full extent of vacuum

Amount to Collect:
- 2.7 mL blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 1 mL plasma

Minimum Volume:
- 0.5 mL plasma

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed specimens are not acceptable.

Specimen Preparation:
- Deliver sample to Hematology Lab ASAP for processing.
- Separate platelet poor plasma. Freeze 1 mL of plasma in a plastic tube at -20C. Order Quest test# 16049X.
- Ship Monday-Friday frozen and on dry ice to Send-outs at China Basin.

Units:
- % activity

Reference Interval:
- 65-179% Activity

Synonyms:
- F8 Chromogenic
- Factor VIII Activity, Chromogenic

Stability (from collection to initiation):
- Frozen plasma is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
- Run Thursday, turnaround time 7-10 days

Additional Information:
- The chromogenic Factor VIII activity assay may clarify diagnosis and classification of severity of hemophilia A when the regular (one-stage clot based) Factor VIII activity assay provides results at variance with clinical impression. A Factor VIII activity/Chromogenic Factor VIII activity ratio of less than or equal to 0.5 or greater than or equal to 2.0 is considered to be atypical. In patients with atypical ratios, the chromogenic Factor VIII assay may correlate with clinically observed bleeding.

CPT Codes:
- 85240-90

LOINC Codes:
- 49865-9
Factor 9 Activity
F9

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
Test run 0800-1500 Monday-Friday

Note: If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194.

Methodology:
Clotting assay (Stago - STAR)

Reported:
1-3 days

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- FIX
- F9
- Factor IX

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology. (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code:
F9
Test Group:
Coagulation Factor Activities
Performing Lab:
Parnassus & Mission Bay Hematology
Specimen Preparation:
Provide sample(s) to Hematology section asap.
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation):
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20°C or 6 months at -70°C.

RESULT INTERPRETATION

Units:
%
Reference Interval:
0-4 days: 15-91%
5 days to 30 days: 15-91%
1 month - 3 months: 21-81%
3 months - 6 months: 21-113%
6 months - 1 year: 36-136%
1-5 years: 47-104%
6-10 years: 63-89%
11 - 17 years: 59-122%
>= 18 years: 60-160%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 9 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.


Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85250
LDT or Modified FDA:
Yes
LOINC Codes:
3187-2

COMPLETE VIEW
Available Stat:

No

Test Code:

F9

Test Group:

Coagulation Factor Activities

Performing Lab:

Parnassus & Mission Bay Hematology

Performed:

Test run 0800-1500 Monday-Friday

Note: If testing is needed outside of these hours, contact Hematology. For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194.

Methodology:

Clotting assay (Stago - STAR)

Remarks:

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology. (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:

Blue top filled to full extent of vacuum

Amount to Collect:

2.7 mL blood

Sample Type:

Citrated plasma

Preferred Volume:

1 mL plasma

Minimum Volume:

0.5 mL plasma

Unacceptable Conditions:

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:

Provide sample(s) to Hematology section asap.

Units:

%

Reference Interval:

0-4 days: 15-91%
5 days to 30 days: 15-91%
1 month - 3 months: 21-81%
3 months - 6 months: 21-113%
6 months - 1 year: 36-136%
1-5 years: 47-104%
6-10 years: 63-89%
11 - 17 years: 59-122%
>= 18 years: 60-160%

UCSF HAS NOT ESTABLISHED NORMAL REFERENCE RANGES FOR FACTOR LEVELS FOR CHILDREN <18 YEARS OLD. The table above gives age-adjusted reference ranges for Pediatric Factor 9 Levels as percentages. The values are expressed by the upper and lower boundary encompassing 95% of the population.

These values are based upon these references: Andrew M. et al. Development of the Human Coagulation System in the Full Term
Values are converted from the original tables, which express values as units/ml. Original tables provide values for infants at 1 day, 5 days, 30 days, 90 days, and 180 days of age as well as for children 1-5 years, 6-10 years, and 11-16 years. The published tables have been converted to the reference range shown.

**Synonyms:**
- FIX
- F9
- Factor IX

**Stability (from collection to initiation):**
Factor assays should generally be performed within four hours of specimen collection or the plasma frozen; the latter is stable for 2 weeks at -20C or 6 months at -70C.

**Reported:**
1-3 days

**Additional Information:**
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
85250

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
3187-2
Factor Inhibitor Titer
FIT

ORDERING

Approval Required:
The factor inhibitor titer may require approval by the Lab Medicine resident. Approval will depend on: (1) patient's clinical history, (2) patient's response to factor therapy, and (3) laboratory results such as the inhibitor screen and factor activity assays.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Reported:
2 weeks

Additional Information:
The inhibitor titer assay, which was originally intended for the measurement of inhibitors occurring in hemophiliacs, can be used with modifications for acquired factor inhibitors from non-hemophiliacs.

Heparin contamination or contamination with other anticoagulants may invalidate results of a factor inhibitor titer.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- F8 inhibitor titer
- Factor 8 inhibitor titer
- FVIII inhibitor titer
- Factor VIII inhibitor titer F9 inhibitor titer
- Factor 9 inhibitor titer
- FIX inhibitor titer

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum x2

Amount to Collect:
5.4 mL blood

Preferred Volume:
3 mL plasma

Minimum Volume:
2 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
The plasma for a Factor Inhibitor Titer must be frozen within four hours of specimen collection. The frozen plasma is stable for 2 weeks at -20C or 6 months at -70C.
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code: FIT
Test Group: Factor Inhibitor Titer
Performing Lab: Parnassus Hematology
Specimen Preparation:
Deliver specimen to Hematology section for processing ASAP
Prefered Volume:
3 mL plasma
Minimum Volume:
2 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation):
The plasma for a Factor Inhibitor Titer must be frozen within four hours of specimen collection. The frozen plasma is stable for 2 weeks at -20C or 6 months at -70C.

RESULT INTERPRETATION

Units:
Bethesda units (BU)
Reference Interval:
<0.1 BU
Additional Information:
The inhibitor titer assay, which was originally intended for the measurement of inhibitors occurring in hemophiliacs, can be used with modifications for acquired factor inhibitors from non-hemophiliacs.
Heparin contamination or contamination with other anticoagulants may invalidate results of a factor inhibitor titer.
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85335 x 6
LDT or Modified FDA:
Yes
LOINC Codes:
13591-3

COMPLETE VIEW

Approval Required:
The factor inhibitor titer may require approval by the Lab Medicine resident. Approval will depend on: (1) patient's clinical history, (2) patient's response to factor therapy, and (3) laboratory results such as the inhibitor screen and factor activity assays.
Available Stat:
No
Test Code:
FIT
Test Group:
Factor Inhibitor Titer

Performing Lab:
Parnassus Hematology

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum x2

Amount to Collect:
5.4 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
3 mL plasma

Minimum Volume:
2 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Deliver specimen to Hematology section for processing ASAP

Units:
Bethesda units (BU)

Reference Interval:
<0.1 BU

Synonyms:
- F8 inhibitor titer
- Factor 8 inhibitor titer
- FVIII inhibitor titer
- Factor VIII inhibitor titer F9 inhibitor titer
- Factor 9 inhibitor titer
- FIX inhibitor titer

Stability (from collection to initiation):
The plasma for a Factor Inhibitor Titer must be frozen within four hours of specimen collection. The frozen plasma is stable for 2 weeks at -20C or 6 months at -70C.

Reported:
2 weeks

Additional Information:
The inhibitor titer assay, which was originally intended for the measurement of inhibitors occurring in hemophiliacs, can be used with modifications for acquired factor inhibitors from non-hemophiliacs.

Heparin contamination or contamination with other anticoagulants may invalidate results of a factor inhibitor titer.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85335 x 6

LDT or Modified FDA:
Yes
LOINC Codes:
13591-3
Factor V (F5) Leiden Mutation
FVR

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run once per week, or as needed, day shift only
Methodology: PCR and allele-specific probes
Reported: 7-10 days
Additional Information:

Mutation: NM_000130.4(F5):c.1601G>A (p.Arg534Gln), also known as R506Q

Incidence: Factor V Leiden is the most common form of inherited thrombophilia, accounting for 40-50% of cases. Heterozygosity for Factor V Leiden occurs in 3-8% of the US and European populations and is rare in Asian and African populations. Frequency of homozygosity for Factor V Leiden in white populations is approximately 1 in 5,000.

Pathogenicity: The Factor V Leiden mutation consists of a G to A nucleotide substitution that leads to the R506Q missense mutation and causes Factor Va to become less susceptible to cleavage by activated Protein C, resulting in increase thrombin generation and an elevated risk for venous thromboembolism (VTE). See Table below for relative risks of VTE.

If this mutation was detected, genetic counseling is recommended.

Thrombosis Risk (odds ratio)**:

Heterozygous
First VTE: 3 - 8
With heterozygosity for the F2 20210G>A mutation: 20
With hyperhomocysteinemia 22 with use of oral contraceptive pills: 30
With hormone replacement therapy (HRT): 7 - 16

Homozygous
First VTE: 10 - 80
With oral contraceptive use: 100
With surgery: 20
With pregnancy: 20- 40
Risk of pregnancy loss: 2 - 3

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Thrombosis risk mutations
- Hypercoagulability
- APC resistance
- Activated protein C resistance
- FV Q506
- FVM
- Factor V mutation

Test information subject to change.

Printed 06/07/19
COLLECTION

Sample Type:
Whole blood

Collect:
Lavender top preferred, Blue top and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Preferred Volume:
3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Minimum Volume:
1.5 mL blood

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

PROCESSING

Test Code:
FVR

Test Group:
Thrombosis risk

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Minimum Volume:
1.5 mL blood

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Mutation: NM_000130.4(F5):c.1601G>A (p.Arg534Gln), also known as R506Q

Incidence: Factor V Leiden is the most common form of inherited thrombophilia, accounting for 40-50% of cases. Heterozygosity for Factor V Leiden occurs in 3-8% of the US and European populations and is rare in Asian and African populations. Frequency of homozygosity for Factor V Leiden in white populations is approximately 1 in 5,000.

Pathogenicity: The Factor V Leiden mutation consists of a G to A nucleotide substitution that leads to the R506Q missense mutation and causes Factor Va to become less susceptible to cleavage by activated Protein C, resulting in increase thrombin generation and an elevated risk for venous thromboembolism (VTE). See Table below for relative risks of VTE.

If this mutation was detected, genetic counseling is recommended.

Thrombosis Risk (odds ratio)**:
Heterozygous

First VTE: 3 - 8
With heterozygosity for the F2 20210G>A mutation: 20
With hyperhomocysteinemia 22 with use of oral contraceptive pills: 30
With hormone replacement therapy (HRT): 7 - 16

Homozygous

First VTE: 10 - 80
With oral contraceptive use: 100
With surgery: 20
With pregnancy: 20- 40
Risk of pregnancy loss: 2 - 3

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

** ADMINISTRATIVE **

CPT Codes:
81241

LDT or Modified FDA:
Yes

LOINC Codes:
21667-1

** COMPLETE VIEW **

Available Stat:
No

Test Code:
FVR

Test Group:
Thrombosis risk

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run once per week, or as needed, day shift only

Methodology:
PCR and allele-specific probes

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top preferred, Blue top and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Sample Type:
Whole blood

Preferred Volume:
3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Minimum Volume:
1.5 mL blood

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.
Reference Interval:
Negative

Synonyms:
- Thrombosis risk mutations
- Hypercoagulability
- APC resistance
- Activated protein C resistance
- FV Q506
- FVM
- Factor V mutation

Reported:
7-10 days

Additional Information:
Mutation: NM_000130.4(F5):c.1601G>A (p.Arg534Gln), also known as R506Q

Incidence: Factor V Leiden is the most common form of inherited thrombophilia, accounting for 40-50% of cases. Heterozygosity for Factor V Leiden occurs in 3-8% of the US and European populations and is rare in Asian and African populations. Frequency of homozygosity for Factor V Leiden in white populations is approximately 1 in 5,000.

Pathogenicity: The Factor V Leiden mutation consists of a G to A nucleotide substitution that leads to the R506Q missense mutation and causes Factor Va to become less susceptible to cleavage by activated Protein C, resulting in increase thrombin generation and an elevated risk for venous thromboembolism (VTE). See Table below for relative risks of VTE.

If this mutation was detected, genetic counseling is recommended.

Thrombosis Risk (odds ratio)**:

Heterozygous

First VTE: 3 - 8
With heterozygosity for the F2 20210G>A mutation: 20
With hyperhomocysteinemia 22 with use of oral contraceptive pills: 30
With hormone replacement therapy (HRT): 7 - 16

Homzygous

First VTE: 10 - 80
With oral contraceptive use: 100
With surgery: 20
With pregnancy: 20 - 40
Risk of pregnancy loss: 2 - 3

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:

81241

LDT or Modified FDA:
Yes

LOINC Codes:

21667-1
Fanconi's Anemia with DEB
FANC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Culture, microscopy, karyotyping
Reported:
Test set up daily. Turnaround time: 2-3 weeks.
Additional Information:
An effort will be made to analyze specimens as small as 1 mL, but success cannot be assured with so little sample. Specify if there is a need to search for DEB-induced chromosome breaks, which will generate an additional charge.
Synonyms:
- chromosmoe breakage syndromes
- DEB-induced chromosome breaks
- Diepoxybutane

COLLECTION

Sample Type:
Heparinized whole blood
Collect:
Dark Green top (Na-heparin)
Amount to Collect:
5 mL blood
Preferred Volume:
5 mL blood
Minimum Volume:
3 mL blood
Remarks:
Specify LOOK FOR FANCONI'S ANEMIA on the requisition and request DEB-induced chromosomal breakage testing if that is desired.

PROCESSING

Test Code:
FANC
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Keep the specimen at room temperature-DO NOT REFRIGERATE OR FREEZE. Order Quest # 14598Z If a search for the presence of DEB-induced chromosome breaks is also requested, order Quest DEB, code #5016 in addition.
Preferred Volume:
5 mL blood
Minimum Volume:
3 mL blood

RESULT INTERPRETATION
**Additional Information:**

An effort will be made to analyze specimens as small as 1 mL, but success cannot be assured with so little sample. Specify if there is a need to search for DEB-induced chromosome breaks, which will generate an additional charge.

**ADMINISTRATIVE**

**CPT Codes:**

88230-90, 88262-90

**LOINC Codes:**

43191-6

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

FANC

**Performing Lab:**

Quest

**Sendout:**

Yes

**Methodology:**

Culture, microscopy, karyotyping

**Remarks:**

Specify LOOK FOR FANCONI'S ANEMIA on the requisition and request DEB-induced chromosomal breakage testing if that is desired.

**Collect:**

Dark Green top (Na-heparin)

**Amount to Collect:**

5 mL blood

**Sample Type:**

Heparinized whole blood

**Preferred Volume:**

5 mL blood

**Minimum Volume:**

3 mL blood

**Specimen Preparation:**

Keep the specimen at room temperature—DO NOT REFRIGERATE OR FREEZE. Order Quest # 14598Z if a search for the presence of DEB-induced chromosome breaks is also requested, order Quest DEB, code #5016 in addition.

**Synonyms:**

- chromosomal breakage syndromes
- DEB-induced chromosome breaks
- Diepoxybutane

**Reported:**

Test set up daily. Turnaround time: 2-3 weeks.

**Additional Information:**

An effort will be made to analyze specimens as small as 1 mL, but success cannot be assured with so little sample. Specify if there is a need to search for DEB-induced chromosome breaks, which will generate an additional charge.

**CPT Codes:**

88230-90, 88262-90

**LOINC Codes:**

43191-6
Fatty Acid Profile, Essential
EFA

ORDERING

Available Stat: No
Performing Lab: Mayo
Methodology: Gas Chromatography-Mass Spectrometry (GC-MS) Stable Isotope Dilution Analysis
Reported: 7-9 days

Additional Information:
Fats are important sources of energy for tissues and are important for the function and integrity of cellular membranes. Deficiencies are commonly caused by inadequate dietary intake of lipids due to an unbalanced diet or long-term parenteral nutrition, or by intestinal malabsorption, which is common in conditions such as cystic fibrosis and irritable bowel syndrome. Deficiencies can also be caused by an impairment of biomolecular transformations among fatty acids, such as linoleic acid to arachidonic acid. Linoleic and linolenic acids cannot be made by the body and are essential components of the diet (ie, essential fatty acids).

The major clinical manifestations associated with essential fatty acid deficiency (EFAD) include dermatitis, increased water permeability of the skin, increased susceptibility to infection, lowered resistance to irradiation injury, impaired wound healing, hemolytic anemia, thrombocytopenia, fatty infiltration of the liver, elevated hepatic enzymes, and impaired chylomicron synthesis. Treatment of EFAD depends on the source of the deficiency and may include supplementation of essential fatty acids, linoleic acid and alpha-linolenic acid.

Biochemical abnormalities may be detected before the onset of recognizable clinical manifestations. EFAD can be detected by diminished levels of the essential fatty acids: linoleic acid (C18:2w6) and alpha-linolenic acid (C18:3w3). It can also be detected by increases in the ratio triene/tetraene ratio (Holman index): (eicosatrienoic [mead] acid [C20:3w9]/arachidonic acid [C20:4w6]).

Excess dietary fatty acids have also been linked to the onset of cardiovascular disease. The dietary contents of saturated, monounsaturated, or polyunsaturated fatty acids influence the concentration of cholesterol in low-density and high-density lipoproteins, and consequently the development of atherosclerosis. Regular consumption of, or supplementation with, polyunsaturated fatty acids may have a beneficial effects on long-term cardiovascular prognosis due to their anti-inflammatory and possibly antiarrhythmic effects. Elevated levels of C18:2w6 can contribute to overproduction of the proinflammatory 2-series local hormones.

Synonyms:
- Fatty acid profile of lipids
- Essential Fatty Acid Profile, Triene/Tetraene ratio

COLLECTION

Patient Preparation:
Patient must fast for 12-14 hours and should not consume any alcohol for 24 hours before the specimen is drawn.

Sample Type:
Serum

Collect:
Red top or Gold top

Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum

Remarks:
Include patient age and information regarding treatment, family history, and tentative diagnosis on requisition.

Transport to laboratory immediately after collection for processing.

Stability (from collection to initiation):
Frozen 3 months

PROCESSING

Test Code: EFA
Sendout: Yes
Performing Lab: Mayo
Specimen Preparation: Spin down sample immediately and freeze serum.
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation): Frozen 3 months

RESULT INTERPRETATION

Additional Information:
Fats are important sources of energy for tissues and are important for the function and integrity of cellular membranes. Deficiencies are commonly caused by inadequate dietary intake of lipids due to an unbalanced diet or long-term parenteral nutrition, or by intestinal malabsorption, which is common in conditions such as cystic fibrosis and irritable bowel syndrome. Deficiencies can also be caused by an impairment of biomolecular transformations among fatty acids, such as linoleic acid to arachidonic acid. Linoleic and linolenic acids cannot be made by the body and are essential components of the diet (ie, essential fatty acids).

The major clinical manifestations associated with essential fatty acid deficiency (EFAD) include dermatitis, increased water permeability of the skin, increased susceptibility to infection, lowered resistance to irradiation injury, impaired wound healing, hemolytic anemia, thrombocytopenia, fatty infiltration of the liver, elevated hepatic enzymes, and impaired chylomicron synthesis. Treatment of EFAD depends on the source of the deficiency and may include supplementation of essential fatty acids, linoleic acid and alpha-linolenic acid.

Biochemical abnormalities may be detected before the onset of recognizable clinical manifestations. EFAD can be detected by diminished levels of the essential fatty acids: linoleic acid (C18:2w6) and alpha-linolenic acid (C18:3w3). It can also be detected by increases in the ratio triene/tetraene ratio (Holman index): (eicosatrienoic [mead] acid [C20:3w9]/arachidonic acid [C20:4w6]).

Excess dietary fatty acids have also been linked to the onset of cardiovascular disease. The dietary contents of saturated, monounsaturated, or polyunsaturated fatty acids influence the concentration of cholesterol in low-density and high-density lipoproteins, and consequently the development of atherosclerosis. Regular consumption of, or supplementation with, polyunsaturated fatty acids may have a beneficial effects on long-term cardiovascular prognosis due to their anti-inflammatory and possibly antiarrhythmic effects. Elevated levels of C18:2w6 can contribute to overproduction of the proinflammatory 2-series local hormones.

ADMINISTRATIVE

CPT Codes:
82544-90

COMPLETE VIEW

Available Stat: No
Test Code: EFA
Performing Lab: Mayo
Sendout:
Methodology:
Gas Chromatography-Mass Spectrometry (GC-MS) Stable Isotope Dilution Analysis

Patient Preparation:
Patient must fast for 12-14 hours and should not consume any alcohol for 24 hours before the specimen is drawn.

Remarks:
Include patient age and information regarding treatment, family history, and tentative diagnosis on requisition.

Transport to laboratory immediately after collection for processing.

Collect:
Red top or Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Spin down sample immediately and freeze serum.

Synonyms:
- Fatty acid profile of lipids
- Essential Fatty Acid Profile, Triene/Tetraene ratio

Stability (from collection to initiation):
Frozen 3 months

Reported:
7-9 days

Additional Information:
Fats are important sources of energy for tissues and are important for the function and integrity of cellular membranes. Deficiencies are commonly caused by inadequate dietary intake of lipids due to an unbalanced diet or long-term parenteral nutrition, or by intestinal malabsorption, which is common in conditions such as cystic fibrosis and irritable bowel syndrome. Deficiencies can also be caused by an impairment of biomolecular transformations among fatty acids, such as linoleic acid to arachidonic acid. Linoleic and linolenic acids cannot be made by the body and are essential components of the diet (ie, essential fatty acids).

The major clinical manifestations associated with essential fatty acid deficiency (EFAD) include dermatitis, increased water permeability of the skin, increased susceptibility to infection, lowered resistance to irradiation injury, impaired wound healing, hemolytic anemia, thrombocytopenia, fatty infiltration of the liver, elevated hepatic enzymes, and impaired chylomicron synthesis. Treatment of EFAD depends on the source of the deficiency and may include supplementation of essential fatty acids, linoleic acid and alpha-linolenic acid.

Biochemical abnormalities may be detected before the onset of recognizable clinical manifestations. EFAD can be detected by diminished levels of the essential fatty acids: linoleic acid (C18:2w6) and alpha-linolenic acid (C18:3w3). It can also be detected by increases in the ratio triene/tetraene ratio (Holman index): (eicosatrienoic [mead] acid [C20:3w9]/arachidonic acid [C20:4w6]).

Excess dietary fatty acids have also been linked to the onset of cardiovascular disease. The dietary contents of saturated, monounsaturated, or polyunsaturated fatty acids influence the concentration of cholesterol in low-density and high-density lipoproteins, and consequently the development of atherosclerosis. Regular consumption of, or supplementation with, polyunsaturated fatty acids may have a beneficial effects on long-term cardiovascular prognosis due to their anti-inflammatory and possibly antiarrhythmic effects. Elevated levels of C18:2w6 can contribute to overproduction of the proinflammatory 2-series local hormones.

CPT Codes:
82544-90
Fatty Acids, Nonesterified
NEFA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric, enzymatic
Reported:
Test run Tuesday-Saturday. Turnaround time: 1-3 days.
Synonyms:
• Free Fatty Acids
• FFA
• unesterified fatty acids

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top on ice
Amount to Collect:
4 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Remarks:
Collect ON ICE after an overnight fast; bring IMMEDIATELY to laboratory. Do not use heparin containing vacutainer. Specimens from patients receiving heparin are NOT acceptable.
Stability (from collection to initiation):
Refrigerated 12 hours, frozen at -20C 1 month.
Unacceptable Conditions:
Collected in heparin. Not delivered on ice.

PROCESSING

Test Code:
NEFA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate serum or plasma immediately and freeze at -20C within 2 hours of collection. Order Quest # 22749P
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Unacceptable Conditions:
Collected in heparin. Not delivered on ice.

**Stability (from collection to initiation):**
Refrigerated 12 hours, frozen at -20°C 1 month.

**RESULT INTERPRETATION**

**Units:**
mmol/L

**Reference Interval:**
- Newborn: 0-2.30 mmol/L
- 1-12 months: 0.50-1.60 mmol/L
- 1-7 years: 0.60-1.50 mmol/L
- 8-17 years: 0.20-1.10 mmol/L
- >= 18 year old: 0.09-0.82 mmol/L

**ADMINISTRATIVE**

**CPT Codes:**
82725-90

**LOINC Codes:**
15066-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
NEFA

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Spectrophotometric, enzymatic

**Remarks:**
Collect ON ICE after an overnight fast; bring IMMEDIATELY to laboratory. Do not use heparin containing vacutainer. Specimens from patients receiving heparin are NOT acceptable.

**Collect:**
Gold top on ice

**Amount to Collect:**
4 mL blood

**Sample Type:**
Serum or plasma

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.3 mL serum or plasma

**Unacceptable Conditions:**
Collected in heparin. Not delivered on ice.

**Specimen Preparation:**
Separate serum or plasma immediately and freeze at -20°C within 2 hours of collection. Order Quest # 22749P

**Units:**
mmol/L

**Reference Interval:**
Newborn: 0-2.30 mmol/L
1-12 months: 0.50-1.60 mmol/L
1-7 years: 0.60-1.50 mmol/L
8-17 years: 0.20-1.10 mmol/L
>= 18 year old: 0.09-0.82 mmol/L

Synonyms:

- Free Fatty Acids
- FFA
- Unesterified fatty acids

Stability (from collection to initiation):
Refrigerated 12 hours, frozen at -20°C 1 month.

Reported:
Test run Tuesday-Saturday. Turnaround time: 1-3 days.

CPT Codes:
82725-90

LOINC Codes:
15066-4
Fatty Acids, Very Long Chain, Saturated plus Phytanic acid

ORDERING

Available Stat: No
Performing Lab: KNDY
Methodology: Capillary gas chromatography / massspectroscopy of pentafluorobenzyl bromide fatty acid esters
Reported: 2 weeks
Additional Information: This test is restricted to the Neurology/Pediatric Neurology Services.

Includes Phytanic and Pristanic and Erucic Acid.

For the diagnosis of most peroxisomal disorders of lipid oxidation, including X-linked or neonatal adrenoleukodystrophy, "infantile" and "adult" Refsum's disease, Zellweger syndrome and rhizomelic chondrodysplasia punctata.

Erucic acid is the active ingredient of Lorenzo's Oil, used in the treatment of X-linked adrenoleukodystrophy. In the presence of a plasma level of erucic acid > 5 µg/mL, the assay for very long chain fatty acids may give false-negative results. As phytanic acid comes from the diet, levels in the newborn period may not be diagnostic. Pristanic acid levels aid in the differential diagnosis of these disorders.

Synonyms: Long chain fatty acids
● VLC-FA
● phytanic acid
● Refsum's disease
● Peroxisomal disease

COLLECTION

Patient Preparation: An 8 hour fast before specimen collection is recommended. For infants, where an 8 hour fast is not possible, it is recommended that the sample be collected just prior to a feeding. Otherwise, false positive results may occur.

Sample Type: EDTA plasma
Collect: Lavender top
Amount to Collect: 6 mL blood
Preferred Volume: 3 mL plasma
Minimum Volume: 1 mL plasma

PROCESSING

Test Code: VLCF
Sendout: Yes
Performing Lab: KNDY
KNDY

Specimen Preparation:
Separate and freeze plasma at -20°C until sent at room temperature by Federal Express for next day delivery.

Ship to: Peroxisomal Diseases Laboratory, Kennedy Krieger Institute, 707 N. Broadway, rm 421, Baltimore, MD 21205, (888)554-2080, fax (410)502-8279 mosera@kennedykrieger.org www.genetics.kennedykrieger.org

Preferred Volume:
3 mL plasma
Minimum Volume:
1 mL plasma

RESULT INTERPRETATION

Units:
µg/mL

Reference Interval:

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>X-linked ALD hemizygote</th>
<th>X-linked ALD Heterozygote</th>
<th>Zellweger Syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>C26:0</td>
<td>µg/mL</td>
<td>0.24 (0.14)</td>
<td>1.30 (0.45)</td>
<td>0.68 (0.29)</td>
</tr>
<tr>
<td>C26:1</td>
<td>µg/mL</td>
<td>0.11 (0.04)</td>
<td>0.34 (0.16)</td>
<td>0.23 (0.10)</td>
</tr>
<tr>
<td>Phytanic acid</td>
<td>µg/mL</td>
<td>0.54 (0.29)</td>
<td>0.57 (0.46)</td>
<td>0.45 (0.22)</td>
</tr>
<tr>
<td>Pristanic acid</td>
<td>µg/mL</td>
<td>0.05 (0.04)</td>
<td>0.06 (0.06)</td>
<td>0.06 (0.03)</td>
</tr>
<tr>
<td>C22:0</td>
<td>µg/mL</td>
<td>29.76 (6.45)</td>
<td>18.50 (5.10)</td>
<td>19.41 (4.08)</td>
</tr>
<tr>
<td>C24:0</td>
<td>µg/mL</td>
<td>22.88 (4.88)</td>
<td>32.25 (8.20)</td>
<td>24.89 (5.42)</td>
</tr>
<tr>
<td>C22:1 (n-9)</td>
<td>µg/mL</td>
<td>1.61 (0.45)</td>
<td>1.19 (0.66)</td>
<td>1.33 (0.41)</td>
</tr>
<tr>
<td>Erucic acid</td>
<td>µg/mL</td>
<td>0.78 (0.10)</td>
<td>1.71 (0.23)</td>
<td>1.30 (0.19)</td>
</tr>
<tr>
<td>C24/C22</td>
<td>µg/mL</td>
<td>0.01 (0.003)</td>
<td>0.07 (0.03)</td>
<td>0.04 (0.02)</td>
</tr>
</tbody>
</table>

Additional Information:
This test is restricted to the Neurology/Pediatric Neurology Services.

Includes Phytanic and Pristanic and Erucic Acid.

For the diagnosis of most peroxisomal disorders of lipid oxidation, including X-linked or neonatal adrenoleukodystrophy, "infantile" and "adult" Refsum's disease, Zellweger syndrome and rhizomelic chondrodysplasia punctata.

Erucic acid is the active ingredient of Lorenzo's Oil, used in the treatment of X-linked adrenoleukodystrophy. In the presence of a plasma level of erucic acid > 5 µg/mL, the assay for very long chain fatty acids may give false-negative results. As phytanic acid comes from the diet, levels in the newborn period may not be diagnostic. Pristanic acid levels aid in the differential diagnosis of these disorders.

ADMINISTRATIVE

CPT Codes:
82726-90
LOINC Codes:
34169-3

COMPLETE VIEW

Available Stat:
No

Test Code:
VLCF

Performing Lab:
KNDY

Sendout:
Yes

Methodology:
Capillary gas chromatography / mass spectrometry of pentafluorobenzyl bromide fatty acid esters

**Patient Preparation:**
An 8 hour fast before specimen collection is recommended. For infants, where an 8 hour fast is not possible, it is recommended that the sample be collected just prior to a feeding. Otherwise, false positive results may occur.

**Collect:**
Lavender top

**Amount to Collect:**
6 mL blood

**Sample Type:**
EDTA plasma

**Preferred Volume:**
3 mL plasma

**Minimum Volume:**
1 mL plasma

**Specimen Preparation:**
Separate and freeze plasma at -20C until sent at room temperature by Federal Express for next day delivery.

Ship to: Peroxisomal Diseases Laboratory, Kennedy Krieger Institute, 707 N. Broadway, rm 421, Baltimore, MD 21205, (888)554-2080, fax (410)502-8279 mosera@kennedykrieger.org www.genetics.kennedykrieger.org

**Units:**
µg/mL

**Reference Interval:**

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<th>X-linked ALD Heterozygote</th>
<th>Zellweger Syndrome</th>
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<tbody>
<tr>
<td>C26:0</td>
<td>µg/mL 0.24 (0.14)</td>
<td>1.30 (0.45)</td>
<td>0.68 (0.29)</td>
<td>3.93 (1.50)</td>
</tr>
<tr>
<td>C26:1</td>
<td>µg/mL 0.11 (0.04)</td>
<td>0.34 (0.16)</td>
<td>0.23 (0.10)</td>
<td>4.08 (2.30)</td>
</tr>
<tr>
<td>Phytanic acid</td>
<td>µg/mL 0.54 (0.29)</td>
<td>0.57 (0.46)</td>
<td>0.45 (0.22)</td>
<td>0.40 (0.28)</td>
</tr>
<tr>
<td>Pristanic acid</td>
<td>µg/mL 0.05 (0.04)</td>
<td>0.06 (0.06)</td>
<td>0.06 (0.03)</td>
<td>0.09 (0.16)</td>
</tr>
<tr>
<td>C22:0</td>
<td>µg/mL 29.76 (6.45)</td>
<td>18.50 (5.10)</td>
<td>19.41 (4.08)</td>
<td>8.66 (4.97)</td>
</tr>
<tr>
<td>C24:0</td>
<td>µg/mL 22.88 (4.88)</td>
<td>32.25 (8.20)</td>
<td>24.89 (5.42)</td>
<td>17.51 (8.64)</td>
</tr>
<tr>
<td>C22:1 (n-9)</td>
<td>µg/mL 1.61 (0.45)</td>
<td>1.19 (0.66)</td>
<td>1.33 (0.41)</td>
<td>1.73 (0.65)</td>
</tr>
<tr>
<td>Erucic acid</td>
<td>µg/mL 0.78 (0.10)</td>
<td>1.71 (0.23)</td>
<td>1.30 (0.19)</td>
<td>2.07 (0.28)</td>
</tr>
<tr>
<td>C24/C22</td>
<td>µg/mL 0.01 (0.003)</td>
<td>0.07 (0.03)</td>
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**Synonyms:**
- Long chain fatty acids
- VLC-FA
- phytanic acid
- Refsum's disease
- Peroxisomal disease

**Reported:**
2 weeks

**Additional Information:**
This test is restricted to the Neurology/Pediatric Neurology Services.

Includes Phytanic and Pristanic and Erucic Acid.

For the diagnosis of most peroxisomal disorders of lipid oxidation, including X-linked or neonatal adrenoleukodystrophy, "infantile" and "adult" Refsum's disease, Zellweger syndrome and rhizomelic chondrodysplasia punctata.

Erucic acid is the active ingredient of Lorenzo's Oil, used in the treatment of X-linked adrenoleukodystrophy. In the presence of a plasma level of erucic acid > 5 µg/mL, the assay for very long chain fatty acids may give false-negative results. As phytanic acid comes from the diet, levels in the newborn period may not be diagnostic. Pristanic acid levels aid in the differential diagnosis of these disorders.

**CPT Codes:**
82726-90

**LOINC Codes:**
34169-3
Fc epsilon receptor antibody
CUI

ORDERING

Available Stat: No
Performing Lab: IBT Laboratories
Methodology: Ex vivo challenge, cell culture and histamine analysis
Additional Information: Patients with a chronic form of urticaria who are positive with this test have an autoimmune basis for the disorder. A positive result does not indicate which autoantibody (anti-IgE, anti-FC epsilon receptor I or anti-Fc epsilon receptor II) is present.

Synonyms:
- Anti-FCe receptor antibody
- Autoimmune chronic urticaria testing
- CU antibody signature

COLLECTION

Patient Preparation: Patients taking calcineurin inhibitors should stop their medication for 3 days prior to sample collection.

Sample Type: Serum
Collect: Red top (Gold top acceptable)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks. frozen at -20C 1 year.

PROCESSING

Test Code: CUI
Sendout: Yes
Performing Lab: IBT Laboratories

If shipping is delayed freeze sample at -20C.
Preferred Volume: 1 mL serum
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks. frozen at -20C 1 year.

RESULT INTERPRETATION
Additional Information:
Patients with a chronic form of urticaria who are positive with this test have an autoimmune basis for the disorder. A positive result does not indicate which autoantibody (anti-IgE, anti-FC epsilon receptor I or anti-Fc epsilon receptor II) is present.

ADMINISTRATIVE

CPT Codes:
86343-90, 83088-90, 86021-90

COMPLETE VIEW

Available Stat:
No

Test Code:
CUI

Performing Lab:
IBT Laboratories

Sendout:
Yes

Methodology:
Ex vivo challenge, cell culture and histamine analysis

Patient Preparation:
Patients taking calcineurin inhibitors should stop their medication for 3 days prior to sample collection.

Collect:
Red top (Gold top acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Specimen Preparation:

If shipping is delayed freeze sample at -20C.

Synonyms:
• Anti-Fcε receptor antibody
• Autoimmune chronic urticaria testing
• CU antibody signature

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks. frozen at -20C 1 year.

Additional Information:
Patients with a chronic form of urticaria who are positive with this test have an autoimmune basis for the disorder. A positive result does not indicate which autoantibody (anti-IgE, anti-FC epsilon receptor I or anti-Fc epsilon receptor II) is present.

CPT Codes:
86343-90, 83088-90, 86021-90
Fecal Fat Stain
P408

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift only
Methodology:
Microscopy
Reported:
Same day or next weekday
Additional Information:
In this microscopic screening technique for determining the presence of fat in stool, Sudan IV stain detects the presence of neutral fats and fatty acids. Neutral fats are composed of one or more fatty acids with an alcohol like glycerol. They include the monoglycerides, diglycerides and triglycerides. Fatty acids are carboxylic acids with a long chain of even numbered carbon atoms. They are usually derived from triglycerides or phospholipids. When they are not attached to other molecules they are known as “free” fatty acids. Results are reported as Neutral Fat and Total Fat, which includes neutral fat and fatty acids.

Increased neutral fat suggests pancreatic enzyme deficiency. Increased total fat with normal neutral fat suggests inadequate absorption or impaired bile secretion. This is a qualitative method. Confirmation of steatorrhea is best obtained by a quantitative fecal fat analysis (72 hour stool collection).

Synonyms:
• fat, qualitative
• fecal fat globules
• free fat stain
• sudan black
• stool fat
• stool lipids
• fecal lipids

COLLECTION

Patient Preparation:
Administration of barium, bismuth, Metamucil, castor oil or mineral within 1 week prior to collection of the specimen is contraindicated.

Patient should not be taking any synthetic fat substitutes (eg. Olestra) or fat blocking nutritional substitutes.

Patient should be on a fat controlled diet with at least 100 g fat per day prior to testing.

Sample Type:
Stool
Collect:
Sterile container
Amount to Collect:
2 g or 2 mL liquid stool
Preferred Volume:
2 g or 2 mL liquid stool
Minimum Volume:
1 g or 1 mL liquid stool
Remarks:
Do not submit stool in preservative. Deliver to laboratory within 24 hours of collection. Refrigerate if not delivered to laboratory within 2
hours of collection.

Stability (from collection to initiation):
24 hours refrigerated, 72 hours frozen at -20C

PROCESSING

Test Code:
P408
Performing Lab:
Microbiology
Specimen Preparation:
Refrigerate sample. Freeze at -20C if sample must be held >24 hours before testing is performed.
Preferred Volume:
2 g or 2 mL liquid stool
Minimum Volume:
1 g or 1 mL liquid stool
Stability (from collection to initiation):
24 hours refrigerated, 72 hours frozen at -20C

RESULT INTERPRETATION

Reference Interval:
Neural fat: Not increased
Total fat: Not increased
Additional Information:
In this microscopic screening technique for determining the presence of fat in stool, Sudan IV stain detects the presence of neutral fats and fatty acids. Neutral fats are composed of one or more fatty acids with an alcohol like glycerol. They include the monoglycerides, diglycerides and triglycerides. Fatty acids are carboxylic acids with a long chain of even numbered carbon atoms. They are usually derived from triglycerides or phospholipids. When they are not attached to other molecules they are known as “free” fatty acids. Results are reported as Neutral Fat and Total Fat, which includes neutral fat and fatty acids.

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ADMINISTRATIVE

CPT Codes:
89125
LOINC Codes:
10753-2

COMPLETE VIEW

Available Stat:
No
Test Code:
P408
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift only
Methodology:
Microscopy
Patient Preparation:
Administration of barium, bismuth, Metamucil, castor oil or mineral within 1 week prior to collection of the specimen is contraindicated.
Patient should not be taking any synthetic fat substitutes (e.g., Olestra) or fat blocking nutritional substitutes.

Patient should be on a fat controlled diet with at least 100 g fat per day prior to testing.

Remarks:
Do not submit stool in preservative. Deliver to laboratory within 24 hours of collection. Refrigerate if not delivered to laboratory within 2 hours of collection.

Collect:
Sterile container

Amount to Collect:
2 g or 2 mL liquid stool

Sample Type:
Stool

Preferred Volume:
2 g or 2 mL liquid stool

Minimum Volume:
1 g or 1 mL liquid stool

Specimen Preparation:
Refrigerate sample. Freeze at -20C if sample must be held >24 hours before testing is performed.

Reference Interval:
Neural fat: Not increased
Total fat: Not increased

Synonyms:
- fat, qualitative
- fecal fat globules
- free fat stain
- sudan black
- stool fat
- stool lipids
- fecal lipids

Stability (from collection to initiation):
24 hours refrigerated, 72 hours frozen at -20C

Reported:
Same day or next weekday

Additional Information:
In this microscopic screening technique for determining the presence of fat in stool, Sudan IV stain detects the presence of neutral fats and fatty acids. Neutral fats are composed of one or more fatty acids with an alcohol like glycerol. They include the monoglycerides, diglycerides and triglycerides. Fatty acids are carboxylic acids with a long chain of even numbered carbon atoms. They are usually derived from triglycerides or phospholipids. When they are not attached to other molecules they are known as "free" fatty acids. Results are reported as Neutral Fat and Total Fat, which includes neutral fat and fatty acids.

Increased neutral fat suggests pancreatic enzyme deficiency. Increased total fat with normal neutral fat suggests inadequate absorption or impaired bile secretion. This is a qualitative method. Confirmation of steatorrhea is best obtained by a quantitative fecal fat analysis (72 hour stool collection).

CPT Codes:
89125

LOINC Codes:
10753-2
Fecal Fat, Quantitative
FATF

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Gravimetric (Quest) or Extraction/spectrophotometry (LabCorp)
Reported:
Test performed Monday-Friday. Turnaround time: 7 days.
Additional Information:
Collections of 24 or 48 hours are not recommended since results are subject to greater variability.
Synonyms:
• stool fat
• stool lipids
• fecal lipids

COLLECTION

Patient Preparation:
Patient should be on a diet including 100 grams of fat per day for 3 days prior to collection and during collection period. In children, the amount of fat in the diet should be constant for 1 day before the test and during the test. The patient should not have had mineral oil as a laxative prior to specimen collection.
Sample Type:
Timed stool collection (24, 48 or 72 hour)
Collect:
Non-B&T patients: White plastic 1 gallon container
B&T patients: LabCorp approved paint can with clip locks.
Note: the Red top container with white body (MAYO) is ONLY used for the Alpha-1-Antitrypsin test.
Amount to Collect:
See preferred volume
Preferred Volume:
20 gm
Minimum Volume:
3 gm
Remarks:
Keep specimen refrigerated during collection. Place collection container on ice if refrigeration is not possible. Collect stool directly into collection containers. Do not fill any container more than 2/3 full. If another container is necessary (i.e. liquid stool), request second identical type of container from the clinical laboratory.
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 6 days, frozen at -20C 2 weeks
Unacceptable Conditions:
Container not refrigerated during collection. Containers received > 2/3 full

PROCESSING

Test Code:
FATF
Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Record total collection time (24, 48 or 72 hours) on test requisition. Request the performing laboratory to report the weight of the stool collection. Freeze entire collection can at -20°C and ship on dry ice to China Basin for sendout.

Order Quest # 455 for non-B&T patients. Order LabCorp test #001354 for B&T patients

Preferred Volume:
20 gm

Minimum Volume:
3 gm

Unacceptable Conditions:
Container not refrigerated during collection. Containers received > 2/3 full

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 6 days, frozen at -20°C 2 weeks

RESULT INTERPRETATION

Units: Total g/24 h

Reference Interval:
Breast fed infant: < 1
Child 0-6 years: < 2
>= 18 year old-normal diet: < 7
>= 18 year old-low-fat diet: < 4

Additional Information:
Collections of 24 or 48 hours are not recommended since results are subject to greater variability.

ADMINISTRATIVE

CPT Codes:
82710-90

LOINC Codes:
16142-2

COMPLETE VIEW

Available Stat:
No

Test Code:
FATF

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Gravimetric (Quest) or Extraction/spectrophotometry (LabCorp)

Patient Preparation:
Patient should be on a diet including 100 grams of fat per day for 3 days prior to collection and during collection period. In children, the amount of fat in the diet should be constant for 1 day before the test and during the test. The patient should not have had mineral oil as a laxative prior to specimen collection.

Remarks:
Keep specimen refrigerated during collection. Place collection container on ice if refrigeration is not possible. Collect stool directly into collection containers. Do not fill any container more than 2/3 full. If another container is necessary (i.e. liquid stool), request second identical type of container from the clinical laboratory.
Collect:
Non-B&T patients: White plastic 1 gallon container
B&T patients: LabCorp approved paint can with clip locks.

Note: the Red top container with white body (MAYO) is ONLY used for the Alpha-1-Antitrypsin test.

Amount to Collect:
See preferred volume

Sample Type:
Timed stool collection (24, 48 or 72 hour)

Preferred Volume:
20 gm

Minimum Volume:
3 gm

Unacceptable Conditions:
Container not refrigerated during collection. Containers receivced > 2/3 full

Specimen Preparation:
Record total collection time (24,48 or 72 hours) on test requisition. Request the performing laboratory to report the weight of the stool collection. Freeze entire collection can at -20°C and ship on dry ice to China Basin for sendout.

Order Quest # 455 for non-B&T patients. Order LabCorp test #001354 for B&T patients

Units:
Total g/24 h

Reference Interval:
Breast fed infant: < 1
Child 0-6 years: < 2
>= 18 year old-normal diet: < 7
>= 18 year old-low-fat diet: < 4

Synonyms:
- stool fat
- stool lipids
- fecal lipids

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 6 days, frozen at -20°C 2 weeks

Reported:
Test performed Monday-Friday. Turnaround time: 7 days.

Additional Information:
Collections of 24 or 48 hours are not recommended since results are subject to greater variability.

CPT Codes:
82710-90

LOINC Codes:
16142-2
# Fecal Occult Blood Test (FIT)

**FOBT**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Twice a week (Monday and Thursday day shift)

**Methodology:**
- Immunologic turbidimetry

**Reported:**
- 1-4 days

**Additional Information:**
This test replaces the prior guaiac card method and offers increased sensitivity and specificity. Screening for colorectal cancer should no longer be performed by the guaiac method and cards submitted for this purpose will be rejected. Due to the increased sensitivity of this test only a single test is usually performed (compared with 3 guaiac cards). If multiple samples are received together, only one sample with be tested.

Samples should be tested within 12 days of collection. If the patient does not enter a collection date, the comment 'Collection date unknown' will be entered. Samples greater than 12 days old will be rejected by the lab. Repeat testing may be indicated if sample stability is exceeded.

Screening for occult fecal blood is a Medicare benefit for patient > 50 years old at intervals of at least 11 full months and with the written order of a physician. More frequent testing in the absence of a specific relevant diagnosis is not considered screening, is not covered by Medicare and may result in charges to the patient.

**Synonyms:**
- FIT test
- Immuno-occult blood
- stool guaiac, hemoccult

## COLLECTION

**Sample Type:**
- Stool

**Collect:**
- Stool sampling bottle from kit

**Remarks:**
- Kits are available in some clinics and from the Laboratory collection sites in the ACC and at Mission Bay, 2330 Post St. and the Mount Zion Cancer center.

For inpatient collection kit supply, please order through PMM (McKesson Supply Chain Management).
- PMM# 44780 - KIT COLOSCREEN TEST TAKE HOME OCPU-UCSF
- 20 Kits per PK

**Stability (from collection to initiation):**
- Inoculated sample bottle stable for 12 days at room temperature. Refrigerated 1 month.

**Unacceptable Conditions:**
- Samples must be received by the laboratory within **12 Days** of collection. Samples > 12 days old when received will not be tested.

## PROCESSING

**Test Code:**
- FOBT
Performing Lab:
Immunology

Unacceptable Conditions:
Samples must be received by the laboratory within 12 Days of collection. Samples > 12 days old when received will not be tested.

Stability (from collection to initiation):
Inoculated sample bottle stable for 12 days at room temperature. Refrigerated 1 month.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
This test replaces the prior guaiac card method and offers increased sensitivity and specificity. Screening for colorectal cancer should no longer be performed by the guaiac method and cards submitted for this purpose will be rejected. Due to the increased sensitivity of this test only a single test is usually performed (compared with 3 guaiac cards). If multiple samples are received together, only one sample with be tested.

Samples should be tested within 12 days of collection. If the patient does not enter a collection date, the comment 'Collection date unknown' will be entered. Samples greater than 12 days old will be rejected by the lab. Repeat testing may be indicated if sample stability is exceeded.

Screening for occult fecal blood is a Medicare benefit for patient > 50 years old at intervals of at least 11 full months and with the written order of a physician. More frequent testing in the absence of a specific relevant diagnosis is not considered screening, is not covered by Medicare and may result in charges to the patient.

ADMINISTRATIVE

CPT Codes:
82274

LOINC Codes:
29771-3

COMPLETE VIEW

Available Stat:
No

Test Code:
FOBT

Performing Lab:
Immunology

Performed:
Twice a week (Monday and Thursday day shift)

Methodology:
Immunologic turbidimetry

Remarks:
Kits are available in some clinics and from the Laboratory collection sites in the ACC and at Mission Bay, 2330 Post St. and the Mount Zion Cancer center.

For inpatient collection kit supply, please order through PMM (McKesson Supply Chain Management).
PMM# 44780 - KIT COLOSCREEN TEST TAKE HOME OCPU-UCSF
20 Kits per PK

Collect:
Stool sampling bottle from kit

Sample Type:
Stool

Unacceptable Conditions:
Samples must be received by the laboratory within 12 Days of collection. Samples > 12 days old when received will not be tested.
Reference Interval:
Negative

Synonyms:
- FIT test
- Immuno-occult blood
- stool guaiac, hemoccult

Stability (from collection to initiation):
Inoculated sample bottle stable for 12 days at room temperature. Refrigerated 1 month.

Reported:
1-4 days

Additional Information:
This test replaces the prior guaiac card method and offers increased sensitivity and specificity. Screening for colorectal cancer should no longer be performed by the guaiac method and cards submitted for this purpose will be rejected. Due to the increased sensitivity of this test only a single test is usually performed (compared with 3 guaiac cards). If multiple samples are received together, only one sample will be tested.

Samples should be tested within 12 days of collection. If the patient does not enter a collection date, the comment 'Collection date unknown' will be entered. Samples greater than 12 days old will be rejected by the lab. Repeat testing may be indicated if sample stability is exceeded.

Screening for occult fecal blood is a Medicare benefit for patient > 50 years old at intervals of at least 11 full months and with the written order of a physician. More frequent testing in the absence of a specific relevant diagnosis is not considered screening, is not covered by Medicare and may result in charges to the patient.

CPT Codes:
82274

LOINC Codes:
29771-3
Fecal White Blood Cell Exam
P221

ORDERING

Approval Required:
Yes, for samples from inpatients collected > 72 hours after admission, contact Microbiology at 415-353-1268.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Daily, day and evening shift

Methodology:
Gram stain

Reported:
4 hours

Additional Information:
The presence or absence of fecal leukocytes is of poor sensitivity and specificity in diagnosing hospital-acquired diarrhea, and is no longer offered on hospitalized patients > 72 hours post admission. See also Stool Analysis

Synonyms:
- Fecal leukocytes
- stool analysis

COLLECTION

Sample Type:
Fresh diarrheal stool

Collect:
Clean container

Amount to Collect:
See preferred volume

Preferred Volume:
10 gm

Remarks:
Select a sample of diarrheal stool with an applicator stick, including bloody or mucous discharge if present.

Deliver to lab immediately.

Do not collect samples between 2200 and 0630 hours.

Stability (from collection to initiation):
3 hours

Unacceptable Conditions:
Samples received >3 hours of collection. Stool in preservative.

PROCESSING

Test Code:
P221

Performing Lab:
Microbiology

Specimen Preparation:
Maintain sample at room temperature.

Preferred Volume:
10 gm

**Unacceptable Conditions:**
- Samples received >3 hours of collection. Stool in preservative.

**Stability (from collection to initiation):**
- 3 hours

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative (No cells)

**Additional Information:**
The presence or absence of fecal leukocytes is of poor sensitivity and specificity in diagnosing hospital-acquired diarrhea, and is no longer offered on hospitalized patients > 72 hours post admission. See also Stool Analysis

**ADMINISTRATIVE**

**CPT Codes:**
- 87205

**LOINC Codes:**
- 2755-7

**COMPLETE VIEW**

**Approval Required:**
- Yes, for samples from inpatients collected > 72 hours after admission, contact Microbiology at 415-353-1268.

**Available Stat:**
- No

**Test Code:**
- P221

**Performing Lab:**
- Microbiology

**Performed:**
- Daily, day and evening shift

**Methodology:**
- Gram stain

**Remarks:**
- Select a sample of diarrheal stool with an applicator stick, including bloody or mucous discharge if present.
- Deliver to lab immediately.
- Do not collect samples between 2200 and 0630 hours.

**Collect:**
- Clean container

**Amount to Collect:**
- See preferred volume

**Sample Type:**
- Fresh diarrheal stool

**Preferred Volume:**
- 10 gm

**Unacceptable Conditions:**
- Samples received >3 hours of collection. Stool in preservative.

**Specimen Preparation:**
- Maintain sample at room temperature.

**Reference Interval:**
- Negative (No cells)
Synonyms:
- Fecal leukocytes
- Stool analysis

Stability (from collection to initiation):
3 hours

Reported:
4 hours

Additional Information:
The presence or absence of fecal leukocytes is of poor sensitivity and specificity in diagnosing hospital-acquired diarrhea, and is no longer offered on hospitalized patients > 72 hours post admission. See also Stool Analysis

CPT Codes:
87205

LOINC Codes:
2755-7
Felbamate
FELB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Run 2x per week. Turnaround time 3-6 days
Additional Information:
Felbamate is an anti-epileptic drug used to treat patients with a variety of seizures. Therapeutic monitoring is useful to optimize dose and avoid toxicity.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Collect level 1 hour prior to next dose when patient is at steady state.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
FELB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Order Quest test # 68999P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Collected in Gold top

RESULT INTERPRETATION
Units:
µg/mL (mcg/mL)

Reference Interval:
30-50 µg/mL

Additional Information:
Felbamate is an anti-epileptic drug used to treat patients with a variety of seizures. Therapeutic monitoring is useful to optimize dose and avoid toxicity.

ADMINISTRATIVE

CPT Codes:
80209-90

LOINC Codes:
6899-9

COMPLETE VIEW

Available Stat:
No

Test Code:
FELB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Remarks:
Collect level 1 hour prior to next dose when patient is at steady state.

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Order Quest test # 68999P

Units:
µg/mL (mcg/mL)

Reference Interval:
30-50 µg/mL

Reported:
Run 2x per week. Turnaround time 3-6 days

Additional Information:
Felbamate is an anti-epileptic drug used to treat patients with a variety of seizures. Therapeutic monitoring is useful to optimize dose and avoid toxicity.

CPT Codes:
80209-90

LOINC Codes:
**Ferritin**

**FERR**

**ORDERING**

**Approval Required:**
- For testing outside of normal test availability (e.g. weekend testing) contact Laboratory resident on-call at x3-1667

**Available Stat:**
- No

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Test available on day shift, 7 days per week.

**Methodology:**
- Chemiluminescent Microparticle Immunoassay (Abbott Architect i1000)

**Reported:**
- 1 day

**Additional Information:**
- Ferritin is a more sensitive test of iron stores than serum iron, transferrin saturation (saturation of iron-binding capacity) or RBC indices. Iron-deficient erythropoiesis begins at ferritin levels of 25-40 µg/L, within the reference range; a cutoff level of 16 yields a sensitivity of 75% and a specificity of 98% (Hallberg L et al. Br J Haematol 1993;85:787).

- Markedly elevated levels may be seen in some infections, in hemochromatosis, in patients with repeated red cell transfusions (e.g. thalassemia) and in Hemophagocytic Lymphohistiocytosis (HLH)

- Grossly hemolysed samples may give falsely elevated results by as much as 60% due to the release of intracellular ferritin.

- If a sample is found to be grossly hemolyzed (>200 mg/dL hemoglobin, (hemolytic index >5)), add an ETC comment "HEMIN" (hemolysis present, may tend to increase result)."

**COLLECTION**

**Sample Type:**
- Serum (preferred) or Heparinized plasma

**Collect:**
- Gold top (preferred). Red or Lt. Green top acceptable

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.25 mL serum or plasma

**Stability (from collection to initiation):**
- Refrigerated (2-8°C): 7 days
- Freezer (-10°C or colder): 12 months

**PROCESSING**

**Test Code:**
- FERR

**Performing Lab:**
- China Basin Chemistry

**Specimen Preparation:**
- Refrigerate

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.25 mL serum or plasma

**Stability (from collection to initiation):**
- Refrigerated (2-8°C): 7 days
- Freezer (-10°C or colder): 12 months

### RESULT INTERPRETATION

**Units:**
- µg/L

**Reference Interval:**

#### PEDIATRIC REFERENCE RANGE

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE (ng/mL)</th>
<th>FEMALE (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 - 14 days</td>
<td>100 - 717</td>
<td>100 - 717</td>
</tr>
<tr>
<td>15 days - &lt; 6 months</td>
<td>14 - 647</td>
<td>14 - 647</td>
</tr>
<tr>
<td>6 months - &lt; 1 year</td>
<td>8 - 182</td>
<td>8 - 182</td>
</tr>
<tr>
<td>1 - 5 years</td>
<td>5 - 100</td>
<td>5 - 100</td>
</tr>
<tr>
<td>5 - &lt; 14 years</td>
<td>14 - 79</td>
<td>14 - 79</td>
</tr>
<tr>
<td>14 - &lt; 16 years</td>
<td>13 - 83</td>
<td>5 - 67</td>
</tr>
<tr>
<td>16 - &lt; 19 years</td>
<td>11 - 172</td>
<td>5 - 67</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

#### ADULT REFERENCE RANGE

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE (ng/mL)</th>
<th>FEMALE (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 - 29 years</td>
<td>38 - 270</td>
<td>12 - 114</td>
</tr>
<tr>
<td>30 - 39 years</td>
<td>48 - 420</td>
<td>12 - 160</td>
</tr>
<tr>
<td>40 - 49 years</td>
<td>30 - 490</td>
<td>12 - 240</td>
</tr>
<tr>
<td>50 years and older</td>
<td>30 - 530</td>
<td>18 - 340</td>
</tr>
</tbody>
</table>

Adult reference ranges adopted from ARUP Laboratories based on correlation studies using patient samples.

**Additional Information:**
Ferritin is a more sensitive test of iron stores than serum iron, transferrin saturation (saturation of iron-binding capacity) or RBC indices. Iron-deficient erythropoiesis begins at ferritin levels of 25-40 µg/L, within the reference range; a cutoff level of 16 yields a sensitivity of 75% and a specificity of 98% (Hallberg L et al. Br J Haematol 1993;85:787).

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Grossly hemolysed samples may give falsely elevated results by as much as 60% due to the release of intracellular ferritin.

If a sample is found to be grossly hemolyzed (>200 mg/dL hemoglobin, (hemolytic index >5)), add an ETC comment "HEMIN" (hemolysis present, may tend to increase result)."

### ADMINISTRATIVE

**CPT Codes:**
- 82728

**LOINC Codes:**
- 2276-4

### COMPLETE VIEW

**Approval Required:**
For testing outside of normal test availability (e.g. weekend testing) contact Laboratory resident on-call at x3-1667
Available Stat: No
Test Code: FERR
Performing Lab: China Basin Chemistry
Performed: Test available on day shift, 7 days per week.
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i1000)
Collect: Gold top (preferred). Red or Lt. Green top acceptable
Amount to Collect: 1 mL blood
Sample Type: Serum (preferred) or Heparinized plasma
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.25 mL serum or plasma
Specimen Preparation: Refrigerate
Units: µg/L
Reference Interval:

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Adult reference ranges adopted from ARUP Laboratories based on correlation studies using patient samples.

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Freezer (-10°C or colder): 12 months
Reported: 1 day
Additional Information:
Ferritin is a more sensitive test of iron stores than serum iron, transferrin saturation (saturation of iron-binding capacity) or RBC indices. Iron-deficient erythropoiesis begins at ferritin levels of 25-40 µg/L, within the reference range; a cutoff level of 16 yields a sensitivity of 75% and a specificity of 98% (Hallberg L et al. Br J Haematol 1993;85:787).

Markedly elevated levels may be seen in some infections, in hemochromatosis, in patients with repeated red cell transfusions (e.g.
thalassemia) and in Hemophagocytic Lymphohistiocytosis (HLH)

Grossly hemolysed samples may give falsely elevated results by as much as 60% due to the release of intracellular ferritin.

If a sample is found to be grossly hemolyzed (>200 mg/dL hemoglobin, (hemolytic index >5)), add an ETC comment "HEMIN" (hemolysis present, may tend to increase result)."

CPT Codes:
82728

LOINC Codes:
2276-4
Fetal Bleed Screen
FBLD

ORDERING

Available Stat:
No
Performing Lab:
  Parnassus & Mission Bay Parnassus & Mission Bay Blood Bankss
Additional Information:
A qualitative screening test for Rh positive fetal red blood cells in an Rh negative mother's circulation. This test is performed automatically by the Blood Bank when Rh Immune Globulin (Rhogam) is ordered.

This test is primarily used to determine the need for additional Rhogan doses and if positive the "Fetal cells, Quantitative" (Kleihauer-Betke) test should be performed in order to calculate the additional Rhogam needed.

This test cannot be used to determine the extent of a fetal-maternal hemorrhage in an Rh positive woman. In that setting the Fetal Cells, Quantitative test should be ordered.

Reflex Testing:
If positive, the sample is referred to hematology for Kleihauer-Betke testing to determine the extent of the bleed and to calculate the Rhogam dosage. The Kleihauer-Betke test is billed separately.

Synonyms:
- Rosettings test
- Rh positive fetal red cells
- Rh positive fetal RBC's

COLLECTION

Sample Type:
EDTA whole blood
Collect:
  Lavender top (6 mL size preferred)
Amount to Collect:
  6 mL blood
Preferred Volume:
  6 mL blood
Minimum Volume:
  3 mL blood
Unacceptable Conditions:
  Unsigned, mislabeled or unlabeled sample

PROCESSING

Test Code:
FBLD
Performing Lab:
  Parnassus & Mission Bay Parnassus & Mission Bay Blood Bankss
Preferred Volume:
  6 mL blood
Minimum Volume:
  3 mL blood
Unacceptable Conditions:
  Unsigned, mislabeled or unlabeled sample

Test information subject to change
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
A qualitative screening test for Rh positive fetal red blood cells in an Rh negative mother's circulation. This test is performed automatically by the Blood Bank when Rh Immune Globulin (Rhogam) is ordered.

This test is primarily used to determine the need for additional Rhogan doses and if positive the "Fetal cells, Quantitative" (Kleihauer-Betke) test should be performed in order to calculate the additional Rhogam needed.

This test cannot be used to determine the extent of a fetal-maternal hemorrhage in an Rh positive woman. In that setting the Fetal Cells, Quantitative test should be ordered.

ADMINISTRATIVE

CPT Codes:
85461

LOINC Codes:
33900-2

COMPLETE VIEW

Available Stat:
No

Test Code:
FBLD

Performing Lab:
Parnassus & Mission Bay Parnassus & Mission Bay Blood Bankss

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Reference Interval:
Negative

Synonyms:
- Rosettings test
- Rh positive fetal red cells
- Rh positive fetal RBC's

Reflex Testing:
If positive, the sample is referred to hematology for Kleihauer-Betke testing to determine the extent of the bleed and to calculate the Rhogam dosage. The Kleihauer-Betke test is billed separately.

Additional Information:
A qualitative screening test for Rh positive fetal red blood cells in an Rh negative mother's circulation. This test is performed automatically by the Blood Bank when Rh Immune Globulin (Rhogam) is ordered.

This test is primarily used to determine the need for additional Rhogan doses and if positive the "Fetal cells, Quantitative" (Kleihauer-Betke) test should be performed in order to calculate the additional Rhogam needed.
This test cannot be used to determine the extent of a fetal-maternal hemorrhage in an Rh positive woman. In that setting the Fetal Cells, Quantitative test should be ordered.

**CPT Codes:**
- 85461

**LOINC Codes:**
- 33900-2
Fetal Cells, Quantitative
FETC

ORDERING

Available Stat:
No
Performing Lab:
Mission Bay Hematology
Performed:
Test run 0800-1500 Monday-Friday
Methodology:
Modified Acid Elution as described by Kleihauer-Betke and modified by Clayton.
Reported:
Same day or next weekday.
Additional Information:
Testing for a feto-maternal bleed will NOT be done in the case of an Rh+ infant born to an Rh- mother if the more sensitive Fetal Bleed Screen (rosetting test) run by the Blood Bank is negative.

Other anticoagulants or clotted blood may be used if necessary. A blood sample must be submitted at the same time and tested in parallel with CSF or BF. Each specimen examined is charged separately.

References:

Synonyms:
- Kleihauer-Betke Test
- Acid elution test
- Alkali Denaturation
- Betke test
- fetal RBC's
- Kleihauer test

COLLECTION

Sample Type:
EDTA whole blood, Body Fluid, CSF
Collect:
Lavender top, CSF tube or sterile collection tube
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood, Body fluid or CSF
Remarks:
Complete appropriate requisition and request "Fetal cells, Quantitative"
Stability (from collection to initiation):
Blood refrigerated 48 hours. CSF and Body fluids refrigerated 4-6 hours.

PROCESSING

Test Code:
FETC
Performing Lab:
Mission Bay Hematology
Specimen Preparation:
If test cannot be performed immediately refrigerate sample.

Preferred Volume:
1 mL blood, Body fluid or CSF

Stability (from collection to initiation):
Blood refrigerated 48 hours. CSF and Body fluids refrigerated 4-6 hours.

RESULT INTERPRETATION

Reference Interval:
Pregnant women: < 0.1% Fetal cells

Additional Information:
Testing for a feto-maternal bleed will NOT be done in the case of an Rh+ infant born to an Rh- mother if the more sensitive Fetal Bleed Screen (rosetting test) run by the Blood Bank is negative.

Other anticoagulants or clotted blood may be used if necessary. A blood sample must be submitted at the same time and tested in parallel with CSF or BF. Each specimen examined is charged separately.

References:

ADMINISTRATIVE

CPT Codes:
85460

LOINC Codes:
48556-5

COMPLETE VIEW

Available Stat:
No

Test Code:
FETC

Performing Lab:
Mission Bay Hematology

Performed:
Test run 0800-1500 Monday-Friday

Methodology:
Modified Acid Elution as described by Kleihauer-Betke and modified by Clayton.

Remarks:
Complete appropriate requisition and request "Fetal cells, Quantitative"

Collect:
Lavender top, CSF tube or sterile collection tube

Amount to Collect:
1 mL blood

Sample Type:
EDTA whole blood, Body Fluid, CSF

Preferred Volume:
1 mL blood, Body fluid or CSF

Specimen Preparation:
If test cannot be performed immediately refrigerate sample.

Reference Interval:
Pregnant women: < 0.1% Fetal cells

Synonyms:
• Kleihauer-Betke Test
• Acid elution test
• Alkali Denaturation
• Betke test
• fetal RBC's
• Kleihauer test

**Stability (from collection to initiation):**
Blood refrigerated 48 hours. CSF and Body fluids refrigerated 4-6 hours.

**Reported:**
Same day or next weekday.

**Additional Information:**
Testing for a feto-maternal bleed will NOT be done in the case of an Rh+ infant born to an Rh- mother if the more sensitive Fetal Bleed Screen (rosetting test) run by the Blood Bank is negative.

Other anticoagulants or clotted blood may be used if necessary. A blood sample must be submitted at the same time and tested in parallel with CSF or BF. Each specimen examined is charged separately.

**References:**

**CPT Codes:**
85460

**LOINC Codes:**
48556-5
Fetal Fibronectin
FFN

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Immunoassay (Adeza TLi)
Reported: 4 hours

Additional Information:
Detection of fetal fibronectin in cervico-vaginal secretions is associated with preterm delivery in symptomatic pregnant women between 24 weeks and 34 weeks, 6 days gestation and in asymptomatic pregnant women 22 weeks to 30 weeks, 6 days gestation.

Specimens should be obtained prior to collection of culture specimens, digital cervical examination or vaginal probe by ultrasound examination, as manipulation of the cervix may cause the release of fetal fibronectin.

Fetal fibronectin tests are not intended for use in women with moderate or gross vaginal bleeding, known placental abruption, or placental previa.

Call x3-1501 when more collection tubes and swabs are needed; allow at least 24 hours for delivery of collection kits.

Synonyms:
- FFN
- fibronectin, fetal

COLLECTION

Patient Preparation:
Patient specimens should not be tested if the patient has had sexual intercourse within 24 hours prior to sampling time.

Sample Type:
Vaginal fluid

Collect:
Special container with holding medium for dacron swab (available from lab x3-1501). The collection tube and swab should be stored at room temperature.

Remarks:
Specimens should be obtained prior to collection of culture specimens, digital cervical examination or vaginal probe by ultrasound examination, as manipulation of the cervix may cause the release of fetal fibronectin.

Care must be taken not to contaminate the Dacron collection swab or cervicovaginal secretions with lubricants, soaps, disinfectants or creams.

Fetal fibronectin tests are not intended for use in women with moderate or gross vaginal bleeding, known placental abruption, or placental previa.

Once the specimen is collected, store the collection tube and sample at 4C and transport to laboratory within 24 hours of collection.

Stability (from collection to initiation):
Refrigerated 3 days, frozen at -20C 3 months

Unacceptable Conditions:
Delivered to lab > 24 hours after collection

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code:
FFN
Performing Lab:
Parnassus & Mission Bay Chemistry
Specimen Preparation:
The collection tube and swab should be stored at room temperature.
Unacceptable Conditions:
Delivered to lab > 24 hours after collection
Stability (from collection to initiation):
Refrigerated 3 days, frozen at -20C 3 months

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Detection of fetal fibronectin in cervico-vaginal secretions is associated with preterm delivery in symptomatic pregnant women between 24 weeks and 34 weeks, 6 days gestation and in asymptomatic pregnant women 22 weeks to 30 weeks, 6 days gestation.
Specimens should be obtained prior to collection of culture specimens, digital cervical examination or vaginal probe by ultrasound examination, as manipulation of the cervix may cause the release of fetal fibronectin.
Fetal fibronectin tests are not intended for use in women with moderate or gross vaginal bleeding, known placental abruption, or placental previa.
Call x3-1501 when more collection tubes and swabs are needed; allow at least 24 hours for delivery of collection kits.

ADMINISTRATIVE

CPT Codes:
82731
LOINC Codes:
20404-0

COMPLETE VIEW

Available Stat:
Yes
Test Code:
FFN
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Immunoassay (Adeza TLi)
Patient Preparation:
Patient specimens should not be tested if the patient has had sexual intercourse within 24 hours prior to sampling time.
Remarks:
Specimens should be obtained prior to collection of culture specimens, digital cervical examination or vaginal probe by ultrasound examination, as manipulation of the cervix may cause the release of fetal fibronectin.
Care must be taken not to contaminate the Dacron collection swab or cervicovaginal secretions with lubricants, soaps, disinfectants or creams.
Fetal fibronectin tests are not intended for use in women with moderate or gross vaginal bleeding, known placental abruption, or
placental previa.

Once the specimen is collected, store the collection tube and sample at 4C and transport to laboratory within 24 hours of collection.

Collect:
Special container with holding medium for dacron swab (available from lab x3-1501). The collection tube and swab should be stored at room temperature.

Sample Type:
Vaginal fluid

Unacceptable Conditions:
Delivered to lab > 24 hours after collection

Specimen Preparation:
The collection tube and swab should be stored at room temperature.

Reference Interval:
Negative

Synonyms:
- FFN
- fibronectin, fetal

Stability (from collection to initiation):
Refrigerated 3 days, frozen at -20C 3 months

Reported:
4 hours

Additional Information:
Detection of fetal fibronectin in cervico-vaginal secretions is associated with preterm delivery in symptomatic pregnant women between 24 weeks and 34 weeks, 6 days gestation and in asymptomatic pregnant women 22 weeks to 30 weeks, 6 days gestation.

Specimens should be obtained prior to collection of culture specimens, digital cervical examination or vaginal probe by ultrasound examination, as manipulation of the cervix may cause the release of fetal fibronectin.

Fetal fibronectin tests are not intended for use in women with moderate or gross vaginal bleeding, known placental abruption, or placental previa.

Call x3-1501 when more collection tubes and swabs are needed; allow at least 24 hours for delivery of collection kits.

CPT Codes:
82731

LOINC Codes:
20404-0
**FGFR1 8p11 Break Apart FISH**  
**FGFR1, BFGFR1**

### ORDERING

**Available Stat:**  
No

**Performing Lab:**  
Medical Genomics - Cytogenetics

**Methodology:**  
Fluorescent in-Situ Hybridization

**Reported:**  
1-2 weeks

**Synonyms:**
- FGFR1 8p Break apart rearrangement FISH
- FGFR1
- BFGFR1

### COLLECTION

**Sample Type:**  
Heparinized blood or bone marrow aspirate
Bone biopsy

**Collect:**  
Blood or marrow aspirate: Dark Green top

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Remarks:**
Mix blood and marrow aspirates well

**Stability (from collection to initiation):**
2 days at room temperature

**Unacceptable Conditions:**
Insufficient sample or not collected in heparin

### PROCESSING

**Test Code:**
- BFGFR1: Blood
- FGFR1: Bone marrow

**Performing Lab:**  
Medical Genomics - Cytogenetics

**Specimen Preparation:**
Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

**Preferred Volume:**
Blood: 2 mL
Bone marrow aspirate: 2 mL
?Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- ?Bone marrow core: 1 cm

Unacceptable Conditions:
- Insufficient sample or not collected in heparin

Stability (from collection to initiation):
- 2 days at room temperature

ADMINISTRATIVE

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BFGR1: Blood
- FGFR1: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Methodology:
- Fluorescent in-Situ Hybridization

Remarks:
- Mix blood and marrow aspirates well

Collect:
- Blood or marrow aspirate: Dark Green top

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:
- Heparinized blood or bone marrow aspirateBone biopsy

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- ?Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- ?Bone marrow core: 1 cm

Unacceptable Conditions:
- Insufficient sample or not collected in heparin

Specimen Preparation:
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

Synonyms:
- FGFR1 8p Break apart rearrangement FISH
- FGFR1
- BFGFR1

Stability (from collection to initiation):

2 days at room temperature

**Reported:**
1-2 weeks

**CPT Codes:**
88271 x2, 88275

**LDT or Modified FDA:**
Yes
Fibrin D-Dimers
FDD

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
24 hours, 7 days per week
Methodology:
Immunoturbimetric (Liatest)
Reported:
1 hour
Additional Information:
Reference Interval
The fibrin D-dimer (FDD) levels in 113 normal blood donors were used to calculate a reference interval using a transformed parametric method. This analysis yielded an upper limit of normal of 664 ng/mL with approximately 8% of FDD values >500 ng/mL (1). In APeX, the upper limit of normal has been set at 500 ng/mL in order to alert clinicians to the cutoff value for exclusion of venous thromboembolism (VTE; see below) (2).

Evaluation for VTE, including pulmonary embolism (PE) and deep venous thrombosis (DVT)
In December 2016, Stago received approval from the US FDA for the reagent STA-Liatest D-Di to be used in the exclusion of pulmonary embolism (PE) and deep venous thrombosis (DVT) in patients with low or moderate risk, presenting at an emergency unit. In patients at a low-to-intermediate clinical probability for PE and for whom imaging studies are under consideration, an FDD <500 ng/mL may permit diagnostic imaging (e.g., helical contrast computed tomography or ventilation/perfusion scan) to be avoided. Clinical correlation is advised in these settings. The FDD should only be ordered when there is reasonably substantive clinical suspicion for VTE/PE, as an elevated FDD is a nonspecific finding and can be elevated in the setting of recent fibrinolytic therapy, recent trauma or surgery, large hematoma, malignancy, sepsis or severe infection, cirrhosis, pregnancy, atherosclerosis, hemoglobinopathy, and age >60 years.

Age-adjusted Fibrin D-dimer
For adults >50 years old, clinically assessed as non-high risk for VTE, current practice guidelines suggest that an age adjusted fibrin D-dimer value may be useful as a clinical decision point for avoiding imaging studies. (Ref 3, 4).

Some settings in which the FDD may not be appropriate to exclude VTE/PE include (2):
1. Children
2. High probability for VTE/PE by clinical criteria
3. Current anticoagulation therapy
4. Suspected upper extremity thrombosis or thrombosis distal to knee
5. Substantial time elapsed between onset of thrombosis and laboratory testing (FDD has a half-life of approximately 7 hours and may be cleared from circulation following thrombosis)
6. Deficiency of fibrinolytic enzymes

Evaluation for disseminated intravascular coagulation (DIC)
Obtain a current prothrombin time (PT), activated partial thromboplastin time (aPTT), platelet count, and fibrinogen prior to ordering FDD. In an appropriate clinical context, an FDD >8200 ng/mL is suggestive of DIC. Serial studies following the demonstration of a positive result are not generally useful.

Ordering interval
An acceptable ordering interval for the FDD is (1) 48 hours after last FDD or (2) 24-48 hours after last FDD with the most recent result <6000 ng/mL. If neither of these criteria are met, the FDD will be automatically canceled. Please contact the Hematology Lab Medicine Resident at 353-1747 if the clinical situation warrants more frequent re-evaluation of the FDD.

Limitations
Cloudy specimens (e.g., lipemic specimens) may yield artifactually low values. In some cases, such specimens cannot yield interpretable results.
The presence of rheumatoid factor at a level greater than 50 IU/mL may lead to an over-estimation of the FDD.

References
1. UCSF in-house studies, 2004 and 2009.

Synonyms:
- FDD
- Fibrin D-Dimers

**COLLECTION**

**Sample Type:**
- Citrated plasma

**Collect:**
- Blue top tube filled to full extent of vacuum

**Amount to Collect:**
- 2.7 mL

**Preferred Volume:**
- 1.0 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Remarks:**
- Blue top filled to full extent of vacuum

**Stability (from collection to initiation):**
- Room temperature 4 hours

**Unacceptable Conditions:**
- Lipemic or turbid samples

**PROCESSING**

**Test Code:**
- FDD

**Performing Lab:**
- Parnassus & Mission Bay Hematology

**Specimen Preparation:**
- Deliver specimen immediately to Hematology

**Preferred Volume:**
- 1.0 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- Lipemic or turbid samples

**Stability (from collection to initiation):**
- Room temperature 4 hours

**RESULT INTERPRETATION**

**Units:**
- ng/mL FEU

**Reference Interval:**
- <500 ng/mL

**Additional Information:**
- Reference Interval
- The fibrin D-dimer (FDD) levels in 113 normal blood donors were used to calculate a reference interval using a transformed parametric
method. This analysis yielded an upper limit of normal of 664 ng/mL with approximately 8% of FDD values >500 ng/mL (1). In APeX, the upper limit of normal has been set at 500 ng/mL in order to alert clinicians to the cutoff value for exclusion of venous thromboembolism (VTE; see below) (2).

Evaluation for VTE, including pulmonary embolism (PE) and deep venous thrombosis (DVT)
In December 2016, Stago received approval from the US FDA for the reagent STA-Liatest D-Di to be used in the exclusion of pulmonary embolism (PE) and deep venous thrombosis (DVT) in patients with low or moderate risk, presenting at an emergency unit. In patients at a low-to-intermediate clinical probability for PE and for whom imaging studies are under consideration, an FDD <500 ng/mL may permit diagnostic imaging (e.g., helical contrast computed tomography or ventilation/perfusion scan) to be avoided. Clinical correlation is advised in these settings. The FDD should only be ordered when there is reasonably substantive clinical suspicion for VTE/PE, as an elevated FDD is a nonspecific finding and can be elevated in the setting of recent fibrinolytic therapy, recent trauma or surgery, large hematoma, malignancy, sepsis or severe infection, cirrhosis, pregnancy, atherosclerosis, hemoglobinopathy, and age >60 years.

Age-adjusted Fibrin D-dimer
For adults >50 years old, clinically assessed as non-high risk for VTE, current practice guidelines suggest that an age adjusted fibrin D-dimer value may be useful as a clinical decision point for avoiding imaging studies. (Ref 3, 4).

Some settings in which the FDD may not be appropriate to exclude VTE/PE include (2):
1. Children
2. High probability for VTE/PE by clinical criteria
3. Current anticoagulation therapy
4. Suspected upper extremity thrombosis or thrombosis distal to knee
5. Substantial time elapsed between onset of thrombosis and laboratory testing (FDD has a half-life of approximately 7 hours and may be cleared from circulation following thrombosis)
6. Deficiency of fibrinolytic enzymes

Evaluation for disseminated intravascular coagulation (DIC)
Obtain a current prothrombin time (PT), activated partial thromboplastin time (aPTT), platelet count, and fibrinogen prior to ordering FDD. In an appropriate clinical context, an FDD >8200 ng/mL is suggestive of DIC. Serial studies following the demonstration of a positive result are not generally useful.

Ordering interval
An acceptable ordering interval for the FDD is (1) 48 hours after last FDD or (2) 24-48 hours after last FDD with the most recent result <6000 ng/mL. If neither of these criteria are met, the FDD will be automatically canceled. Please contact the Hematology Lab Medicine Resident at 353-1747 if the clinical situation warrants more frequent re-evaluation of the FDD.

Limitations
Cloudy specimens (e.g., lipemic specimens) may yield artifactually low values. In some cases, such specimens cannot yield interpretable results.

The presence of rheumatoid factor at a level greater than 50 IU/mL may lead to an over-estimation of the FDD.

References
1. UCSF in-house studies, 2004 and 2009.
FDD
Performing Lab:
  Parnassus & Mission Bay Hematology
Performed:
  24 hours, 7 days per week
Methodology:
  Immunoturbimetric (Liatest)
Remarks:
  Blue top filled to full extent of vacuum
Collect:
  Blue top tube filled to full extent of vacuum
Amount to Collect:
  2.7 mL
Sample Type:
  Citrated plasma
Preferred Volume:
  1.0 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Lipemic or turbid samples
Specimen Preparation:
  Deliver specimen immediately to Hematology
Units:
  ng/mL FEU
Reference Interval:
  <500 ng/mL
Synonyms:
  • FDD
  • Fibrin D-Dimers
Stability (from collection to initiation):
  Room temperature 4 hours
Reported:
  1 hour
Additional Information:
Reference Interval
  The fibrin D-dimer (FDD) levels in 113 normal blood donors were used to calculate a reference interval using a transformed parametric method. This analysis yielded an upper limit of normal of 664 ng/mL with approximately 8% of FDD values >500 ng/mL (1). In APeX, the upper limit of normal has been set at 500 ng/mL in order to alert clinicians to the cutoff value for exclusion of venous thromboembolism (VTE; see below) (2)

Evaluation for VTE, including pulmonary embolism (PE) and deep venous thrombosis (DVT)
  In December 2016, Stago received approval from the US FDA for the reagent STA-Liatest D-Di to be used in the exclusion of pulmonary embolism (PE) and deep venous thrombosis (DVT) in patients with low or moderate risk, presenting at an emergency unit. In patients at a low-to-intermediate clinical probability for PE and for whom imaging studies are under consideration, an FDD <500 ng/mL may permit diagnostic imaging (e.g., helical contrast computed tomography or ventilation/perfusion scan) to be avoided. Clinical correlation is advised in these settings. The FDD should only be ordered when there is reasonably substantive clinical suspicion for VTE/PE, as an elevated FDD is a nonspecific finding and can be elevated in the setting of recent fibrinolytic therapy, recent trauma or surgery, large hematoma, malignancy, sepsis or severe infection, cirrhosis, pregnancy, atherosclerosis, hemoglobinopathy, and age >60 years.

Age-adjusted Fibrin D-dimer
  For adults >50 years old, clinically assessed as non-high risk for VTE, current practice guidelines suggest that an age adjusted fibrin D-dimer value may be useful as a clinical decision point for avoiding imaging studies. (Ref 3, 4).

Some settings in which the FDD may not be appropriate to exclude VTE/PE include (2):
  1. Children
  2. High probability for VTE/PE by clinical criteria
  3. Current anticoagulation therapy
4. Suspected upper extremity thrombosis or thrombosis distal to knee
5. Substantial time elapsed between onset of thrombosis and laboratory testing (FDD has a half-life of approximately 7 hours and may be cleared from circulation following thrombosis)
6. Deficiency of fibrinolytic enzymes

Evaluation for disseminated intravascular coagulation (DIC)
Obtain a current prothrombin time (PT), activated partial thromboplastin time (aPTT), platelet count, and fibrinogen prior to ordering FDD. In an appropriate clinical context, an FDD >8200 ng/mL is suggestive of DIC. Serial studies following the demonstration of a positive result are not generally useful.

Ordering interval
An acceptable ordering interval for the FDD is (1) 48 hours after last FDD or (2) 24-48 hours after last FDD with the most recent result <6000 ng/mL. If neither of these criteria are met, the FDD will be automatically canceled. Please contact the Hematology Lab Medicine Resident at 353-1747 if the clinical situation warrants more frequent re-evaluation of the FDD.

Limitations
Cloudy specimens (e.g., lipemic specimens) may yield artifactually low values. In some cases, such specimens cannot yield interpretable results.
The presence of rheumatoid factor at a level greater than 50 IU/mL may lead to an over-estimation of the FDD.

References
1. UCSF in-house studies, 2004 and 2009.

CPT Codes:
85379

LOINC Codes:
48065-7
Fibrin Monomer
FIBM

ORDERING

Approval Required:
Yes, contact Hematology at x3-1747

Available Stat:
No

Performing Lab:
Esoterix

Methodology:
RBC hemagglutination

Reported:
The test is run Monday through Friday. Turnaround time: 4-6 days.

Synonyms:
- Plasma protein paracoagulation test

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
FIBM

Sendout:
Yes

Performing Lab:
Esoterix

Specimen Preparation:
Deliver sample to Hematology ASAP for processing.

Plasma should be separated as soon as possible, distributed into 1 mL aliquots, and frozen at -20C. Order Esoterix test # 300202.

For B&T patients order labcorp test # 500150
**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

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### RESULT INTERPRETATION

**Reference Interval:**
- Negative

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### ADMINISTRATIVE

**CPT Codes:**
- 85366-90

**LOINC Codes:**
- 40702-3

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### COMPLETE VIEW

**Approval Required:**
- Yes, contact Hematology at x3-1747

**Available Stat:**
- No

**Test Code:**
- FIBM

**Performing Lab:**
- Esoterix

**Sendout:**
- Yes

**Methodology:**
- RBC hemagglutination

**Remarks:**
- 1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
- 2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
- 3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
- 4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Deliver immediately to the laboratory.

**Collect:**
- Blue top filled to full extent of vacuum

**Amount to Collect:**
- 2.7 mL blood

**Sample Type:**
- Citrated plasma

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Specimen Preparation:**
- Deliver sample to Hematology ASAP for processing.
Plasma should be separated as soon as possible, distributed into 1 mL aliquots, and frozen at -20°C. Order Esoterix test # 300202.

For B&T patients order labcorp test # 500150

Reference Interval:
Negative

Synonyms:
- Plasma protein paracoagulation test

Reported:
The test is run Monday through Friday. Turnaround time: 4-6 days.

CPT Codes:
- 85366-90

LOINC Codes:
- 40702-3
Fibrinogen, Antigenic
FIBAG

ORDERING

Ordering Recommendations:
Should only be ordered in patients with low levels of fibrinogen by functional assay.

Approval Required:
No, however antigenic fibrinogen will only be performed if the functional fibrinogen is low.

Available Stat:
No

Performing Lab:
Quest

Methodology:
Nephelometry

Reported:
Test is run Tuesday and Friday. Turnaround time: 7-10 days

Additional Information:
Use only to evaluate suspected abnormal fibrinogen.

If an abnormal fibrinogen is suspected, a functional fibrinogen and immunologic fibrinogen (fibrinogen, antigenic) must be run on the same sample. Therefore, if only a fibrinogen antigen is ordered, a functional fibrinogen will be automatically added and separately charged. The Fibrinogen antigen will only be performed if the Functional Fibrinogen is low. If the Functional Fibrinogen is normal, then the Fibrinogen antigen will be cancelled with the notation: Test Not Indicated. In the rare circumstance in which the functional fibrinogen is normal and an assessment for dysfibrinogenemia is nevertheless essential, please contact the hematology laboratory (Parnassus: 3-1747, Mission Bay: call 6-0194) to request that the immunologic fibrinogen be performed.

Rare individuals have a bleeding diathesis or a thrombotic tendency due to the presence of an abnormal fibrinogen (dysfibrinogenemia). This is most commonly hereditary, but dysfibrinogenemia with a bleeding tendency can be acquired in liver disease. Performing functional fibrinogen and immunologic fibrinogen on a plasma sample permits diagnosis of dysfibrinogenemia. Thrombin time and reptilase time are not necessary for diagnosis of dysfibrinogenemia.

Synonyms:
- Factor I
- Fibrinogen antigen
- Immunologic fibrinogen
- Quantitative fibrinogen

COLLECTION

Patient Preparation:
Overnight fasting is required

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma (1.0 mL for LabCorp)

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Stability (from collection to initiation):**
- Refrigerated 3 days, frozen at -20C 3 months.

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

**Rejection Criteria:**
- Sample received unfrozen

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**PROCESSING**

**Test Code:**
- FIBAG

**Test Group:**
- Fibrinogen

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Central Processing: Deliver whole blood sample to Hematology Lab ASAP.
- Hematology: Freeze plasma at -20C. If approved, ship frozen to Quest Nichols, test code #37801X.
- For Brown &Toland patient, order BTMOLT. Ship frozen to LabCorp, test # 117052

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma (1.0 mL for LabCorp)

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

**Rejection Criteria:**
- Sample received unfrozen

**Stability (from collection to initiation):**
- Refrigerated 3 days, frozen at -20C 3 months.

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**RESULT INTERPRETATION**

**Units:**
- mg/dL

**Reference Interval:**
- 180-350 mg/dL

**Additional Information:**
- Use only to evaluate suspected abnormal fibrinogen.

If an abnormal fibrinogen is suspected, a functional fibrinogen and immunologic fibrinogen (fibrinogen, antigenic) must be run on the same sample. Therefore, if only a fibrinogen antigen is ordered, a functional fibrinogen will be automatically added and separately charged. The Fibrinogen antigen will only be performed if the Functional Fibrinogen is low. If the Functional Fibrinogen is normal, then the Fibrinogen antigen will be cancelled with the notation: Test Not Indicated. In the rare circumstance in which the functional fibrinogen is normal and an assessment for dysfibrinogenemia is nevertheless essential, please contact the hematology laboratory (Parnassus: 3-1747, Mission Bay: call 6-0194) to request that the immunologic fibrinogen be performed.

Rare individuals have a bleeding diathesis or a thrombotic tendency due to the presence of an abnormal fibrinogen (dysfibrinogenemia). This is most commonly hereditary, but dysfibrinogenemia with a bleeding tendency can be acquired in liver disease. Performing functional fibrinogen and immunologic fibrinogen on a plasma sample permits diagnosis of dysfibrinogenemia. Thrombin time and reptilase time are not necessary for diagnosis of dysfibrinogenemia.
ADMINISTRATIVE

CPT Codes:
- 85385-90

LOINC Codes:
- 42772-4

COMPLETE VIEW

Approval Required:
No, however antigenic fibrinogen will only be performed if the functional fibrinogen is low.

Available Stat:
No

Ordering Recommendations:
Should only be ordered in patients with low levels of fibrinogen by functional assay.

Test Code:
FIBAG

Test Group:
Fibrinogen

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Nephelometry

Patient Preparation:
Overnight fasting is required

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma (1.0 mL for LabCorp)

Rejection Criteria:
Sample received unfrozen

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

Specimen Preparation:
Central Processing: Deliver whole blood sample to Hematology Lab ASAP.

Hematology: Freeze plasma at -20C. If approved, ship frozen to Quest Nichols, test code #37801X.

For Brown &Toland patient, order BTMOLT. Ship frozen to LabCorp, test # 117052

Units:
mg/dL
Reference Interval:
180-350 mg/dL

Synonyms:
- Factor I
- Fibrinogen antigen
- Immunologic fibrinogen
- Quantitative fibrinogen

Stability (from collection to initiation):
Refrigerated 3 days, frozen at -20°C 3 months.

Reported:
Test is run Tuesday and Friday. Turnaround time: 7-10 days

Additional Information:
Use only to evaluate suspected abnormal fibrinogen.

If an abnormal fibrinogen is suspected, a functional fibrinogen and immunologic fibrinogen (fibrinogen, antigenic) must be run on the same sample. Therefore, if only a fibrinogen antigen is ordered, a functional fibrinogen will be automatically added and separately charged. The Fibrinogen antigen will only be performed if the Functional Fibrinogen is low. If the Functional Fibrinogen is normal, then the Fibrinogen antigen will be cancelled with the notation: Test Not Indicated. In the rare circumstance in which the functional fibrinogen is normal and an assessment for dysfibrinogenemia is nevertheless essential, please contact the hematology laboratory (Parnassus: 3-1747, Mission Bay: call 6-0194) to request that the immunologic fibrinogen be performed.

Rare individuals have a bleeding diathesis or a thrombotic tendency due to the presence of an abnormal fibrinogen (dysfibrinogenemia). This is most commonly hereditary, but dysfibrinogenemia with a bleeding tendency can be acquired in liver disease. Performing functional fibrinogen and immunologic fibrinogen on a plasma sample permits diagnosis of dysfibrinogenemia. Thrombin time and reptilase time are not necessary for diagnosis of dysfibrinogenemia.

CPT Codes:
85385-90

LOINC Codes:
42772-4
Fibrinogen, Functional

**FIB**

### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**
- Test available 24 hours per day 7 days per week

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**

Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy: 1. Running additional assays can help clarify whether a low functional fibrinogen is due to hypofibrinogenemia, dysfibrinogenemia (abnormal fibrinogen), an unusually high level of heparin contamination, or other problem such as DIC with high fibrin split products. a. If a dysfibrinogenemia is suspected, an immunologic fibrinogen (Fibrinogen, Antigenic) may be added to the same sample if requested within stability period (4 hours after collection). b. If DIC is suspected, FDD (Fibrin D-Dimer) may be added to the same sample if requested within stability period (4 hours after collection). c. Thrombin Time and/or Reptilase Assay may also be useful in evaluation of a low functional fibrinogen.

2. Direct thrombin inhibitors may interfere with fibrinogen measurement when fibrinogen levels are less than 150 mg/dL. In this setting, the reported fibrinogen may be inaccurately decreased relative to the true value. (As an example: in a patient receiving argatroban, a reported level of 70 mg/dL would indicate that the true fibrinogen level is between 70 and 150 mg/dL). In this setting, an accurate value cannot be determined.

3. Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy.

**Synonyms:**
- Factor I
- Quantitative fibrinogen
- functional fibrinogen

### COLLECTION

**Sample Type:**
- Citrated plasma

**Collect:**
- Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

**Amount to Collect:**
- Blue top: 2.7 mL blood
- Lt. Blue top: 1.8 mL blood

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Remarks:**

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap..

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Stability (from collection to initiation):**
Specimen is stable for up to 24 hours at room temperature.

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

### PROCESSING

**Test Code:**
- FIB

**Test Group:**
- Fibrinogen

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Hematology

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Stability (from collection to initiation):**
- Specimen is stable for up to 24 hours at room temperature.

### RESULT INTERPRETATION

**Units:**
- mg/dL

**Reference Interval:**
- 202-430 mg/dL

**Note:** Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy.

**Critical Values:**
- <= 100 mg/dL if new finding within previous 24 hours. A value <= 50 mg/dL is always phoned.

**Additional Information:**
- Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy:
  1. Running additional assays can help clarify whether a low functional fibrinogen is due to hypofibrinogenemia, dysfibrinogenemia (abnormal fibrinogen), an unusually high level of heparin contamination, or other problem such as DIC with high fibrin split products.
  2. If a dysfibrinogenemia is suspected, an immunologic fibrinogen (Fibrinogen, Antigenic) may be added to the same sample if requested within stability period (4 hours after collection).
  3. If DIC is suspected, FDD (Fibrin D-Dimer) may be added to the same sample if requested within stability period (4 hours after collection).
  4. Thrombin Time and/or Reptilase Assay may also be useful in evaluation of a low functional fibrinogen.

  2. Direct thrombin inhibitors may interfere with fibrinogen measurement when fibrinogen levels are less than 150 mg/dL. In this setting, the reported fibrinogen may be inaccurately decreased relative to the true value. (As an example: in a patient receiving argatroban, a reported level of 70 mg/dL would indicate that the true fibrinogen level is between 70 and 150 mg/dL). In this setting, an accurate value cannot be determined.

  3. Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy.

### ADMINISTRATIVE

**CPT Codes:**
- 85384

**LOINC Codes:**
- 3255-7

### COMPLETE VIEW

**Available Stat:**
- Yes

**Test Code:**
**Test Group:**
Fibrinogen

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**
Test available 24 hours per day 7 days per week

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Collect:**
Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

**Amount to Collect:**
Blue top: 2.7 mL blood
Lt. Blue top: 1.8 mL blood

Note: If heparabsorption is required draw a full Blue top (2.7 mL)

**Sample Type:**
Citrated plasma

**Preferred Volume:**
1.5 mL plasma

**Minimum Volume:**
1 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Units:**
mg/dL

**Reference Interval:**
202-430 mg/dL

Note: Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy.

**Critical Values:**
<= 100 mg/dL if new finding within previous 24 hours. A value <= 50 mg/dL is always phoned.

**Synonyms:**
- Factor I
- Quantitative fibrinogen
- functional fibrinogen

**Stability (from collection to initiation):**
Specimen is stable for up to 24 hours at room temperature.

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy: 1. Running additional assays can help clarify whether a low functional fibrinogen is due to hypofibrinogenemia, dysfibrinogenemia (abnormal fibrinogen), an unusually high level of heparin contamination, or other problem such as DIC with high fibrin split products. a. If dysfibrinogenemia is suspected, an immunologic fibrinogen (Fibrinogen, Antigenic) may be added to the same sample if requested within stability period (4 hours after collection). b. If DIC is suspected, FDD (Fibrin D-Dimer) may be added to the same sample if requested within stability period (4 hours after collection). c. Thrombin Time and/or Reptilase Assay may also be useful in evaluation of a low functional fibrinogen.

2. Direct thrombin inhibitors may interfere with fibrinogen measurement when fibrinogen levels are less than 150 mg/dL. In this setting, the reported fibrinogen may be inaccurately decreased relative to the true value. (As an example: in a patient receiving argatroban, a reported level of 70 mg/dL would indicate that the true fibrinogen level is between 70 and 150 mg/dL). In this setting, an accurate value
cannot be determined.

3. Fibrinogen results may be inaccurate in patients who have recently received fibrinolytic therapy.

CPT Codes:

85384

LOINC Codes:

3255-7
Fibrinogen/Fibrin Degradation Products

FFDP

ORDERING

Approval Required:
Yes, contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194)

Available Stat:
No

Performing Lab:
Quest

Methodology:
Latex agglutination

Reported:
Test run Tuesday and Thursday evenings. Turnaround time: 1-4 days.

Additional Information:
For evaluation of primary fibrinogenolysis only. This test is commonly ordered in error. If test is ordered without a request for D-Dimers for DIC (FDDQ), FDDQ will be performed instead. If test is ordered with FDDQ, only FDDQ will be performed. If a patient is being evaluated for primary fibrinogenolysis please contact hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) for pre-approval of FFDP testing.

Synonyms:
- Fibrinogen degradation products
- FDP

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
1 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Obtain a current PT, PTT, Platelet Count, D-dimers for DIC (Test code FDDQ) and Fibrinogen before ordering FFDP.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
FFDP

Sendout:
Yes

Performing Lab:
Specimen Preparation:
Separate plasma at 2500 rpm for at least 10 minutes. FREEZE AT LEAST 1 mL of plasma in a plastic tube at -20°C. Order QUEST Test Code #32524P

For Brown and Toland patients, this test will be sent to LabCorp.

Preferred Volume:
1 mL plasma

Minimum Volume:
1 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:
<5 mcg/mL

Additional Information:
For evaluation of primary fibrinogenolysis only. This test is commonly ordered in error. If test is ordered without a request for D-Dimers for DIC (FDDQ), FDDQ will be performed instead. If test is ordered with FDDQ, only FDDQ will be performed. If a patient is being evaluated for primary fibrinogenolysis please contact hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) for pre-approval of FFPD testing.

ADMINISTRATIVE

CPT Codes:
85362-90

LOINC Codes:
3251-6

COMPLETE VIEW

Approval Required:
Yes, contact Hematology (Parnassus: 3-1747, Mission Bay: call 6-0194)

Available Stat:
No

Test Code:
FFDP

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Latex agglutination

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Obtain a current PT, PTT, Platelet Count, D-dimers for DIC (Test code FDDQ) and Fibrinogen before ordering FFPD.

Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
1 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Separate plasma at 2500 rpm for at least 10 minutes. FREEZE AT LEAST 1 mL of plasma in a plastic tube at -20C. Order QUEST Test Code #32524P

For Brown and Toland patients, this test will be sent to LabCorp.

Units:
µg/mL (mcg/mL)

Reference Interval:
<5 mcg/mL

Synonyms:
- Fibrinogen degradation products
- FDP

Reported:
Test run Tuesday and Thursday evenings. Turnaround time: 1-4 days.

Additional Information:
For evaluation of primary fibrinogenolysis only. This test is commonly ordered in error. If test is ordered without a request for D-Dimers for DIC (FDDQ), FDDQ will be performed instead. If test is ordered with FDDQ, only FDDQ will be performed. If a patient is being evaluated for primary fibrinogenolysis please contact hematology (Parnassus: 3-1747, Mission Bay: call 6-0194) for pre-approval of FFDP testing.

CPT Codes:
85362-90

LOINC Codes:
3251-6
FibroTest-ActiTest Panel

HCVFT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Nephelometry & Spectrophotometry
Reported:
3-5 days
Additional Information:

FibroTest and ActiTest permit the non-invasive evaluation of Hepatitis C (or B) individuals for the presence of liver fibrosis and liver inflammation, respectively. The FibroTest and ActiTest scores are calculated based on patient age, gender and concentrations of serum of y-glutamyl transferase (GGT), total bilirubin (TB), a-2 macroglobulin, haptoglobin, apolipoprotein A1 and alanine aminotransferase (ActiTest). Fibrotest and ActiTest Scores, on a scale of 0.0 to 1.0, are assigned a Metavir scale indicating the level of fibrosis or inflammation present.

The FibroTest uses the same methodology and algorithm as the FibroSure test previously sent to LabCorp.

In a comparison study, 80 samples, previously sent to LabCorp for analysis in their FibroSure assay, were used to calculate the scores through both the Quest Diagnostics server and via a secure interface on the BioPredictive server in France. The same demographic and six analyte data reported by LabCorp was entered into the calculators to determine the FibroTest® and ActiTest® scores. The scores were compared to those reported by LabCorp to determine agreement and accurate performance.

In addition, for FibroTest® an equation was available on-line (http://hepcbc.ca/fibrotest-fibrosure-in-usa/ accessed 5/30/2014) and this equation (see below) was also used to calculate a FibroTest® score. No equation was available for ActiTest®.

A total of 80 patient results were recalculated through the BioPredictive portal (http://tests.sandbox.biopredictive.com/). The data was also used to calculate the FibroTest® score using the FibroTest® equation obtained from http://hepcbc.ca/fibrotest-fibrosure-in-usa/ .

The Data demonstrated that of the 80 samples referred to Labcorp, a fibrosis score could be generated for 76 samples. FibroSure (FibroTest®) agreed with the BioPredictive server, Quest Diagnostics server and the published equation in 75, 74 and 76 samples, respectively. (Note, for 4 of the 80 samples results, the fibrosis score could not be generated because analytes fell outside acceptable parameters for the algorithm.) In the samples that showed a difference, the scores were within 0.01 of the Labcorp score and in only one case (0.72 vs. 0.73) did this difference cause a categorical change in the Metavir score, namely F3 to F3-F4. Of the 73 samples with a Labcorp Necroinflammatory Activity (ActiTest®) Score (of the 80 TSO samples 5 were not calculated and 2 were not ordered), 72 and 73 , respectively, agreed with the scores calculated by BioPredictive and Quest Diagnostics. The one sample that differed in the BioPredictive calculation was lower by 0.01, but did not change the Metavir activity score.

Between BioPredictive and Quest Diagnostics there was a 97% (77/80) and 99% (79/80) agreement between the FibroTest® and ActiTest® scores, respectively. Differences were all 0.01 and in only one patient did this result in a different Metavir score, F3 (0.72) vs F3-F4 (0.73), respectively. The slight difference in scores is most likely a reflection of rounding that occurs in the conversion of units for the total bilirubin analyte from mg/dL to umol/L in the algorithm.

Source: Dr. Stanley Naides, Quest, Inc.

Synonyms:
- HCV Fibrosure
- Cirrhosis
- Hepatitis C
- HCV
- Hepatic fibrosis
Patient Preparation:
  Overnight fasting is preferred
Sample Type:
  Serum
Collect:
  Gold top or Red top
Amount to Collect:
  7 mL blood
Preferred Volume:
  3.5 mL serum
Minimum Volume:
  2 mL serum
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 5 days, frozen at -20C 5 days, frozen at -70C 28 days
Unacceptable Conditions:
  Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis
Rejection Criteria:
  Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis

PROCESSING

Test Code:
  HCVFT
Sendout:
  Yes
Performing Lab:
  Quest
Specimen Preparation:
  Aliquot and freeze serum, ship frozen to China basin. Order Quest test code 92688.
Preferred Volume:
  3.5 mL serum
Minimum Volume:
  2 mL serum
Unacceptable Conditions:
  Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis
Rejection Criteria:
  Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 5 days, frozen at -20C 5 days, frozen at -70C 28 days

RESULT INTERPRETATION

Units:
  See normal ranges
Reference Interval:

  Alpha-2-Macroglobulin
  Age Normal
  <18 years Not established
  >= 18 years 106-279 mg/dL
Haptoglobin

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18 years</td>
<td>Not established</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>94-176 mg/dL</td>
</tr>
</tbody>
</table>

Apolipoprotein A1

<table>
<thead>
<tr>
<th>Sex/age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18 years</td>
<td>Not established</td>
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<tr>
<td>Male &gt;= 18 years</td>
<td>94-176 mg/dL</td>
</tr>
<tr>
<td>Female &gt;= 18 years</td>
<td>101-198 mg/dL</td>
</tr>
</tbody>
</table>

Total Bilirubin

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-9 years</td>
<td>0.2-0.8 mg/dL</td>
</tr>
<tr>
<td>10-19 years</td>
<td>0.2-1.1 mg/dL</td>
</tr>
<tr>
<td>&gt;= 20 years</td>
<td>0.2-1.2 mg/dL</td>
</tr>
</tbody>
</table>

Gamma Glutamyl Transpeptidase (GGT)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2-12 years</td>
<td>3-22 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>13-15 years</td>
<td>8-32 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>16-19 years</td>
<td>9-31 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>20-29 years</td>
<td>3-70 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>30-39 years</td>
<td>3-90 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>40-54 years</td>
<td>3-95 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>55-59 years</td>
<td>3-85 U/L</td>
</tr>
<tr>
<td>Male</td>
<td>&gt;= 60 years</td>
<td>3-65 U/L</td>
</tr>
<tr>
<td>Female</td>
<td>2-12 years</td>
<td>3-22 U/L</td>
</tr>
<tr>
<td>Female</td>
<td>13-15 years</td>
<td>7-18 U/L</td>
</tr>
<tr>
<td>Female</td>
<td>16-19 years</td>
<td>6-26 U/L</td>
</tr>
<tr>
<td>Female</td>
<td>20-29 years</td>
<td>3-40 U/L</td>
</tr>
</tbody>
</table>
Female 30-39 years 3-50 U/L
Female 40-49 years 3-55 U/L
Female 50-59 years 3-70 U/L
Female >= 60 years 3-65 U/L

Alanine Aminotransferase (ALT)

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3 years</td>
<td>5-30 U/L</td>
<td>5-30 U/L</td>
</tr>
<tr>
<td>4-12 years</td>
<td>8-30 U/L</td>
<td>8-24 U/L</td>
</tr>
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<td>13-15 years</td>
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</tr>
<tr>
<td>16-19 years</td>
<td>8-46 U/L</td>
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Additional Information:

FibroTest and ActiTest permit the non-invasive evaluation of Hepatitis C (or B) individuals for the presence of liver fibrosis and liver inflammation, respectively. The FibroTest and ActiTest scores are calculated based on patient age, gender and concentrations of serum y-glutamyl transferase (GGT), total bilirubin (TB), a-2 macroglobulin, haptoglobin, apolipoprotein A1 and alanine aminotransferase (ActiTest). Fibrotest and ActiTest Scores, on a scale of 0.0 to 1.0, are assigned a Metavir scale indicating the level of fibrosis or inflammation present.

The FibroTest uses the same methodology and algorithm as the FibroSure test previously sent to LabCorp.

In a comparison study, 80 samples, previously sent to LabCorp for analysis in their FibroSure assay, were used to calculate the scores through both the Quest Diagnostics server and via a secure interface on the BioPredictive server in France. The same demographic and six analyte data reported by LabCorp was entered into the calculators to determine the FibroTest² and ActiTest² scores. The scores were compared to those reported by LabCorp to determine agreement and accurate performance.

In addition, for FibroTest² an equation was available on-line (http://hepcbc.ca/fibrotest-fibrosure-in-usa/ accessed 5/30/2014) and this equation (see below) was also used to calculate a FibroTest² score. No equation was available for ActiTest².

A total of 80 patient results were recalculated through the BioPredictive portal (http://tests.sandbox.biopredictive.com/). The data was also used to calculate the FibroTest² score using the FibroTest² equation obtained from http://hepcbc.ca/fibrotest-fibrosure-in-usa/.

The Data demonstrated that of the 80 samples referred to Labcorp, a fibrosis score could be generated for 76 samples. FibroSure (FibroTest²) agreed with the BioPredictive server, Quest Diagnostics server and the published equation in 75, 74 and 76 samples, respectively. (Note, for 4 of the 80 samples results, the fibrosis score could not be generated because analytes fell outside acceptable parameters for the algorithm.) In the samples that showed a difference, the scores were within 0.01 of the Labcorp score and in only one case (0.72 vs. 0.73) did this difference cause a categorical change in the Metavir score, namely F3 to F3-F4. Of the 73 samples with a Labcorp Necroinflammatory Activity (ActiTest²) Score (of the 80 TSO samples 5 were not calculated and 2 were not ordered), 72 and 73 , respectively, agreed with the scores calculated by BioPredictive and Quest Diagnostics. The one sample that differed in the BioPredictive calculation was lower by 0.01, but did not change the Metavir activity score.

Between BioPredictive and Quest Diagnostics there was a 97% (77/80) and 99% (79/80) agreement between the FibroTest² and ActiTest² scores, respectively. Differences were all 0.01 and in only one patient did this result in a different Metavir score, F3 (0.72) vs F3-F4 (0.73), respectively. The slight difference in scores is most likely a reflection of rounding that occurs in the conversion of units for the total bilirubin analyte from mg/dL to umol/L in the algorithm.

Source: Dr. Stanley Naides, Quest, Inc.
CPT Codes:
81599-90

COMPLETE VIEW

Available Stat:
No
Test Code:
HCVFT
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Nephelometry & Spectrophotometry
Patient Preparation:
Overnight fasting is preferred
Collect:
Gold top or Red top
Amount to Collect:
7 mL blood
Sample Type:
Serum
Preferred Volume:
3.5 mL serum
Minimum Volume:
2 mL serum
Rejection Criteria:
Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis
Unacceptable Conditions:
Patient < 2 years old, gross hemolysis or lipemia, QNS for one or more analysis
Specimen Preparation:
Aliquot and freeze serum, ship frozen to China basin. Order Quest test code 92688.
Units:
See normal ranges
Reference Interval:

Alpha-2-Macroglobulin
Age Normal
<18 years Not established
>= 18 years 106-279 mg/dL

Haptoglobin
Age Normal range
<18 years Not established
>= 18 years 94-176 mg/dL
**Apolipoprotein A1**

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**Total Bilirubin**

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**Gamma Glutamyl Transpeptidase (GGT)**

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<td>Male 20-29 years</td>
<td>3-70 U/L</td>
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<td>3-90 U/L</td>
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</tr>
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<td></td>
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<tr>
<td>Male 55-59 years</td>
<td>3-85 U/L</td>
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<td>Male &gt;= 60 years</td>
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### Alanine Aminotransferase (ALT)

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<td>6-29 U/L</td>
</tr>
</tbody>
</table>

### Synonyms:
- HCV FibroSure
- Cirrhosis
- Hepatitis C
- HCV
- Hepatic fibrosis

### Stability (from collection to initiation):
Room temperature 1 day, refrigerated 5 days, frozen at -20°C 5 days, frozen at -70°C 28 days

### Reported:
3-5 days

### Additional Information:

FibroTest and ActiTest permit the non-invasive evaluation of Hepatitis C (or B) individuals for the presence of liver fibrosis and liver inflammation, respectively. The FibroTest and ActiTest scores are calculated based on patient age, gender and concentrations of serum of y-glutamyl transferase (GGT), total bilirubin (TB), a-2 macroglobulin, haptoglobin, apolipoprotein A1 and alanine aminotransferase (ActiTest). Fibrotest and ActiTest Scores, on a scale of 0.0 to 1.0, are assigned a Metavir scale indicating the level of fibrosis or inflammation present.

The FibroTest uses the same methodology and algorithm as the FibroSure test previously sent to LabCorp.

In a comparison study, 80 samples, previously sent to LabCorp for analysis in their FibroSure assay, were used to calculate the scores through both the Quest Diagnostics server and via a secure interface on the BioPredictive server in France. The same demographic and six analyte data reported by LabCorp was entered into the calculators to determine the FibroTest and ActiTest scores. The scores were compared to those reported by LabCorp to determine agreement and accurate performance.

In addition, for FibroTest an equation was available on-line ([http://hepcbc.ca/fibrotest-fibrosure-in-usa/ accessed 5/30/2014](http://hepcbc.ca/fibrotest-fibrosure-in-usa/)) and this equation (see below) was also used to calculate a FibroTest score. No equation was available for ActiTest.

A total of 80 patient results were recalculated through the BioPredictive portal ([http://tests.sandbox.biopredictive.com/](http://tests.sandbox.biopredictive.com/)). The data was also used to calculate the FibroTest score using the FibroTest equation obtained from [http://hepcbc.ca/fibrotest-fibrosure-in-usa/](http://hepcbc.ca/fibrotest-fibrosure-in-usa/).

The Data demonstrated that of the 80 samples referred to Labcorp, a fibrosis score could be generated for 76 samples. FibroSure (FibroTest) agreed with the BioPredictive server, Quest Diagnostics server and the published equation in 75, 74 and 76 samples, respectively. (Note, for 4 of the 80 samples results, the fibrosis score could not be generated because analytes fell outside acceptable parameters for the algorithm.) In the samples that showed a difference, the scores were within 0.01 of the Labcorp score and in only one case (0.72 vs. 0.73) did this difference cause a categorical change in the Metavir score, namely F3 to F3-F4. Of the 73 samples with a Labcorp Necroinflammatory Activity (ActiTest) Score (of the 80 TSO samples 5 were not calculated and 2 were not ordered), 72 and 73 , respectively, agreed with the scores calculated by BioPredictive and Quest Diagnostics. The one sample that differed in the BioPredictive calculation was lower by 0.01, but did not change the Metavir activity score.

Between BioPredictive and Quest Diagnostics there was a 97% (77/80) and 99% (79/80) agreement between the FibroTest and ActiTest scores, respectively. Differences were all 0.01 and in only one patient did this result in a different Metavir score, F3 (0.72) vs F3-F4 (0.73), respectively. The slight difference in scores is most likely a reflection of rounding that occurs in the conversion of units for the total bilirubin analyte from mg/dL to umol/L in the algorithm.
Source: Dr. Stanley Naides, Quest, Inc.

CPT Codes:
81599-90
Filaria IgG4 Antibody
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: ELISA
Reported: Set up once per week. Turnaround 7-12 days

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top acceptable)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.8 mL serum
Stability (from collection to initiation): Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate sample. Order Quest # 34168X.
Preferred Volume: 1 mL serum
Minimum Volume: 0.8 mL serum
Stability (from collection to initiation): Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Reference Interval: <1.00

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
86682-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
ELISA

Collect:
Red top (Gold top acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.8 mL serum

Specimen Preparation:
Refrigerate sample. Order Quest # 34168X.

Reference Interval:
<1.00

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
Set up once per week. Turnaround 7-12 days

CPT Codes:
86682-90
First Trimester Screen
FTS

ORDERING

Available Stat:
No
Performing Lab:
Western Clinical Laboratory, Inc
Reported:
10 days from time of receipt at Western Clinical laboratories
Additional Information:
For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.
Synonyms:
- Triple screen
- Obstetrical screen
- Down's syndrome screen
- Neural tube defect screen
- Alpha-fetoprotein
- alpha-fetoglobulin
- AFP3
- E3
- Expanded AFP screening
- Maternal serum screen
- MSS3
- Maternal tests
- Prenatal screening

COLLECTION

Patient Preparation:
Have the patient read the Program booklet and sign the consent form. The consent is to remain with the clinic.
Sample Type:
Serum is used for testing but the entire unopened tube must be sent.
Collect:
Special SST supplied in Prenatal Screening test kit.
Amount to Collect:
3.5 mL blood
Preferred Volume:
3.5 mL blood (1.5 mL serum)
Minimum Volume:
3.5 mL blood (1.5 mL serum)
Remarks:
Prior to collection:
Send the remainder of the Program form with the patient to have the sample collected between 10 weeks to 13 weeks 6 days of pregnancy (First Trimester). Include a completed Routine Laboratory requisition listing 'First Trimester Screen' in the lower right corner of the form.
To allow correct billing, provide Medi-Cal information, if applicable. Otherwise, enclose a copy of insurance card.
At the time of collection:
Complete Part B (green) at the bottom of form.
Draw the patient's blood using the 3.5 mL serum separator tube supplied in the program kit.

Apply the white collection label from the top of this page to the tube with the patient's name and collection date.

**Rejection Criteria:**
1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolyzed
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1/2 hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF
11. Patient last name or TRF number is absent from either tube or TRF
12. Different middle initials on tube vs TRF

**PROCESSING**

**Test Code:**
FTS

**Test Group:**
Prenatal screening

**Sendout:**
Yes

**Performing Lab:**
Western Clinical Laboratory, Inc

**Specimen Preparation:**
Let whole blood stand for 1/2 hour to 1 hour after time of collection before centrifuging to aid clot formation. Centrifuge tube and place the centrifuged tube in the blue plastic tray. Place plastic tray in the absorbent pouch. Seal the pouch.

Place the white copy of the completed form, the insurance information in the red mailing box.

Remove the Business Reply label from the top of the form and place it on the red box, mail the same day, if possible.

If specimen is sent by courier, follow the courier's instructions for packaging.

**Preferred Volume:**
3.5 mL blood (1.5 mL serum)

**Minimum Volume:**
3.5 mL blood (1.5 mL serum)

**Rejection Criteria:**
1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolyzed
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1/2 hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF
11. Patient last name or TRF number is absent from either tube or TRF
12. Different middle initials on tube vs TRF

**RESULT INTERPRETATION**

**Additional Information:**
For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.

ADMINISTRATIVE

CPT Codes:
The Prenatal Screening Billing Code is assigned by the Program upon request.

COMPLETE VIEW

Available Stat: No
Test Code: FTS
Test Group: Prenatal screening
Performing Lab: Western Clinical Laboratory, Inc
Sendout: Yes

Patient Preparation:
Have the patient read the Program booklet and sign the consent form. The consent is to remain with the clinic.

Remarks:
Prior to collection:
Send the remainder of the Program form with the patient to have the sample collected between 10 weeks to 13 weeks 6 days of pregnancy (First Trimester). Include a completed Routine Laboratory requisition listing 'First Trimester Screen' in the lower right corner of the form.

To allow correct billing, provide Medi-Cal information, if applicable. Otherwise, enclose a copy of insurance card.

At the time of collection:
Complete Part B (green) at the bottom of form.

Draw the patient's blood using the 3.5 mL serum separator tube supplied in the program kit.

Apply the white collection label from the top of this page to the tube with the patient's name and collection date.

Collect:
Special SST supplied in Prenatal Screening test kit.

Amount to Collect:
3.5 mL blood

Sample Type:
Serum is used for testing but the entire unopened tube must be sent.

Preferred Volume:
3.5 mL blood (1.5 mL serum)

Minimum Volume:
3.5 mL blood (1.5 mL serum)

Rejection Criteria:
1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolized
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1 hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF
11. Patient last name or TRF number is absent from either tube or TRF 12. Different middle initials on tube vs TRF

**Specimen Preparation:**

Let whole blood stand for 1/2 hour to 1 hour after time of collection before centrifuging to aid clot formation. Centrifuge tube and place the centrifuged tube in the blue plastic tray. Place plastic tray in the absorbent pouch. Seal the pouch.

Place the white copy of the completed form, the insurance information in the red mailing box.

Remove the Business Reply label from the top of the form and place it on the red box, mail the same day, if possible.

If specimen is sent by courier, follow the courier's instructions for packaging.

**Synonyms:**

- Triple screen
- Obstetrical screen
- Down’s syndrome screen
- Neural tube defect screen
- Alpha-fetoprotein
- alpha-fetoglobulin
- AFP3
- E3
- Expanded AFP screening
- Maternal serum screen
- MSS3
- Maternal tests
- Prenatal screening

**Reported:**

10 days from time of receipt at Western Clinical laboratories

**Additional Information:**

For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.

**CPT Codes:**

The Prenatal Screening Billing Code is assigned by the Program upon request.
### Flecainide

**FLEC**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- LC/MS/MS

**Reported:**
- Test run Tuesday, Thursday, Saturday. Turnaround time: 2-5 days.

**Synonyms:**
- Tambocor

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top

**Amount to Collect:**
- 8 mL blood

**Preferred Volume:**
- 4 mL serum

**Minimum Volume:**
- 1.5 mL serum

**Remarks:**
- Do not use serum separator tube

**Unacceptable Conditions:**
- Collected in Gold top

### PROCESSING

**Test Code:**
- FLEC

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Refrigerate. Order Quest # 36384P.

**Preferred Volume:**
- 4 mL serum

**Minimum Volume:**
- 1.5 mL serum

**Unacceptable Conditions:**
- Collected in Gold top

### RESULT INTERPRETATION

**Units:**
mg/L

**Reference Interval:**
Therapeutic: 0.20-1.00 mg/L
Toxic: > 1.00 mg/L

**Critical Values:**
Quest Priority-1: >= 1.0 mg/L

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**ADMINISTRATIVE**

**CPT Codes:**
- 80299-90

**LOINC Codes:**
- 3638-4

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**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
FLEC

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
LC/MS/MS

**Remarks:**
Do not use serum separator tube

**Collect:**
Red top

**Amount to Collect:**
8 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
4 mL serum

**Minimum Volume:**
1.5 mL serum

**Unacceptable Conditions:**
Collected in Gold top

**Specimen Preparation:**
Refrigerate. Order Quest # 36384P.

**Units:**
mg/L

**Reference Interval:**
Therapeutic: 0.20-1.00 mg/L
Toxic: > 1.00 mg/L

**Critical Values:**
Quest Priority-1: >= 1.0 mg/L

**Synonyms:**
- Tambocor

**Reported:**
Test run Tuesday, Thursday, Saturday. Turnaround time: 2-5 days.

**CPT Codes:**
80299-90
LOINC Codes:
3638-4
FLT3 Mutations

FLT3

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Once per week, or as needed

Methodology:
Fluorescent PCR, restriction enzyme digestion, capillary electrophoresis, peak integration to determine mutant-to-normal ITD ratios.

Reported:
Routine cases reported within 10-14 days. Expedited cases will be reported within 7 days upon request.

Additional Information:
FLT3 is a receptor tyrosine kinase expressed on the surface of many types of hematopoietic stem and progenitor cells. It is mutated in approximately one-third of AML patients. Internal tandem in frame duplications (ITD) within its cytoplasmic domain lead to its constitutive activation. ITD mutations represent the most common type of FLT3 mutations and occur in approximately 23% of adult AML cases. Another FLT3 mutation, termed D835, consists of an amino acid substitution in the FLT3 kinase domain and is found in approximately 12% of AML cases. Cytogenetically normal AML without the FLT3-ITD mutation constitutes a more favorable outcome than cytogenetically normal AML with a FLT3-ITD mutation.

This test will determine the presence or absence of the FLT3 ITD and D835 mutations. In addition, it will report the ratio of mutant to normal ITD alleles, which can be used as a guide for the combination treatment of FLT3-positive AML with chemotherapy and the multikinase inhibitor midostaurin.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:
- FLT-3
- fms-related tyrosine kinase 3
- fetal liver kinase-2
- FLT3-ITD
- FLT3-D835

COLLECTION

Sample Type:
Blood, bone marrow aspirate, FFPE sections

Collect:
Lavender top (EDTA)

Amount to Collect:
See Preferred Volume

Preferred Volume:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&Estained section

Minimum Volume:
Blood: 2 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&Estained section
**Remarks:**
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

**PROCESSING**

**Test Code:**
FLT3

**Test Group:**
AML molecular markers

**Performing Lab:**
Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

**Preferred Volume:**
Blood: 5 mL
Bone marrow aspirate: 3 mL

FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&Estained section

**Minimum Volume:**
Blood: 2 mL
Bone marrow aspirate: 3 mL

FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&Estained section

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
FLT3 is a receptor tyrosine kinase expressed on the surface of many types of hematopoietic stem and progenitor cells. It is mutated in approximately one-third of AML patients. Internal tandem in frame duplications (ITD) within its cytoplasmic domain lead to its constitutive activation. ITD mutations represent the most common type of FLT3 mutations and occur in approximately 23% of adult AML cases. Another FLT3 mutation, termed D835, consists of an amino acid substitution in the FLT3 kinase domain and is found in approximately 12% of AML cases. Cytogenetically normal AML without the FLT3-ITD mutation constitutes a more favorable outcome than cytogenetically normal AML with a FLT3-ITD mutation.

This test will determine the presence or absence of the FLT3 ITD and D835 mutations. In addition, it will report the ratio of mutant to normal ITD alleles, which can be used as a guide for the combination treatment of FLT3-positive AML with chemotherapy and the multikinase inhibitor midostaurin.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**ADMINISTRATIVE**

**CPT Codes:**
81245, 81246

**LDT or Modified FDA:**
Yes
Available Stat:
No

Test Code:
FLT3

Test Group:
AML molecular markers

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Once per week, or as needed

Methodology:
Fluorescent PCR, restriction enzyme digestion, capillary electrophoresis, peak integration to determine mutant-to-normal ITD ratios.

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top (EDTA)

Amount to Collect:
See Preferred Volume

Sample Type:
Blood, bone marrow aspirate, FFPE sections

Preferred Volume:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section

Minimum Volume:
Blood: 2 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&E stained section

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

Reference Interval:
Negative

Synonyms:
- FLT-3
- fms-related tyrosine kinase 3
- fetal liver kinase-2
- FLT3-ITD
- FLT3-D835

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

Reported:
Routine cases reported within 10-14 days. Expedited cases will be reported within 7 days upon request.

Additional Information:
FLT3 is a receptor tyrosine kinase expressed on the surface of many types of hematopoietic stem and progenitor cells. It is mutated in approximately one-third of AML patients. Internal tandem in frame duplications (ITD) within its cytoplasmic domain lead to its constitutive activation. ITD mutations represent the most common type of FLT3 mutations and occur in approximately 23% of adult AML cases. Another FLT3 mutation, termed D835, consists of an amino acid substitution in the FLT3 kinase domain and is found in approximately 12% of AML cases. Cytogenetically normal AML without the FLT3-ITD mutation constitutes a more favorable outcome than cytogenetically normal AML with a FLT3-ITD mutation.

This test will determine the presence or absence of the FLT3 ITD and D835 mutations. In addition, it will report the ratio of mutant to normal ITD alleles, which can be used as a guide for the combination treatment of FLT3-positive AML with chemotherapy and the multikinase inhibitor midostaurin.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or

Printed 06/07/19
Test information subject to change
approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**CPT Codes:**
- 81245, 81246

**LDT or Modified FDA:**
- Yes
Fluconazole

**ORDERING**

**Performing Lab:**
Quest

**Methodology:**
High Performance Liquid Chromatography (HPLC)

**Reported:**
4-6 days

**Additional Information:**
Fluconazole is commonly used in the treatment of various types of fungal infections. Due to the fact it is readily soluble in water it can be administered in relatively large amounts to patients. Measurement of serum drug levels may be helpful to optimize drug dosing regimens, particularly where there is non-compliance, concern about drug interactions, pharmacokinetic variability, or suspected toxicity.

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red-top

**Amount to Collect:**
4 mL (blood)

**Preferred Volume:**
2 mL (serum)

**Minimum Volume:**
1 mL (serum)

**Stability (from collection to initiation):**
- Room temperature: 7 days
- Refrigerated: 7 days
- Frozen: 30 days

**Rejection Criteria:**
- Serum Separator Tubes (SST®) • Other body fluids • Other specimen types

**PROCESSING**

**Test Code:**
FLUC

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Aliquot and freeze. Send sample to CB frozen. Order Quest test code 34882

**Preferred Volume:**
2 mL (serum)

**Minimum Volume:**
1 mL (serum)

**Rejection Criteria:**
- Serum Separator Tubes (SST®) • Other body fluids • Other specimen types

**Stability (from collection to initiation):**
- Room temperature: 7 days
- Refrigerated: 7 days
- Frozen: 30 days
RESULT INTERPRETATION

Units:
mcg/mL

Reference Interval:
<0.5 mcg/mL

Additional Information:
Fluconazole is commonly used in the treatment of various types of fungal infections. Due to the fact it is readily soluble in water it can be administered in relatively large amounts to patients. Measurement of serum drug levels may be helpful to optimize drug dosing regimens, particularly where there is non-compliance, concern about drug interactions, pharmacokinetic variability, or suspected toxicity.

ADMINISTRATIVE

CPT Codes:
80299-90

LOINC Codes:
10987-6

COMPLETE VIEW

Test Code:
FLUC

Performing Lab:
Quest

Sendout:
Yes

Methodology:
High Performance Liquid Chromatography (HPLC)

Collect:
Red-top

Amount to Collect:
4 mL (blood)

Sample Type:
Serum

Preferred Volume:
2 mL (serum)

Minimum Volume:
1 mL (serum)

Rejection Criteria:
Serum Separator Tubes (SST®) • Other body fluids • Other specimen types

Specimen Preparation:
Aliquot and freeze. Send sample to CB frozen. Order Quest test code 34882

Units:
mcg/mL

Reference Interval:
<0.5 mcg/mL

Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: 7 days
Frozen: 30 days

Reported:
4-6 days

Additional Information:
Fluconazole is commonly used in the treatment of various types of fungal infections. Due to the fact it is readily soluble in water it can be
administered in relatively large amounts to patients. Measurement of serum drug levels may be helpful to optimize drug dosing regimens, particularly where there is non-compliance, concern about drug interactions, pharmacokinetic variability, or suspected toxicity.

**CPT Codes:**
80299-90

**LOINC Codes:**
10987-6
Folate, RBC
MOLT, RBCFB

ORDERING

Ordering Recommendations:  
Aids in detection of folate deficiency.
Performing Lab:  
ARUP
Performed:  
Sun-Sat
Methodology:  
Quantitative Chemiluminescent Immunoassay
Reported:  
Within 24 hours
Additional Information:  
In order to obtain the hematocrit needed to calculate the result of the assay, the lab will order a hematocrit if it's not available on the same sample or a sample collected within ±24 hours.

Serum test offered in-house (see test SFOL).
Synonyms:  
- Folate, Red Blood Cell
- Folate, Red Cell
- Folic Acid
- RBC Folate
- Vitamin B9
- RBCFB

COLLECTION

Collect:  
Lavender (EDTA) or pink (K₂EDTA).
Minimum Volume:  
1 mL blood
Remarks:  
Hematocrit must be performed and indicated on the test request form. If the patient has not received a transfusion or experienced excessive bleeding between the RBC folate draw and the hematocrit draw, any hematocrit drawn within 24 hours of the RBC folate draw is acceptable.

Stability (from collection to initiation):  
Ambient: 2 hours; Refrigerated: 4 hours; Frozen: 2 months
Storage/Transport Temperature:  
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.
Unacceptable Conditions:  
Non-frozen specimens. Clotted specimens.

PROCESSING

Test Code:  
MOLT (APeX)
RBCFB (SunQuest)
ARUP Test Code:  
0070385
Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Protect from light during collection, storage, and shipment. Mix specimen well. Transfer 1 mL whole blood to an ARUP Amber Transport Tube.

Additional Processing Instructions:
Order test code RBCFB in Sunquest. Mix specimen well. Transfer 1 mL whole blood to an ARUP Amber Transport Tube and freeze at -20C, then send aliquot with RBCF label to China Basin Sendouts (Order ARUP test code 0070385). Store primary tube in refrigerator. Check for hematocrit (if needed, order HCTF and give primary tube to Hematology).

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Non-frozen specimens. Clotted specimens.

Stability (from collection to initiation):
Ambient: 2 hours; Refrigerated: 4 hours; Frozen: 2 months

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
Greater than or equal to 366 ng/mL

Additional Information:
In order to obtain the hematocrit needed to calculate the result of the assay, the lab will order a hematocrit if it's not available on the same sample or a sample collected within ±24 hours.

Serum test offered in-house (see test SFOL).

ADMINISTRATIVE

CPT Codes:
82747

LOINC:
- 2283-0
- 20570-8

COMPLETE VIEW

Ordering Recommendations:
Aids in detection of folate deficiency.

Test Code:
MOLT (APeX)
RBCFB (SunQuest)

ARUP Test Code:
0070385

Performing Lab:
ARUP
Sendout:
Yes
Performed:
Sun-Sat
Methodology:
Quantitative Chemiluminescent Immunoassay

Remarks:
Hematocrit must be performed and indicated on the test request form. If the patient has not received a transfusion or experienced excessive bleeding between the RBC folate draw and the hematocrit draw, any hematocrit drawn within 24 hours of the RBC folate draw is acceptable.

Collect:
Lavender (EDTA) or pink (K$_2$EDTA).

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Non-frozen specimens. Clotted specimens.

Specimen Preparation:
Protect from light during collection, storage, and shipment. Mix specimen well. Transfer 1 mL whole blood to an ARUP Amber Transport Tube.

Additional Processing Instructions:
Order test code RBCFB in Sunquest. Mix specimen well. Transfer 1 mL whole blood to an ARUP Amber Transport Tube and freeze at -20C, then send aliquot with RBCF label to China Basin Sendouts (Order ARUP test code 0070385). Store primary tube in refrigerator. Check for hematocrit (if needed, order HCTF and give primary tube to Hematology).

Reference Interval:
Greater than or equal to 366 ng/mL

Synonyms:
- Folate, Red Blood Cell
- Folate, Red Cell
- Folic Acid
- RBC Folate
- Vitamin B9
- RBCFB

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Stability (from collection to initiation):
Ambient: 2 hours; Refrigerated: 4 hours; Frozen: 2 months

Reported:
Within 24 hours

Additional Information:
In order to obtain the hematocrit needed to calculate the result of the assay, the lab will order a hematocrit if it's not available on the same sample or a sample collected within ±24 hours.

Serum test offered in-house (see test SFOL).

CPT Codes:
82747

LOINC:
- 2283-0
- 20570-8
Folate, serum
SFOL

ORDERING

Ordering Recommendations:
Effective 1/10/18, Serum Folate will be the routine test available for diagnosing folate deficiency instead of RBC Folate. If RBC Folate is required, order as MOLT for sendout testing to ARUP Lab (Collect Lavender (EDTA) or pink (K2EDTA)).

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Monday and Thursday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1 - 5 days

Additional Information:
To convert ng/mL to nmol/L (SI units) multiply by 2.265.

The ARCHITECT Folate assay is standardized to the World Health Organization (WHO) Serum Folate International Standard 03/178.

Serum specimens from patients with renal impairment or failure (including dialysis patients) may exhibit varying degrees of falsely depressed folate values. Therefore to evaluate patients with renal impairment or failure who also exhibit low folate levels, it is recommended that low ARCHITECT Folate values be confirmed by an alternate folate method.

Methotrexate, aminopterin, and folinic acid (Leucovorin) are chemotherapeutic agents whose molecular structures are similar to folate. These agents cross react with folate binding protein in folate assays. Do not use the ARCHITECT Folate assay or other assays employing folate binding proteins for patients using these drugs.

If RBC Folate is required, order as MOLT for sendout testing to ARUP Lab (Collect Lavender (EDTA) or pink (K2EDTA)).

Synonyms:
- Folic acid

COLLECTION

Patient Preparation:
An overnight fast is recommended prior to specimen collection for reference ranges to apply.

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 30 days

Avoid more than 3 freeze/thaw cycles.

PROCESSING
Test Code:
SFOL

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 30 days

Avoid more than 3 freeze/thaw cycles.

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:

<table>
<thead>
<tr>
<th>RESULT (ng/mL)</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2</td>
<td>LOW. Consistent with folate deficiency</td>
</tr>
<tr>
<td>2 - 4</td>
<td>BORDERLINE. Additional testing may be indicated depending on the clinical circumstances.</td>
</tr>
<tr>
<td>&gt; 4</td>
<td>NORMAL. Suggests folate is not deficient, unless the individual has recently consumed a folate-containing meal or supplement. In such cases, RBC folate can be obtained. The RBC folate level is not needed in routine testing because it does not provide additional information and is more costly to obtain.</td>
</tr>
</tbody>
</table>

If patient was not fasting, the normal ranges may not apply.

Reference range adopted from https://www.uptodate.com and verified in-house with lab donor samples.

Additional Information:
To convert ng/mL to nmol/L (SI units) multiply by 2.265.

The ARCHITECT Folate assay is standardized to the World Health Organization (WHO) Serum Folate International Standard 03/178.

Serum specimens from patients with renal impairment or failure (including dialysis patients) may exhibit varying degrees of falsely depressed folate values. Therefore to evaluate patients with renal impairment or failure who also exhibit low folate levels, it is recommended that low ARCHITECT Folate values be confirmed by an alternate folate method.

Methotrexate, aminopterin, and folinic acid (Leucovorin) are chemotherapeutic agents whose molecular structures are similar to folate. These agents cross react with folate binding protein in folate assays. Do not use the ARCHITECT Folate assay or other assays employing folate binding proteins for patients using these drugs.

If RBC Folate is required, order as MOLT for sendout testing to ARUP Lab (Collect Lavender (EDTA) or pink (K2EDTA)).

ADMINISTRATIVE

CPT Codes:
82746

LDT or Modified FDA:
2284-8
Available Stat: No

Ordering Recommendations:
Effective 1/10/18, Serum Folate will be the routine test available for diagnosing folate deficiency instead of RBC Folate. If RBC Folate is required, order as MOLT for sendout testing to ARUP Lab (Collect Lavender (EDTA) or pink (K2EDTA)).

Test Code:
SFOL

Performing Lab:
China Basin Chemistry

Performed:
Monday and Thursday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Patient Preparation:
An overnight fast is recommended prior to specimen collection for reference ranges to apply.

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Units:
ng/mL

Reference Interval:

<table>
<thead>
<tr>
<th>RESULT</th>
<th>INTERPRETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 ng/mL</td>
<td>LOW. Consistent with folate deficiency</td>
</tr>
<tr>
<td>2 -4 ng/mL</td>
<td>BORDERLINE. Additional testing may be indicated depending on the clinical circumstances.</td>
</tr>
<tr>
<td>&gt; 4 ng/mL</td>
<td>NORMAL. Suggests folate is not deficient, unless the individual has recently consumed a folate-containing meal or supplement. In such cases, RBC folate can be obtained. The RBC folate level is not needed in routine testing because it does not provide additional information and is more costly to obtain.</td>
</tr>
</tbody>
</table>

If patient was not fasting, the normal ranges may not apply.

Reference range adopted from https://www.uptodate.com and verified in-house with lab donor samples.

Synonyms:
- Folic acid

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 30 days

Avoid more than 3 freeze/thaw cycles.

Reported:
1 - 5 days

Additional Information:
To convert ng/mL to nmol/L (SI units) multiply by 2.265.

The ARCHITECT Folate assay is standardized to the World Health Organization (WHO) Serum Folate International Standard 03/178.

Serum specimens from patients with renal impairment or failure (including dialysis patients) may exhibit varying degrees of falsely depressed folate values. Therefore to evaluate patients with renal impairment or failure who also exhibit low folate levels, it is
recommended that low ARCHITECT Folate values be confirmed by an alternate folate method.

Methotrexate, aminopterin, and folinic acid (Leucovorin) are chemotherapeutic agents whose molecular structures are similar to folate. These agents cross react with folate binding protein in folate assays. Do not use the ARCHITECT Folate assay or other assays employing folate binding proteins for patients using these drugs.

If RBC Folate is required, order as MOLT for sendout testing to ARUP Lab (Collect Lavender (EDTA) or pink (K2EDTA).

CPT Codes:
82746

LDT or Modified FDA:
2284-8
Follicle Stimulating Hormone
FSH

ORDERING

Ordering Recommendations:
This assay is suitable for use in adult patients to assess general endocrine function. Samples from younger patients are referred to a reference laboratory employing a more sensitive assay (see entry for FSH, Ultrasensitive).

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Thursday, Sunday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1-3 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 26% lower than the Centaur method. Please note that the reference ranges have changed.

This assay standardization is traceable to the World Health Organization (WHO) FSH 1st International Standard, (92/510).

Medi-Cal Medical Necessity Policy applies.

Synonyms:
- FSH
- follitropin
- gonadotropin tests

COLLECTION

Sample Type:
Serum

Collect:
Gold or Red top

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

PROCESSING

Test Code:
FSH

Test Group:
FSH
Performing Lab: 
China Basin Chemistry
Specimen Preparation:
Aliquot and freeze serum at -20 C.
Preferred Volume:
0.3 mL serum
Minimum Volume:
0.15 mL serum
Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months
If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.
Avoid multiple freeze-thaw cycles.

RESULT INTERPRETATION

Units:
IU/L
Reference Interval:
Adult males (>= 18 years): 1.0 - 12.0 IU/L

Adult females (>= 18 years):

<table>
<thead>
<tr>
<th>Phase</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follicular Phase</td>
<td>3.0 - 8.1 IU/L</td>
</tr>
<tr>
<td>Mid-Cycle Peak</td>
<td>2.6 - 16.7 IU/L</td>
</tr>
<tr>
<td>Luteal Phase</td>
<td>1.4 - 5.5 IU/L</td>
</tr>
<tr>
<td>Post-menopausal</td>
<td>26.7 - 133.4 IU/L</td>
</tr>
</tbody>
</table>

Reference range adopted from Abbott (vendor) based on in-house verification study of 23 male (18 years old) normal volunteers in the UCSF Laboratory and 20 split female sample comparisons with ARUP.

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 26% lower than the Centaur method. Please note that the reference ranges have changed.
This assay standardization is traceable to the World Health Organization (WHO) FSH 1st International Standard, (92/510).

Medi-Cal Medical Necessity Policy applies.

ADMINISTRATIVE

CPT Codes:
83001
LOINC Codes:
15067-2

COMPLETE VIEW

Available Stat:
No
Ordering Recommendations:
This assay is suitable for use in adult patients to assess general endocrine function. Samples from younger patients are referred to a reference laboratory employing a more sensitive assay (see entry for FSH, Ultrasensitive).

Test Code:
FSH
Test Group:
Performing Lab:
China Basin Chemistry

Performed:
Thursday, Sunday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
Gold or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Units:
IU/L

Reference Interval:
Adult males (>= 18 years): 1.0 - 12.0 IU/L

Adult females (>= 18 years):

<table>
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<th>Follicular Phase</th>
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</tr>
<tr>
<td>Post-menopausal</td>
<td>28.7 -133.4 IU/L</td>
</tr>
</tbody>
</table>

Reference range adopted from Abbott (vendor) based on in-house verification study of 23 male (18 years old) normal volunteers in the UCSF Laboratory and 20 split female sample comparisons with ARUP.

Synonyms:
- FSH
- follitropin
- gonadotropin tests

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

Reported:
1-3 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 26% lower than the Centaur method. Please note that the reference ranges have changed.

This assay standardization is traceable to the World Health Organization (WHO) FSH 1st International Standard, (92/510).

Medi-Cal Medical Necessity Policy applies.

CPT Codes:
83001

LOINC Codes:
15067-2
# Follicle Stimulating Hormone, Pediatric

**PFSH**

## ORDERING

**Approval Required:**
Yes, contact Chemistry at x3-1501 if ordered in patients over the age of 20.

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Imunoassay

**Reported:**
Test performed Tuesday and Friday. Turnaround time: 2-6 days.

**Additional Information:**
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Follicle stimulating hormone" (test code FSH). It requires approval if ordered in patients over the age of 20.

Medi-Cal Medical Necessity Policy applies.

FSH peaks (typically 3.00-6.00 mIU/mL for this assay) in male infants at 4 months of age, falling to prepubertal levels by 1 year of age.

FSH peaks (as high as 30.00 mIU/mL for this assay) in female infants at 3 months of age, falling slowly to prepubertal levels by 1-2 years of age.

(Forest MG, Ducharme JR, Gonadotropic and gonadal hormones, Ch 8, in: Bertrand et al, eds. Pediatric Endocrinology, 2ND Ed. Baltimore: Williams &Wilkins, 1993).

**Synonyms:**
- FSH ultrasensitive
- FSH Pediatric

## COLLECTION

**Sample Type:**
Serum

**Collect:**
Red top or gold top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.3 mL serum

## PROCESSING

**Test Code:**
PFSH

**Test Group:**
FSH

**Sendout:**
Yes

**Performing Lab:**
Quest
Specimen Preparation:
Freeze at -20°C. Specify age and sex on request form. Order Quest #36087.

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

RESULT INTERPRETATION

Units:
mlU/mL

Reference Interval:

Males
0-4 years  Not established
5-9 years  0.21-4.33 mlU/mL
10-13 years 0.53-4.92 mlU/mL
14-17 years 0.84-8.74 mlU/mL

Females
0-4 years  Not established
5-9 years  0.72-5.33 mlU/mL
10-13 years 0.87-9.16 mlU/mL
14-17 years 0.64-10.98 mlU/mL

*See Additional Information

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Follicle stimulating hormone" (test code FSH). It requires approval if ordered in patients over the age of 20.

Medi-Cal Medical Necessity Policy applies.

FSH peaks (typically 3.00-6.00 mlU/mL for this assay) in male infants at 4 months of age, falling to prepubertal levels by 1 year of age.

FSH peaks (as high as 30.00 mlU/mL for this assay) in female infants at 3 months of age, falling slowly to prepubertal levels by 1-2 years of age.

(Forest MG, Ducharme JR, Gonadotropic and gonadal hormones, Ch 8, in: Bertrand et al, eds. Pediatric Endocrinology, 2ND Ed. Baltimore: Williams & Wilkins, 1993).

ADMINISTRATIVE

CPT Codes:
83001-90

LOINC Codes:
15067-2

COMPLETE VIEW

Approval Required:
Yes, contact Chemistry at x3-1501 if ordered in patients over the age of 20.

Available Stat:
No

Test Code:
PFSH

Test Group:
FSH

Performing Lab:
Sendout: Yes

Methodology: Immunoassay

Collect: Red top or gold top

Amount to Collect: 1 mL blood

Sample Type: Serum

Preferred Volume: 0.5 mL serum

Minimum Volume: 0.3 mL serum

Specimen Preparation:
- Freeze at -20C. Specify age and sex on request form. Order Quest #36087.

Units: mIU/mL

Reference Interval:

Males
- 0-4 years: Not established
- 5-9 years: 0.21-4.33 mIU/mL
- 10-13 years: 0.53-4.92 mIU/mL
- 14-17 years: 0.84-8.74 mIU/mL

Females
- 0-4 years: Not established
- 5-9 years: 0.72-5.33 mIU/mL
- 10-13 years: 0.87-9.16 mIU/mL
- 14-17 years: 0.64-10.98 mIU/mL

*See Additional Information

Synonyms:
- FSH ultrasensitive
- FSH Pediatric

Reported:
- Test performed Tuesday and Friday. Turnaround time: 2-6 days.

Additional Information:
- This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Follicle stimulating hormone" (test code FSH). It requires approval if ordered in patients over the age of 20.
- Medi-Cal Medical Necessity Policy applies.
- FSH peaks (typically 3.00-6.00 mIU/mL for this assay) in male infants at 4 months of age, falling to prepubertal levels by 1 year of age.
- FSH peaks (as high as 30.00 mIU/mL for this assay) in female infants at 3 months of age, falling slowly to prepubertal levels by 1-2 years of age.

(Forest MG, Ducharme JR, Gonadotropic and gonadal hormones, Ch 8, in: Bertrand et al, eds. Pediatric Endocrinology, 2ND Ed. Baltimore: Williams & Wilkins, 1993).

CPT Codes:
- 83001-90

LOINC Codes:
- 15067-2
Fondaparinux
FONDA

ORDERING

Available Stat: No
Performing Lab: Parnassus Hematology
Performed: Monday - Friday 0800-1600
Methodology: Chromogenic anti-factor Xa
 Reported: 1-3 days for routine requests

Additional Information:

Although the manufacturer DOES NOT provide recommendations for a therapeutic range, the manufacturer provides the following information regarding observed drug levels in individuals treated with fondaparinux (Prescribing information from Glaxo Smithkline, 2008). Values in these ranges may be expected when fondaparinux is measured.

Prophylactic dose: 2.5 mg, once daily.
Peak steady-state plasma concentration: 0.39-0.50 micrograms/mL (3 hours post-dose)
Minimum steady-state plasma concentration: 0.14-0.19 micrograms/mL.

Therapeutic dose: 5 mg (body weight <50 kg), 7.5 mg (body weight 50-100 kg) or 10 mg (body weight >100 kg) once daily.
Peak steady-state plasma concentration: 1.20-1.26 micrograms/mL (3 hours post dose)
Minimum steady-state plasma concentration: 0.46-0.62 micrograms/mL.

The manufacturer recommends that if during therapy with fondaparinux, unexpected changes in coagulation parameters or major bleeding occurs, fondaparinux should be discontinued.

Recommendations for fondaparinux therapy and monitoring are available through the UCSF Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

Synonyms:
- Arixtra
- Monitoring Anticoagulation
- Anti Factor 10a
- Anti Factor Xa

COLLECTION

Sample Type: Plasma
Collect: Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL
Preferred Volume: 1 mL
Minimum Volume: 0.5 mL
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to
wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Stability (from collection to initiation):**

Room temperature 4 hours

**Unacceptable Conditions:**

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.

### PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>FONDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Parnassus Hematology</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Deliver immediately to Hematology for processing.</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL</td>
</tr>
</tbody>
</table>

**Unacceptable Conditions:**

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.

**Stability (from collection to initiation):**

Room temperature 4 hours

### RESULT INTERPRETATION

**Units:**

µg/mL

**Reference Interval:**

See additional information

**Critical Values:**

> 1.26 µg/mL

**Additional Information:**

Although the manufacturer DOES NOT provide recommendations for a therapeutic range, the manufacturer provides the following information regarding observed drug levels in individuals treated with fondaparinux (Prescribing information from Glaxo Smithkline, 2008). Values in these ranges may be expected when fondaparinux is measured.

**Prophylactic dose:** 2.5 mg, once daily.
Peak steady-state plasma concentration: 0.39-0.50 micrograms/mL (3 hours post-dose)
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**Therapeutic dose:** 5 mg (body weight <50 kg), 7.5 mg (body weight 50-100 kg) or 10 mg (body weight >100 kg) once daily.
Peak steady-state plasma concentration: 1.20-1.26 micrograms/mL (3 hours post dose)
Minimum steady-state plasma concentration: 0.46-0.62 micrograms/mL

The manufacturer recommends that if during therapy with fondaparinux, unexpected changes in coagulation parameters or major bleeding occurs, fondaparinux should be discontinued.

Recommendations for fondaparinux therapy and monitoring are available through the UCSF Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

### ADMINISTRATIVE
CPT Codes: 80299
LDT or Modified FDA: Yes
LOINC Codes: 49060-7

**COMPLETE VIEW**

Available Stat: No
Test Code: FONDA
Performing Lab: Parnassus Hematology
Performed: Monday - Friday 0800-1600
Methodology: Chromogenic anti-factor Xa
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL
Sample Type: Plasma
Preferred Volume:
1 mL
Minimum Volume:
0.5 mL
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected.
Specimen Preparation:
Deliver immediately to Hematology for processing.
Units:
µg/mL
Reference Interval:
See additional information
Critical Values:
> 1.26 µg/mL
Synonyms:
- Arixtra
- Monitoring Anticoagulation
- Anti Factor 10a
- Anti Factor Xa
Stability (from collection to initiation):
Room temperature 4 hours
Reported:
1-3 days for routine requests
Additional Information:

Although the manufacturer DOES NOT provide recommendations for a therapeutic range, the manufacturer provides the following information regarding observed drug levels in individuals treated with fondaparinux (Prescribing information from Glaxo Smithkline, 2008). Values in these ranges may be expected when fondaparinux is measured.

Prophylactic dose: 2.5 mg, once daily.
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Peak steady-state plasma concentration: 1.20-1.26 micrograms/mL (3 hours post dose)
Minimum steady-state plasma concentration: 0.46-0.62 micrograms/mL.

The manufacturer recommends that if during therapy with fondaparinux, unexpected changes in coagulation parameters or major bleeding occurs, fondaparinux should be discontinued.

Recommendations for fondaparinux therapy and monitoring are available through the UCSF Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

CPT Codes:
80299

LDT or Modified FDA:
Yes

LOINC Codes:
49060-7
Fragile X FRX

ORDERING

Ordering Recommendations:
Used in the assessment of patients with mental retardation, adult onset tremor/ataxia in men and/or premature ovarian failure in women.

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 2x per week, Wednesday & Friday, day shift only

Methodology:
Southern blot for methylation analysis.
PCR and capillary electrophoresis for number of CGG repeats

Reported:
10-14 days

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Males:
Presence of a full mutation with complete methylation is associated with mental retardation. Methylation mosaicism and/or premutation along with a full mutation has been shown to reduce the severity of mental retardation.

Females:
A premutation in a female is not associated with mental retardation. The presence of a full mutation in a female carries approximately 30% risk of mild mental retardation.

The chance that a premutation could expand to a full mutation when passed from a female carrier to her offspring is shown in the following table:

<table>
<thead>
<tr>
<th>Premutation CGG repeats</th>
<th>Risk of Expansion to Full Mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-59</td>
<td>4%</td>
</tr>
<tr>
<td>60-69</td>
<td>5%</td>
</tr>
<tr>
<td>70-79</td>
<td>31%</td>
</tr>
<tr>
<td>80-89</td>
<td>58%</td>
</tr>
<tr>
<td>90-99</td>
<td>80%</td>
</tr>
<tr>
<td>&gt;99</td>
<td>approx 100%</td>
</tr>
</tbody>
</table>

Adult onset disease:
Fragile X-associated tremor / ataxia syndrome (FXTAS). An FMR-1 premutation may confer an adult risk for tremor and ataxia. Not all men with an FMR-1 premutation will develop FXTAS. The risk of developing FXTAS is age dependent and ranges from 17% (age 50-59), 38% (age 60-69), 45% (age 70-79) and 75% (age >= 80). However, it is estimated that only 20-30% of men with an FMR-1 premutation will develop the syndrome.

FMR-1 related premature ovarian failure (POF): Women with an FMR-1 premutation have an approximately 21% risk of developing POF as opposed to 1% in the general population.

If a mutation is detected it is recommended that the patient seek genetic counseling.
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Mental retardation
- ataxia
- ovarian failure
- FRAXA
- FMR-1

COLLECTION

Sample Type:
- EDTA whole blood, Amniocyte culture

Collect:
- Lavender top preferred, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:
- 3 mL blood

Preferred Volume:
- 3 mL blood

Minimum Volume:
- 2 mL blood

Remarks:
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Unacceptable Conditions:
- Inadequate sample. Samples collected in heparin.

PROCESSING

Test Code:
- FRX

Performing Lab:
- Medical Genomics - Molecular Diagnostics

Specimen Preparation:
- Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
- 3 mL blood

Minimum Volume:
- 2 mL blood

Unacceptable Conditions:
- Inadequate sample. Samples collected in heparin.

RESULT INTERPRETATION

Reference Interval:

Results are reported as "No Mutation Detected", "Pre-mutation Present" or "Full Mutation Present".

Number of CGG repeats is also reported.

Result                  CGG Repeats
Normal  <45
Intermediate  45-54
Premutation  55-200
Full mutation >200

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Males:
Presence of a full mutation with complete methylation is associated with mental retardation. Methylation mosaicism and/or premutation along with a full mutation has been shown to reduce the severity of mental retardation.

Females:
A premutation in a female is not associated with mental retardation. The presence of a full mutation in a female carries approximately 30% risk of mild mental retardation.

The chance that a premutation could expand to a full mutation when passed from a female carrier to her offspring is shown in the following table:

<table>
<thead>
<tr>
<th>Premutation CGG repeats</th>
<th>Risk of Expansion to Full Mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>55-59</td>
<td>4%</td>
</tr>
<tr>
<td>60-69</td>
<td>5%</td>
</tr>
<tr>
<td>70-79</td>
<td>31%</td>
</tr>
<tr>
<td>80-89</td>
<td>58%</td>
</tr>
<tr>
<td>90-99</td>
<td>80%</td>
</tr>
<tr>
<td>&gt;99</td>
<td>approx 100%</td>
</tr>
</tbody>
</table>

Adult onset disease:
Fragile X-associated tremor / ataxia syndrome (FXTAS). An FMR-1 premutation may confer an adult risk for tremor and ataxia. Not all men with an FMR-1 premutation will develop FXTAS. The risk of developing FXTAS is age dependent and ranges from 17% (age 50-59), 38% (age 60-69), 45% (age 70-79) and 75% (age >= 80). However, it is estimated that only 20-30% of men with an FMR-1 premutation will develop the syndrome.

FMR-1 related premature ovarian failure (POF): Women with an FMR-1 premutation have an approximately 21% risk of developing POF as opposed to 1% in the general population.

If a mutation is detected it is recommended that the patient seek genetic counseling.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
81243, 81244

LDT or Modified FDA:
Yes

LOINC Codes:
36913-2
Available Stat: No

Ordering Recommendations:
Used in the assessment of patients with mental retardation, adult onset tremor/ataxia in men and/or premature ovarian failure in women.

Test Code: FRX

Performing Lab: Medical Genomics - Molecular Diagnostics

Performed:
Run 2x per week, Wednesday & Friday, day shift only

Methodology:
Southern blot for methylation analysis.
PCR and capillary electrophoresis for number of CGG repeats

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top preferred, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood, Amniocyte culture

Preferred Volume:
3 mL blood

Minimum Volume:
2 mL blood

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval:

Results are reported as "No Mutation Detected", "Pre-mutation Present" or "Full Mutation Present". Number of CGG repeats is also reported.

<table>
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<tr>
<th>Result</th>
<th>CGG Repeats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;45</td>
</tr>
<tr>
<td>Intermediate</td>
<td>45-54</td>
</tr>
<tr>
<td>Premutation</td>
<td>55-200</td>
</tr>
<tr>
<td>Full mutation</td>
<td>&gt;200</td>
</tr>
</tbody>
</table>

Synonyms:
- Mental retardation
- ataxia
- ovarian failure
- FRAXA
- FMR-1

Reported:
10-14 days

**Additional Information:**

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**Males:**
Presence of a full mutation with complete methylation is associated with mental retardation. Methylation mosaicism and/or premutation along with a full mutation has been shown to reduce the severity of mental retardation.

**Females:**
A premutation in a female is not associated with mental retardation. The presence of a full mutation in a female carries approximately 30% risk of mild mental retardation.

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**Adult onset disease:**
Fragile X-associated tremor / ataxia syndrome (FXTAS). An FMR-1 premutation may confer an adult risk for tremor and ataxia. Not all men with an FMR-1 premutation will develop FXTAS. The risk of developing FXTAS is age dependent and ranges from 17% (age 50-59), 38% (age 60-69), 45% (age 70-79) and 75% (age >= 80). However, it is estimated that only 20-30% of men with an FMR-1 premutation will develop the syndrome.

FMR-1 related premature ovarian failure (POF): Women with an FMR-1 premutation have an approximately 21% risk of developing POF as opposed to 1% in the general population.

If a mutation is detected it is recommended that the patient seek genetic counseling.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
81243, 81244

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
36913-2
Free Catecholamines, Fractionated, plasma
CATEP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC w/ electrochemical detection
Reported:
Test run Monday-Friday. Turnaround time: 2-5 days.
Additional Information:
Generally recommended ONLY for tumor localization or for special evaluations such as clonidine suppression or glucagon stimulation.
To convert ng/L of Epinephrine or Norepinephrine to pmol/L (SI units) multiply by 5.45 or 5.91, respectively.
Due to the effects of stress, plasma levels are generally unreliable in infants and children, for whom urinary assays are recommended.
Synonyms:
- Adrenaline
- catechols
- dopamine
- noradrenaline
- norepinephrine
- epinephrine

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection. Patients should be relaxed in a supine (recommended) or upright position before blood is drawn. States of anxiety and stress can cause fluctuations in the catecholamine levels.
Sample Type:
Heparinized plasma
Collect:
Dark Green top (on ice) (Light green top acceptable)
Amount to Collect:
8 mL blood
Preferred Volume:
4 mL plasma
Minimum Volume:
2.5 mL plasma
Remarks:
Pre-chill tube. Bring all samples to the laboratory on wet ice immediately for separation and freezing of plasma within 15 minutes of collection. Indicate if patient was supine or upright during collection on the requisition.
Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 6 hours, frozen at -20C 1 month.
Unacceptable Conditions:
Not delivered on ice or delivered > 15 minutes after collection

PROCESSING
Test Code: CATP
Test Group: Catecholamines
Sendout: Yes
Performing Lab: Quest

Specimen Preparation:
Process immediately. Plasma should be separated in a refrigerated centrifuge within 30 minutes of collection and then frozen immediately at -20C in plastic vials. Plasma MUST be RBC free. Order Quest # 8193N. Enter supine or upright information into Misys

Preferred Volume:
4 mL plasma

Minimum Volume:
2.5 mL plasma

Unacceptable Conditions:
Not delivered on ice or delivered > 15 minutes after collection

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 6 hours, frozen at -20C 1 month.

RESULT INTERPRETATION

Units: pg/mL
Reference Interval:

Pediatric patient supine:
Children age 3-15 years:
Epinephrine <= 464 pg/mL
Norepinephrine <= 1251 pg/mL
Dopamine <60 pg/mL

>= 18 year olds patient supine:
Epinephrine <50 pg/mL
Norepinephrine 112-658 pg/mL
Dopamine <10 pg/mL
Total 123-671 pg/mL

>= 18 year old patient upright (not recommended):
Epinephrine <95 pg/mL
Norepinephrine 217-1109 pg/mL
Dopamine <20 pg/mL
Total 242-1125 pg/mL

Printed 06/07/19
Test information subject to change
Pediatric normals from: J Chromatogr 1993 617:304-307

Additional Information:
Generally recommended ONLY for tumor localization or for special evaluations such as clonidine suppression or glucagon stimulation.

To convert ng/L of Epinephrine or Norepinephrine to pmol/L (SI units) multiply by 5.45 or 5.91, respectively.

Due to the effects of stress, plasma levels are generally unreliable in infants and children, for whom urinary assays are recommended.

**ADMINISTRATIVE**

CPT Codes:
- 82384-90

LOINC Codes:
- 42493-7

**COMPLETE VIEW**

Available Stat:
No

Test Code:
CATP

Test Group:
Catecholamines

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC w/ electrochemical detection

Patient Preparation:
An 8 hour fast before specimen collection is preferred. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection. Patients should be relaxed in a supine (recommended) or upright position before blood is drawn. States of anxiety and stress can cause fluctuations in the catecholamine levels.

Remarks:
Pre-chill tube. Bring all samples to the laboratory on wet ice immediately for separation and freezing of plasma within 15 minutes of collection. Indicate if patient was supine or upright during collection on the requisition.

Collect:
Dark Green top (on ice) (Light green top acceptable)

Amount to Collect:
8 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
4 mL plasma

Minimum Volume:
2.5 mL plasma

Unacceptable Conditions:
Not delivered on ice or delivered > 15 minutes after collection

Specimen Preparation:
Process immediately. Plasma should be separated in a refrigerated centrifuge within 30 minutes of collection and then frozen immediately at -20C in plastic vials. Plasma MUST be RBC free. Order Quest # 8193N. Enter supine or upright information into Misys
pg/mL

Reference Interval:

Pediatric patient supine:
Children age 3-15 years:
- Epinephrine $\leq 464$ pg/mL
- Norepinephrine $\leq 1251$ pg/mL
- Dopamine $< 60$ pg/mL

$\geq 18$ year olds patient supine:
- Epinephrine $< 50$ pg/mL
- Norepinephrine 112-658 pg/mL
- Dopamine $< 10$ pg/mL
- Total 123-671 pg/mL

$\geq 18$ year old patient upright (not recommended):
- Epinephrine $< 95$ pg/mL
- Norepinephrine 217-1109 pg/mL
- Dopamine $< 20$ pg/mL
- Total 242-1125 pg/mL

Pediatric normals from: J Chromatogr 1993 617:304-307

Synonyms:
- Adrenaline
- catechols
- dopamine
- noradrenaline
- norepinephrine
- epinephrine

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 6 hours, frozen at -20°C 1 month.

Reported:
Test run Monday-Friday. Turnaround time: 2-5 days.

Additional Information:
Generally recommended ONLY for tumor localization or for special evaluations such as clonidine suppression or glucagon stimulation.

To convert ng/L of Epinephrine or Norepinephrine to pmol/L (SI units) multiply by 5.45 or 5.91, respectively.

Due to the effects of stress, plasma levels are generally unreliable in infants and children, for whom urinary assays are recommended.

CPT Codes:
82384-90
LOINC Codes:
42493-7
Free Hemoglobin, Plasma
PHGBS

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus Chemistry
Methodology:
HemoCue Plasma/Low Hb Photometer
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:

NOTE: This is a rapid test for plasma free hemoglobin with limited analytic sensitivity and low specificity. If a more sensitive and specific test for Plasma Free Hemoglobin is required, please order the sendout test for Plasma Free Hemoglobin (ARUP test code 0020058).

If extreme care is used to avoid hemolysis during phlebotomy and no interfering substances are present, values of <8 mg/dL are normally expected in this assay. Note that this Hemocue assay has been modified to screen for normal levels of Plasma Free Hemoglobin < 8 mg/dL. This rapid assay is susceptible to false positive increases in measured hemoglobin values owing to interfering substances including lipid particles. The sensitivity of the assay is also limited. Therefore, specific values for plasma hemoglobin are not reported including when the results appear to be above the normal cutoff. In cases where the screening results suggest the possibility of an elevated plasma hemoglobin level, the sample will be automatically sent out for independent testing at the ARUP reference laboratory to obtain a specific measurement of the plasma hemoglobin concentration.

For samples that can be reliably determined to contain a normal level of plasma hemoglobin, the results will reported as "< 8 mg/dL."

For samples that cannot be reliably determined to contain a normal level of plasma hemoglobin, the results will be reported out one of two ways:

1. "Plasma free hemoglobin result may exceed normal cutoff, but does not appear to be above 50 mg/dL. False positive elevations due to interfering substances cannot be ruled out and the precise level of plasma free hemoglobin cannot be determined. Sample sent out for testing by an alternate method."
   OR
2. "The level of plasma free hemoglobin cannot be estimated because of possible assay interference. Sample sent out for testing by an alternate method."

This test is primarily intended to screen for hemolysis during extracorporeal membrane life support (ECLS) . In patients on ECLS, it is recommended that plasma hemoglobin levels > 50 mg/dL be investigated to determine whether it is being caused by a condition of the patient or by components of the ECLS circuit. See ELSO Guidelines for Cardiopulmonary Extracorporeal Life Support. Extracorporeal Life Support Organization, Version 1:1. April 2009, www.elso.med.umich.edu

To convert mg/dL to µmol/L (SI units) multiply by 0.155.

Synonyms:
- hemoglobin, free
- Free Hgb
- Free Hb

COLLECTION

Sample Type:
Heparinized plasma
Collect:
Light green top preferred, Dark green top acceptable
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma

Minimum Volume:

0.7 mL plasma

Remarks:

Results are highly dependent upon meticulous technique employed in collecting the specimen. To avoid hemolysis use an 18-19 ga. butterfly needle and discard the first 4 mL. Alternatively, apply a tourniquet and perform a venipuncture with an 18-19 ga. needle; collect any other tubes which are needed before releasing the tourniquet with the vacutainer still in the vein and collecting the sample for the hemoglobin assay. If no other samples are being collected at the same time, draw and discard one tube, release the tourniquet, then draw a second tube and submit the second tube for analysis.

PROCESSING

Test Code:

PHGBS

Performing Lab:

Parnassus Chemistry

Preferred Volume:

1 mL plasma

Minimum Volume:

0.7 mL plasma

RESULT INTERPRETATION

Units:

mg/dL

Reference Interval:

<8 mg/dL

Additional Information:

NOTE: This is a rapid test for plasma free hemoglobin with limited analytic sensitivity and low specificity. If a more sensitive and specific test for Plasma Free Hemoglobin is required, please order the sendout test for Plasma Free Hemoglobin (ARUP test code 0020058).

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2. "The level of plasma free hemoglobin cannot be estimated because of possible assay interference. Sample sent out for testing by an alternate method."

This test is primarily intended to screen for hemolysis during extracorporeal membrane life support (ECLS). In patients on ECLS, it is recommended that plasma hemoglobin levels > 50 mg/dL be investigated to determine whether it is being caused by a condition of the patient or by components of the ECLS circuit. See ELSO Guidelines for Cardiopulmonary Extracorporeal Life Support. Extracorporeal Life Support Organization, Version 1:1. April 2009, www.elso.med.umich.edu

To convert mg/dL to µmol/L (SI units) multiply by 0.155.
CPT Codes:
83051

LOINC Codes:
721-1

**COMPLETE VIEW**

Available Stat:
Yes

Test Code:
PHGBS

Performing Lab:
Parnassus Chemistry

Methodology:
HemoCue Plasma/Low Hb Photometer

Remarks:
Results are highly dependent upon meticulous technique employed in collecting the specimen. To avoid hemolysis use an 18-19 ga. butterfly needle and discard the first 4 mL. Alternatively, apply a tourniquet and perform a venipuncture with an 18-19 ga. needle; collect any other tubes which are needed before releasing the tourniquet with the vacutainer still in the vein and collecting the sample for the hemoglobin assay. If no other samples are being collected at the same time, draw and discard one tube, release the tourniquet, then draw a second tube and submit the second tube for analysis.

Collect:
Light green top preferred, Dark green top acceptable

Amount to Collect:
2 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.7 mL plasma

Units:
mg/dL

Reference Interval:
<8 mg/dL

Synonyms:
- hemoglobin, free
- Free Hgb
- Free Hb

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:

NOTE: This is a rapid test for plasma free hemoglobin with limited analytic sensitivity and low specificity. If a more sensitive and specific test for Plasma Free Hemoglobin is required, please order the sendout test for Plasma Free Hemoglobin (ARUP test code 0020058).

If extreme care is used to avoid hemolysis during phlebotomy and no interfering substances are present, values of <8 mg/dL are normally expected in this assay. Note that this HemoCue assay has been modified to screen for normal levels of Plasma Free Hemoglobin < 8 mg/dL. This rapid assay is susceptible to false positive increases in measured hemoglobin values owing to interfering substances including lipid particles. The sensitivity of the assay is also limited. Therefore, specific values for plasma hemoglobin are not reported including when the results appear to be above the normal cutoff. In cases where the screening results suggest the possibility of an elevated plasma hemoglobin level, the sample will be automatically sent out for independent testing at the ARUP reference laboratory to obtain a specific measurement of the plasma hemoglobin concentration.

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1. "Plasma free hemoglobin result may exceed normal cutoff, but does not appear to be above 50 mg/dL. False positive elevations due to interfering substances cannot be ruled out and the precise level of plasma free hemoglobin cannot be determined. Sample sent out for testing by an alternate method."

OR

2. "The level of plasma free hemoglobin cannot be estimated because of possible assay interference. Sample sent out for testing by an alternate method."

This test is primarily intended to screen for hemolysis during extracorporeal membrane life support (ECLS). In patients on ECLS, it is recommended that plasma hemoglobin levels > 50 mg/dL be investigated to determine whether it is being caused by a condition of the patient or by components of the ECLS circuit. See ELSO Guidelines for Cardiopulmonary Extracorporeal Life Support. Extracorporeal Life Support Organization, Version 1:1. April 2009, www.elso.med.umich.edu

To convert mg/dL to µmol/L (SI units) multiply by 0.155.

CPT Codes:

83051

LOINC Codes:

721-1
Free Kappa & Lambda light chains, urine
FRULC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Nephelometry
Reported:
Set up 5 days per week. Turn around 2-4 days
Additional Information:
Polyclonal Immunoglobulin light chains (kappa and Lambda) normally occur in a ratio of 2:1, whereas monoclonal immunoglobulin light chains exhibit only one light chain type, either kappa or lambda. A kappa:lambda ratio outside 2:1 is an indication of a monoclonal gammopathy.
Synonyms:
• K/L ratio

COLLECTION

Sample Type:
24 hour or random urine
Collect:
24 hour urine collection container or urine cup
Amount to Collect:
Complete 24 hour urine output or 10 mL random urine
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 3 weeks, frozen at -20C 3 months

PROCESSING

Test Code:
FRULC
Test Group:
light chains
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample. Order Quest test # 11233X.
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 3 weeks, frozen at -20C 3 months
Additional Information:
Polyclonal Immunoglobulin light chains (kappa and Lambda) normally occur in a ratio of 2:1, whereas monoclonal immunoglobulin light chains exhibit only one light chain type, either kappa or lambda. A kappa:lambda ratio outside 2:1 is an indication of a monoclonal gammopathy.

CPT Codes:
83883-90 x 2

LOINC Codes:
41759-2

Complete View
Available Stat:
No

Test Code:
FRULC

Test Group:
light chains

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Nephelometry

Collect:
24 hour urine collection container or urine cup

Amount to Collect:
Complete 24 hour urine output or 10 mL random urine

Sample Type:
24 hour or random urine

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Specimen Preparation:
Refrigerate sample. Order Quest test # 11233X.

Synonyms:
• K/L ratio

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 3 weeks, frozen at -20C 3 months

Reported:
Set up 5 days per week. Turn around 2-4 days

Additional Information:
Polyclonal Immunoglobulin light chains (kappa and Lambda) normally occur in a ratio of 2:1, whereas monoclonal immunoglobulin light chains exhibit only one light chain type, either kappa or lambda. A kappa:lambda ratio outside 2:1 is an indication of a monoclonal gammopathy.

CPT Codes:
83883-90 x 2

LOINC Codes:
41759-2
Free Sialic Acid, urine
MOLT

ORDERING
Available Stat: No
Performing Lab: JMC
Reported: Turnaround: 2-4 weeks.

COLLECTION
Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 5 mL urine
Remarks: A detailed clinical history must accompany the test request or be sent by fax to (215) 955-9554.

PROCESSING
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: Sialic acid
Sendout: Yes
Performing Lab: JMC
Specimen Preparation:
Ship by Federal Express at room temperature: Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 394, 1024 Locust St., Philadelphia, PA 19107, ph: (215) 955-4923, fax: 955-9554, david.wenger@mail.tju.edu
Preferred Volume: 5 mL urine

RESULT INTERPRETATION
Reference Interval: Negative

COMPLETE VIEW
Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Performing Lab: JMC
Sendout: Yes
Remarks: A detailed clinical history must accompany the test request or be sent by fax to (215) 955-9554.
Collect: Urine cup
Amount to Collect: See preferred volume
Sample Type: Random urine
Preferred Volume: 5 mL urine
Specimen Preparation: Ship by Federal Express at room temperature: Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 394, 1024 Locust St., Philadelphia, PA 19107, ph: (215) 955-4923, fax: 955-9554, david.wenger@mail.tju.edu
Reference Interval: Negative
Reported: Turnaround: 2-4 weeks.
Free T3, Adult
FT3

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday - Saturday (day shift)
Methodology:
Two step chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported:
0 to 2 days
Additional Information:
T3 circulates in the blood as an equilibrium mixture of free and protein bound hormone. T3 is bound to thyroxine binding globulin (TBG), prealbumin, and albumin. The binding of these proteins is such that only 0.2-0.4% of the total T3 is present in solution as unbound or free T3. This free fraction represents the physiologically active thyroid hormone. Occasionally, FT3 alone is elevated (T3 thyrotoxicosis) in about 5% of the hyperthyroid population. FT3 may also be important in monitoring patients on antithyroid therapy where treatment is focused on reducing the T3 production and the T4 conversion to T3. Serum FT3 may also be useful in assessing the severity of the thyrotoxic state.
Synonyms:
• Triiodothyronine

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma

PROCESSING

Test Code:
FT3
Test Group:
Thyroid tests
Performing Lab:
China Basin Chemistry
Specimen Preparation:
Refrigerate
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
- pmol/L

Reference Interval:
- Adults (18 years and older): 2.6-5.7 pmol/L
- For children, order test Free T3, Pediatric (code PFT3)

Adult reference ranges adopted from manufacturer reference range studies (95% CI) and verified in-house using blood donor (N=124) (excluding autologous donors) on no medications and negative for anti-Tg and TPO antibodies.

Additional Information:
- T3 circulates in the blood as an equilibrium mixture of free and protein bound hormone. T3 is bound to thyroxine binding globulin (TBG), prealbumin, and albumin. The binding of these proteins is such that only 0.2-0.4% of the total T3 is present in solution as unbound or free T3. This free fraction represents the physiologically active thyroid hormone. Occasionally, FT3 alone is elevated (T3 thyrotoxicosis) in about 5% of the hyperthyroid population. FT3 may also be important in monitoring patients on antithyroid therapy where treatment is focused on reducing the T3 production and the T4 conversion to T3. Serum FT3 may also be useful in assessing the severity of the thyrotoxic state.

Administrative

CPT Codes:
- 84481

LOINC Codes:
- 3051-0

Complete View

Available Stat:
- No

Test Code:
- FT3

Test Group:
- Thyroid tests

Performing Lab:
- China Basin Chemistry

Performed:
- Monday - Saturday (day shift)

Methodology:
- Two step chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
- Gold top or Light Green top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 1 mL serum or plasma

Minimum Volume:
- 0.5 mL serum or plasma

Specimen Preparation:
- Refrigerate

Units:
- pmol/L

Reference Interval:
- Adults (18 years and older): 2.6-5.7 pmol/L
- For children, order test Free T3, Pediatric (code PFT3)
Adult reference ranges adopted from manufacturer reference range studies (95% CI) and verified in-house using blood donor (N=124) (excluding autologous donors) on no medications and negative for anti-Tg and TPO antibodies.

**Synonyms:**
- Triiodothyronine

**Reported:**
- 0 to 2 days

**Additional Information:**
T3 circulates in the blood as an equilibrium mixture of free and protein bound hormone. T3 is bound to thyroxine binding globulin (TBG), prealbumin, and albumin. The binding of these proteins is such that only 0.2-0.4% of the total T3 is present in solution as unbound or free T3. This free fraction represents the physiologically active thyroid hormone. Occasionally, FT3 alone is elevated (T3 thyrotoxicosis) in about 5% of the hyperthyroid population. FT3 may also be important in monitoring patients on antithyroid therapy where treatment is focused on reducing the T3 production and the T4 conversion to T3. Serum FT3 may also be useful in assessing the severity of the thyrotoxic state.

**CPT Codes:**
- 84481

**LOINC Codes:**
- 3051-0

Test information subject to change
Free T3, Pediatric
PFT3

ORDERING

Approval Required:
Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

Available Stat:
No

Performing Lab:
Quest

Methodology:
ICMA

Reported:
4 days.

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see “Free T3, Adult” (test code FT3). It requires approval if ordered in patients over the age of 20.

Synonyms:
- Triiodothyronine

COLLECTION

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
PFT3

Test Group:
Thyroid tests

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Freeze serum. Order Quest test #34429X

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION
Units:
pg/dL

Reference Interval:
<1 year: Not Established
1-9 years: 337-506 pg/dL
10-13 years: 335-480 pg/dL
14-18 years: 287-455 pg/dL

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Free T3, Adult" (test code FT3). It requires approval if ordered in patients over the age of 20.

Administrative

CPT Codes:
84481-90

LOINC Codes:
3051-0

Complete View

Approval Required:
Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

Available Stat:
No

Test Code:
PFT3

Test Group:
Thyroid tests

Performing Lab:
Quest

Sendout:
Yes

Methodology:
ICMA

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze serum. Order Quest test #34429X

Units:
pg/dL

Reference Interval:
<1 year: Not Established
1-9 years: 337-506 pg/dL
10-13 years: 335-480 pg/dL
14-18 years: 287-455 pg/dL

Synonyms:
• Triiodothyronine

Reported:
4 days.

**Additional Information:**

This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Free T3, Adult" (test code FT3). It requires approval if ordered in patients over the age of 20.

**CPT Codes:**

84481-90

**LOINC Codes:**

3051-0
Free T4
FT4

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday - Saturday (day shift)
Methodology:
Two step chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported:
0 to 2 days
Synonyms:
- tetraiodothyronine
- free thyroxine

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.25 mL serum or plasma

PROCESSING

Test Code:
FT4
Test Group:
Thyroid tests
Performing Lab:
China Basin Chemistry
Specimen Preparation:
Refrigerate
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.25 mL serum or plasma

RESULT INTERPRETATION

Units:
pmol/L
Reference Interval:
Age Male (pmol/L) Female (pmol/L)
Pediatric reference ranges adopted from Pediatric Reference Intervals seventh edition (Soldin, Steven J. et al) and Canadian Laboratory Initiative on Reference Interval Database (CALIPER) Clin Biochem 2009;42:885-991

Adult 95% reference range from the manufacturer (personal communication, Abbott Labs) was verified by running 148 non-autologous donor samples from subjects on no medications and neg. for TgAb and TPO Ab

**ADMINISTRATIVE**

**CPT Codes:**
- 84439

**LOINC Codes:**
- 3024-7

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- FT4

**Test Group:**
- Thyroid tests

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Monday - Saturday (day shift)

**Methodology:**
- Two step chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

**Collect:**
- Gold top or Light Green top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Serum or plasma

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.25 mL serum or plasma

**Specimen Preparation:**
- Refrigerate

**Units:**
- pmol/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Group</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
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<tbody>
<tr>
<td>1-3 days</td>
<td>10-36</td>
<td>11-25</td>
</tr>
<tr>
<td>4-30 days</td>
<td>6-30</td>
<td>8-25</td>
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<tr>
<td>1-12 months</td>
<td>10-26</td>
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<td>1-5 years</td>
<td>11-21</td>
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<td>6-10 years</td>
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<td>11-19</td>
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<tr>
<td>&gt;10 years</td>
<td>10-18</td>
<td>10-18</td>
</tr>
<tr>
<td>Age</td>
<td>Male (pmol/L)</td>
<td>Female (pmol/L)</td>
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</tr>
<tr>
<td>1-3 days</td>
<td>10-36</td>
<td>11-25</td>
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<tr>
<td>4-30 days</td>
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</tr>
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<td>10-18</td>
<td>10-18</td>
</tr>
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Pediatric reference ranges adopted from Pediatric Reference Intervals seventh edition (Soldin, Steven J. et al) and Canadian Laboratory Initiative on Reference Interval Database (CALIPER) Clin Biochem 2009;42:885-991

Adult 95% reference range from the manufacturer (personal communication, Abbott Labs) was verified by running 148 non-autologous donor samples from subjects on no medications and neg. for TgAb and TPO Ab

**Synonyms:**
- tetraiodothyronine
- free thyroxine

**Reported:**
0 to 2 days

**CPT Codes:**
- 84439

**LOINC Codes:**
- 3024-7
Free T4 (by dialysis)
FT4D

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Equilibrium dialysis, RIA
Reported:
Test performed Monday-Saturday. Turnaround time: 2-4 days.
Additional Information:
Testing is only indicated if there is a descrepancy between the results for TSH and Free T4.
Synonyms:
- tetraiodothyronine
- thyroxine

COLLECTION

Sample Type:
Serum
Collect:
Red top preferred, Gold top acceptable
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks

PROCESSING

Test Code:
FT4D
Test Group:
Thyroid tests
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 35167
Preferred Volume:
2 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks
RESULT INTERPRETATION

Units: ng/dL

Reference Interval:

- Prematures, 25-30 weeks, first week of life: 0.5-3.3 ng/dL
- Prematures, 31-36 weeks, first week of life: 1.3-4.7 ng/dL
- Cord blood, > 37 weeks: 1.2-2.2 ng/dL
- Birth-4 days: 2.2-5.3 ng/dL
- 2 weeks-2 years: 0.8-2.0 ng/dL
- 3-20 years: 1.0-2.4 ng/dL
- 21-87 yr: 0.8-2.7 ng/dL

Pregnancy:

- First trimester: 0.9-2.0 ng/dL
- Second trimester: 0.8-1.5 ng/dL
- Third trimester: 0.8-1.7 ng/dL

Additional Information:

Testing is only indicated if there is a discrepancy between the results for TSH and Free T4.

ADMINISTRATIVE

CPT Codes:
84439-90

LOINC Codes:
6892-4

COMPLETE VIEW

Available Stat:
No

Test Code:
FT4D

Test Group:
Thyroid tests

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Equilibrium dialysis, RIA

Collect:
Red top preferred, Gold top acceptable

Amount to Collect:
4 mL blood
Sample Type:
  Serum
Preferred Volume:
  2 mL serum
Minimum Volume:
  0.2 mL serum
Specimen Preparation:
  Refrigerate. Order Quest # 35167
Units:
  ng/dL
Reference Interval:
  Prematures, 25-30 weeks, first week of life 0.5-3.3 ng/dL
  Prematures, 31-36 weeks, first week of life 1.3-4.7 ng/dL
  Cord blood, > 37 weeks 1.2-2.2 ng/dL
  Birth-4 days 2.2-5.3 ng/dL
  2 weeks-2 years 0.8-2.0 ng/dL
  3-20 years 1.0-2.4 ng/dL
  21-87 yr 0.8-2.7 ng/dL

Pregnancy:
  First trimester 0.9-2.0 ng/dL
  Second trimester 0.8-1.5 ng/dL
  Third trimester 0.8-1.7 ng/dL

Synonyms:
  • tetraiodothyronine
  • thryoxine

Stability (from collection to initiation):
  Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks
Reported:
  Test performed Monday-Saturday. Turnaround time: 2-4 days.
Additional Information:
  Testing is only indicated if there is a descrepancy between the results for TSH and Free T4.
CPT Codes:
  84439-90
LOINC Codes:
  6892-4
**Fructosamine**

**FRUT**

**ORDERING**

**Ordering Recommendations:**
Test should be ordered only on patients whose diabetic control cannot be monitored with Glycohemoglobin.

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Colorimetric

**Reported:**
Test run Monday-Saturday. Turnaround time: 2-4 days.

**Synonyms:**
- glycalbumin
- glycated albumin
- glycosylated albumin

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Gold top

**Amount to Collect:**
4 mL blood

**Preferred Volume:**
2 ml serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

**Unacceptable Conditions:**
Hemolysis, moderate or gross icterus

**Rejection Criteria:**
Hemolysis, moderate or gross icterus

**PROCESSING**

**Test Code:**
FRUT

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Refrigerate. Order Quest # 8340

**Preferred Volume:**
2 ml serum

**Minimum Volume:**
0.5 mL serum
Unacceptable Conditions:
- Hemolysis, moderate or gross icterus

Rejection Criteria:
- Hemolysis, moderate or gross icterus

Stability (from collection to initiation):
- Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
- µmol/L

Reference Interval:
- 190-270 µmol/L

ADMINISTRATIVE

CPT Codes:
- 82985-90

LOINC Codes:
- 15069-8

COMPLETE VIEW

Available Stat:
- No

Ordering Recommendations:
- Test should be ordered only on patients whose diabetic control cannot be monitored with Glycohemoglobin.

Test Code:
- FRUT

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Colorimetric

Collect:
- Gold top

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum

Preferred Volume:
- 2 mL serum

Minimum Volume:
- 0.5 mL serum

Rejection Criteria:
- Hemolysis, moderate or gross icterus

Unacceptable Conditions:
- Hemolysis, moderate or gross icterus

Specimen Preparation:
- Refrigerate. Order Quest # 8340

Units:
- µmol/L

Reference Interval:
190-270 µmol/L

**Synonyms:**
- glycalbumin
- glycated albumin
- glycosylated albumin

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

**Reported:**
- Test run Monday-Saturday. Turnaround time: 2-4 days.

**CPT Codes:**
- 82985-90

**LOINC Codes:**
- 15069-8
FTA-ABS

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Indirect Fluorescence Assay
Reported: Test performed Monday-Friday, turnaround time: 1-4 days

Additional Information:
The VDRL test is the only serological assay which is approved for use in CSF. In patients suspected of neurosyphilis but with a non-reactive VDRL result, the FTA-ABS test may be useful in some cases. The FTA-ABS test has high sensitivity but is nonspecific with a high rate of false positive results in CSF.

References:

Synonyms:
- Fluorescent Treponemal Antibody Adsorption

COLLECTION

Sample Type: CSF
Collect: CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume: 1 mL CSF
Minimum Volume: 0.3 mL CSF

PROCESSING

Test Code: FTAC
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Refrigerate. Order test Quest test # 17088X
Preferred Volume: 1 mL CSF
Minimum Volume: 0.3 mL CSF

RESULT INTERPRETATION
Reference Interval:
Nonreactive

Additional Information:
The VDRL test is the only serological assay which is approved for use in CSF. In patients suspected of neurosyphilis but with a non-reactive VDRL result, the FTA-ABS test may be useful in some cases. The FTA-ABS test has high sensitivity but is nonspecific with a high rate of false positive results in CSF.

References:

CPT Codes:
86592-90

LOINC Codes:
9826-9

Available Stat:
No

Test Code:
FTAC

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Indirect Fluorescence Assay

Collect:
CSF tube or sterile collection tube

Amount to Collect:
See preferred volume

Sample Type:
CSF

Preferred Volume:
1 mL CSF

Minimum Volume:
0.3 mL CSF

Specimen Preparation:
Refrigerate. Order test Quest test # 17088X

Reference Interval:
Nonreactive

Synonyms:
- Fluorescent Treponemal Antibody Adsorption

Reported:
Test performed Monday-Friday, turnaround time: 1-4 days

Additional Information:
The VDRL test is the only serological assay which is approved for use in CSF. In patients suspected of neurosyphilis but with a non-reactive VDRL result, the FTA-ABS test may be useful in some cases. The FTA-ABS test has high sensitivity but is nonspecific with a high rate of false positive results in CSF.

References:
Fungal Culture, Blood
P258

ORDERING

Ordering Recommendations:

Fungal blood cultures are indicated only for Histoplasma capsulatum, however, bone marrow is the preferred specimen for this organism.

Yeasts such as candida grow well in routine blood cultures and a specific ‘fungal culture’ order is unnecessary for detecting yeasts.

Aspergillus and other molds will not grow in blood cultures; a tissue specimen is required for these organisms.

Approval Required:
Yes, consult Microbiology at x3-1268 for fungal blood culture requests.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Reported:
Up to 4 weeks

Additional Information:
Routine blood cultures are incubated for 5 days, sufficient to detect yeast.

Synonyms:
• H. capsulatum
• Histoplasma capsulatum

COLLECTION

Sample Type:
Heparinized blood

Collect:
Dark green top x 2 (DO NOT use Lithium heparin i.e. Light Green top tube.)

Amount to Collect:
8 mL blood

Preferred Volume:
8 mL blood

Minimum Volume:
4 mL blood

Stability (from collection to initiation):
Refrigerated 24 hours

Unacceptable Conditions:
Blood submitted in Lithium heparin (Lt. Green top) vacutainer.

PROCESSING

Test Code:
P258

Test Group:
Fungal Culture

Performing Lab:
Microbiology

Preferred Volume:
8 mL blood

Minimum Volume:
4 mL blood

Unacceptable Conditions:
Blood submitted in Lithium heparin (Lt. Green top) vacutainer.

Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Critical Values:
Biphasic fungus (e.g. Coccidiodes immitis) or zygomycetes (e.g. mucormycosis) isolated.

Additional Information:
Routine blood cultures are incubated for 5 days, sufficient to detect yeast.

ADMINISTRATIVE

CPT Codes:
87103

LOINC Codes:
572-8

COMPLETE VIEW

Approval Required:
Yes, consult Microbiology at x3-1268 for fungal blood culture requests.

Available Stat:
No

Ordering Recommendations:
Fungal blood cultures are indicated only for Histoplasma capsulatum, however, bone marrow is the preferred specimen for this organism.

Yeasts such as candida grow well in routine blood cultures and a specific ‘fungal culture’ order is unnecessary for detecting yeasts.

Aspergillus and other molds will not grow in blood cultures; a tissue specimen is required for these organisms.

Test Code:
P258

Test Group:
Fungal Culture

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Collect:
Dark green top x 2 (DO NOT use Lithium heparin i.e. Light Green top tube.)

Amount to Collect:
8 mL blood

Sample Type:
Heparinized blood

Preferred Volume:
8 mL blood
Minimum Volume:
4 mL blood

Unacceptable Conditions:
Blood submitted in Lithium heparin (Lt. Green top) vacutainer.

Critical Values:
Biphasic fungus (e.g. Coccidioides immitis) or zygomycetes (e.g. mucromycosis) isolated.

Synonyms:
- H. capsulatum
- Histoplasma capsulatum

Stability (from collection to initiation):
Refrigerated 24 hours

Reported:
Up to 4 weeks

Additional Information:
Routine blood cultures are incubated for 5 days, sufficient to detect yeast.

CPT Codes:
87103

LOINC Codes:
572-8
Fungal Culture, dermatophytes with KOH
P257

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Set up daily, day and evening shifts
Additional Information: Includes culture for dermatophytes and KOH-Calcofluor white stain. See also Mycology section in text at front of Lab Manual.

COLLECTION

Sample Type: Skin
Collect: Sterile container or Red top vacutainer
Stability (from collection to initiation): Refrigerated 24 hours
Unacceptable Conditions: Samples on swabs

PROCESSING

Test Code: P257
Test Group: Fungal Culture
Performing Lab: Microbiology
Unacceptable Conditions: Samples on swabs
Stability (from collection to initiation): Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information: Includes culture for dermatophytes and KOH-Calcofluor white stain. See also Mycology section in text at front of Lab Manual.

ADMINISTRATIVE

CPT Codes: 87101, 87206
LOINC Codes: 575-1

COMPLETE VIEW

Available Stat:
Test Code: P257
Test Group: Fungal Culture
Performing Lab: Microbiology
Performed: Set up daily, day and evening shifts
Collect: Sterile container or Red top vacuutainer
Sample Type: Skin
Unacceptable Conditions: Samples on swabs
Stability (from collection to initiation): Refrigerated 24 hours
Additional Information: Includes culture for dermatophytes and KOH-Calcofluor white stain. See also Mycology section in text at front of Lab Manual.
CPT Codes: 87101, 87206
LOINC Codes: 575-1
Fungal Culture, other fungi
P256

ORDERING

Approval Required:
Approval required for urine and joint fluid.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Methodology:
Culture

Reported:
Up to 30 days

Additional Information:
Includes KOH-Calcofluor White Stain, except on urine and bone marrow.

For diagnosis of yeast and Cryptococcal meningitis, recommended tests are: CSF bacterial culture (yeast, including Cryptococcus neoformans grow well on routine bacterial culture) CSF and serum Cryptococcal Antigen (CrAg).

The yield of CSF cultures for other dimorphic fungi and invasive molds, including Aspergillus, Blastomyces, Histoplasma and the Zygomycetes (Mucor and Rhizopus) is extremely low. Tissue biopsy, if possible, is the recommended specimen for fungal diagnosis by culture.

Synonyms:
- H. capsulatum
- Histoplasma capsulatum

COLLECTION

Sample Type:
Unfixed tissue, BAL, Sputum, Body fluid, Urine, Bone marrow

Collect:
Body fluid, Tissue, BAL: Sterile container
Sputum: Clean container (urine cup)
Bone marrow: Isolator tube (available from Hematology laboratory)

Amount to Collect:
See Preferred Volume

Preferred Volume:
BAL: 10-20 mL
Tissue: 5 mm3
Urine: 10-20 mL
Body fluid: 5-10 mL
Sputum: > 1 mL
Bone marrow: 1 mL

Minimum Volume:
Tissue: 1-2 cu mm
BAL, Urine, Body fluid: 2 mL
Sputum: 1 mL
Bone marrow: 0.5 mL

Remarks:
Swab specimens are not acceptable as they have very low fungal yields.

Stability (from collection to initiation):
Refrigerated 24 hours
Unacceptable Conditions:
Samples on swabs, stool samples

PROCESSING

Test Code:
P256
Test Group: Fungal Culture
Performing Lab: Microbiology

Preferred Volume:
- BAL: 10-20 mL
- Tissue: 5 mm3
- Urine: 10-20 mL
- Body fluid: 5-10 mL
- Sputum: > 1 mL
- Bone marrow: 1 mL

Minimum Volume:
- Tissue: 1-2 cu mm
- BAL, Urine, Body fluid: 2 mL
- Sputum: 1 mL
- Bone marrow: 0.5 mL

Unacceptable Conditions:
Samples on swabs, stool samples

Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Reference Interval:
No fungus isolated

Critical Values:
KOH if C. immitis spherules present or non-septate hyphae suggestive of Zygomycetes; Biphasic fungus (e.g. Coccidiodes immitis) isolated. Zygomycete (e.g. mucormycosis) isolated. Positive cultures from CSF. Positive culture from a sample submitted for sterility testing.

Additional Information:
Includes KOH-Calcofluor White Stain, except on urine and bone marrow.

For diagnosis of yeast and Cryptococcal meningitis, recommended tests are: CSF bacterial culture (yeast, including Cryptococcus neoformans grow well on routine bacterial culture) CSF and serum Cryptococcal Antigen (CrAg).

The yield of CSF cultures for other dimorphic fungi and invasive molds, including Aspergillus, Blastomyces, Histoplasma and the Zygomycetes (Mucor and Rhizopus) is extremely low. Tissue biopsy, if possible, is the recommended specimen for fungal diagnosis by culture.

ADMINISTRATIVE

CPT Codes:
- Fungal culture 87102
- KOH (If performed) 87206

LOINC Codes:
580-1

COMPLETE VIEW

Approval Required:
Approval required for urine and joint fluid.

Available Stat:
No

Test Code:
P256

Test Group:
Fungal Culture

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Methodology:
Culture

Remarks:
Swab specimens are not acceptable as they have very low fungal yields.

Collect:
Body fluid, Tissue, BAL: Sterile container
Sputum: Clean container (urine cup)
Bone marrow: Isolator tube (available from Hematology laboratory)

Amount to Collect:
See Preferred Volume

Sample Type:
Unfixed tissue, BAL, Sputum, Body fluid, Urine, Bone marrow

Preferred Volume:
BAL: 10-20 mL
Tissue: 5 mm3
Urine: 10-20 mL
Body fluid: 5-10 mL
Sputum: > 1 mL
Bone marrow: 1 mL

Minimum Volume:
Tissue: 1-2 cu mm
BAL, Urine, Body fluid: 2 mL
Sputum: 1 mL
Bone marrow: 0.5 mL

Unacceptable Conditions:
Samples on swabs, stool samples

Reference Interval:
No fungus isolated

Critical Values:
KOH if C. immitis spherules present or non-septate hyphae suggestive of Zygomycetes; Biphasic fungus (e.g. Coccidiodes immitis) isolated. Zygomycete (e.g. mucormycosis) isolated. Positive cultures from CSF. Positive culture from a sample submitted for sterility testing

Synonyms:
H. capsulatum
Histoplasma capsulatum

Stability (from collection to initiation):
Refrigerated 24 hours

Reported:
Up to 30 days

Additional Information:
Includes KOH-Calcofluor White Stain, except on urine and bone marrow.

For diagnosis of yeast and Cryptococcal meningitis, recommended tests are: CSF bacterial culture (yeast, including Cryptococcus neoformans grow well on routine bacterial culture) CSF and serum Cryptococcal Antigen (CrAg).

The yield of CSF cultures for other dimorphic fungi and invasive molds, including Aspergillus, Blastomyces, Histoplasma and the
Zygomycetes (Mucor and Rhizopus) is extremely low. Tissue biopsy, if possible, is the recommended specimen for fungal diagnosis by culture.

**CPT Codes:**
- Fungal culture 87102
- KOH (If performed) 87206

**LOINC Codes:**
- 580-1
Fungal Culture, yeast
P259Y

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Set up daily
Additional Information: This test is indicated when Candida species are the only fungi of concern. Separate fungal culture of blood or urine for yeast is unnecessary, as Candida will be detected by the routine bacterial culture if ordered. For vaginal yeast infections order Vaginal smear for Bacterial vaginosis/Yeast.
Synonyms: Fungal culture

COLLECTION

Sample Type: Vaginal fluid, Wound, Oral
Collect: Swab in Amies transport medium with charcoal
Stability (from collection to initiation): Refrigerated 24 hours

PROCESSING

Test Code: P259Y
Test Group: Fungal Culture
Performing Lab: Microbiology
Stability (from collection to initiation): Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information: This test is indicated when Candida species are the only fungi of concern. Separate fungal culture of blood or urine for yeast is unnecessary, as Candida will be detected by the routine bacterial culture if ordered. For vaginal yeast infections order Vaginal smear for Bacterial vaginosis/Yeast.

ADMINISTRATIVE

CPT Codes: 87102
LOINC Codes: 18482-0

COMPLETE VIEW
Available Stat: No

Test Code: P259Y

Test Group: Fungal Culture

Performing Lab: Microbiology

Performed: Set up daily

Collect: Swab in Amies transport medium with charcoal

Sample Type: Vaginal fluid, Wound, Oral

Synonyms: Fungal culture

Stability (from collection to initiation): Refrigerated 24 hours

Additional Information: This test is indicated when Candida species are the only fungi of concern. Separate fungal culture of blood or urine for yeast is unnecessary, as Candida will be detected by the routine bacterial culture if ordered. For vaginal yeast infections order Vaginal smear for Bacterial vaginosis/Yeast.

CPT Codes: 87102

LOINC Codes: 18482-0
GAD-65 Autoantibodies
GAD

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Radio Binding
Reported:
Test performed Wednesday and Friday. Turnaround 3-6 days
Synonyms:
- Glutamic acid decarboxylase
- GAD 65 AB
- anti-GAD65 antibody
- GADA

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
GAD
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze sample. Quest test # 139261P
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Units:
U/mL
Reference Interval:
\( \leq 1.0 \text{ U/mL} \)
ADMINISTRATIVE

CPT Codes:
83519-90

LOINC Codes:
13926-1

COMPLETE VIEW

Available Stat:
No

Test Code:
GAD

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Radio Binding

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Freeze sample. Quest test # 139261P

Units:
U/mL

Reference Interval:
<= 1.0 U/mL

Synonyms:
- Glutamic acid decarboxylase
- GAD 65 AB
- anti-GAD65 antibody
- GADA

Reported:
Test performed Wednesday and Friday. Turnaround 3-6 days

CPT Codes:
83519-90

LOINC Codes:
13926-1
Galactomannan Antigen
GMAN

ORDERING

Approval Required:
None required for Serum or BAL samples. CSF samples require approval, call x31268
Available Stat:
No
Performing Lab:
Viracor
Methodology:
EIA
Reported:
Set up 6x per week. Turnaround 3-5 days

Additional Information:
This assay detects a cell wall antigen of Aspergillus species and other fungi. It may be helpful in identifying patients with disseminated Aspergillosis. Sensitivity 67-100%, Specificity 81-99%. However, given low incidence of disseminated aspergillosis, the positive predictive value is low unless the pre-test probability is relatively high. Should be limited to febrile, neutropenic patients with pulmonary infiltrates in whom no other cause for fever can be found.

Synonyms:
- Aspergillus Ag

COLLECTION

Sample Type:
Serum, Bronchalveolar lavage (BAL)
CSF by approval only, call x31268
Sputum samples are not acceptable.

Collect:
Blood: Gold top (Must be separate tube)
BAL: Capped Plastic tube
CSF: CSF tube or sterile collection tube (By approval only)

Amount to Collect:
Blood: 3 mL
BAL: 3 mL
CSF: 2 mL

Preferred Volume:
Serum: 1 mL
BAL: 3 mL
CSF: 2 mL

Minimum Volume:
Serum: 0.5 mL
BAL: 1 mL
CSF: 2 mL

Remarks:
To avoid environmental contamination cap tube immediately after collection and do not re-open. Bring samples to lab for processing asap

Unacceptable Conditions:
Sputum received

PROCESSING

Test Code:
GMAN
Sendout:
Performing Lab:
Viracor

Specimen Preparation:
- **Serum**: Do not open primary tube. Centrifuge sample within 2 hours of collection to pellet cells under gel and freeze entire tube at -20°C until shipped. Sample is shipped frozen
- **BAL**: Do not open collection container except in Biosafety cabinet. Freeze sample at -20°C upon receipt. Sample is shipped frozen

Order Viracor test #1600

Preferred Volume:
- Serum: 1 mL
- BAL: 3 mL
- CSF: 2 mL

Minimum Volume:
- Serum: 0.5 mL
- BAL: 1 mL
- CSF: 2 mL

Unacceptable Conditions:
- Sputum received

RESULT INTERPRETATION

Units:
- Index

Reference Interval:
- Negative: < 0.5 Index
- Positive: >= 0.5 Index

Additional Information:
This assay detects a cell wall antigen of Aspergillus species and other fungi. It may be helpful in identifying patients with disseminated Aspergillosis. Sensitivity 67-100%, Specificity 81-99%. However, given low incidence of disseminated aspergillosis, the positive predictive value is low unless the pre-test probability is relatively high. Should be limited to febrile, neutropenic patients with pulmonary infiltrates in whom no other cause for fever can be found.

ADMINISTRATIVE

CPT Codes:
- 87305-90

LOINC Codes:
- 35383-9

COMPLETE VIEW

Approval Required:
- None required for Serum or BAL samples. CSF samples require approval, call x31268

Available Stat:
- No

Test Code:
- GMAN

Performing Lab:
- Viracor

Sendout:
- Yes

Methodology:
- EIA

Remarks:
- To avoid environmental contamination cap tube immediately after collection and do not re-open. Bring samples to lab for processing
asap

Collect:
- Blood: Gold top (Must be separate tube)
- BAL: Capped Plastic tube
- CSF: CSF tube or sterile collection tube (By approval only)

Amount to Collect:
- Blood: 3 mL
- BAL: 3 mL
- CSF: 2 mL

Sample Type:
- Serum, Bronchialveolar lavage (BAL)
- CSF by approval only, call x31268
- Sputum samples are not acceptable.

Preferred Volume:
- Serum: 1 mL
- BAL: 3 mL
- CSF: 2 mL

Minimum Volume:
- Serum: 0.5 mL
- BAL: 1 mL
- CSF: 2 mL

Unacceptable Conditions:
- Sputum received

Specimen Preparation:
- Serum: Do not open primary tube. Centrifuge sample within 2 hours of collection to pellet cells under gel and freeze entire tube at -20C until shipped. Sample is shipped frozen
- BAL: Do not open collection container except in Biosafety cabinet. Freeze sample at -20C upon receipt. Sample is shipped frozen

Order Viracor test #1600

Units:
- Index

Reference Interval:
- Negative: < 0.5 Index
- Positive: >= 0.5 Index

Synonyms:
- Aspergillus Ag

Reported:
- Set up 6x per week. Turnaround 3-5 days

Additional Information:
- This assay detects a cell wall antigen of Aspergillus species and other fungi. It may be helpful in identifying patients with disseminated Aspergillosis. Sensitivity 67-100%, Specificity 81-99%. However, given low incidence of disseminated aspergillosis, the positive predictive value is low unless the pre-test probability is relatively high. Should be limited to febrile, neutropenic patients with pulmonary infiltrates in whom no other cause for fever can be found.

CPT Codes:
- 87305-90

LOINC Codes:
- 35383-9
**Galactose**

**GALAC**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Mayo

**Methodology:**
Spectrophotometric, kinetic

**Reported:**
8-15 days

**Additional Information:**
Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result.

Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

### COLLECTION

**Sample Type:**
Heparinized plasma

**Collect:**
Dark Green top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL plasma

**Minimum Volume:**
0.2 mL plasma

**Stability (from collection to initiation):**
Room temperature 20 days, refrigerated 20 days, frozen 1 year

### PROCESSING

**Test Code:**
GALAC

**Sendout:**
Yes

**Performing Lab:**
Mayo

**Specimen Preparation:**
Aliquot plasma and freeze. Transport to CB frozen. Order Mayo test code GALP.

**Preferred Volume:**
0.5 mL plasma

**Minimum Volume:**
0.2 mL plasma
Stability (from collection to initiation):

Room temperature 20 days, refrigerated 20 days, frozen 1 year

RESULT INTERPRETATION

Units:

mg/dL

Reference Interval:

1-7 days: < 5.4 mg/dL
8-14 days: < 3.6 mg/dL
>14 days: < 2.0 mg/dL

Additional Information:

Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridylyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result.

Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

ADMINISTRATIVE

CPT Codes:

82760-90

LOINC Codes:

25426-8

COMPLETE VIEW

Available Stat:

No

Test Code:

GALAC

Performing Lab:

Mayo

Sendout:

Yes

Methodology:

Spectrophotometric, kinetic

Collect:

Dark Green top

Amount to Collect:

1 mL blood

Sample Type:

Heparinized plasma

Preferred Volume:

0.5 mL plasma

Minimum Volume:

0.2 mL plasma

Specimen Preparation:

Aliquot plasma and freeze. Transport to CB frozen. Order Mayo test code GALP.

Units:
mg/dL

Reference Interval:
- 1-7 days: < 5.4 mg/dL
- 8-14 days: < 3.6 mg/dL
- >14 days: < 2.0 mg/dL

Stability (from collection to initiation):
- Room temperature 20 days, refrigerated 20 days, frozen 1 year

Reported:
- 8-15 days

Additional Information:
Galactosemia is an autosomal recessive disorder that results from a deficiency of one of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridylyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result.

Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

CPT Codes:
- 82760-90

LOINC Codes:
- 25426-8
Galactose-1-Phosphate Uridyl Transferase, RBC
G1PUT

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Ultraviolet, kinetic
Reported:
4-8 days
Additional Information:

Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis.

Duarte-variant galactosemia (compound heterozygosity for the Duarte mutation, N314D, and a classic mutation) is generally associated with higher levels of enzyme activity (5%-20%) than classic galactosemia (<5%); however, this may be indistinguishable by newborn screening assays. Typically, individuals with Duarte-variant galactosemia have a milder phenotype, but are also often treated with a low galactose diet during infancy. The LA variant, which consists of N314D and a second mutation, L218L, is associated with higher levels of GALT enzyme activity than the Duarte-variant allele.

Newborn screening, which identifies potentially affected individuals by measuring total galactose (galactose and Gal-1-P) and/or determining the activity of the GALT enzyme, varies from state to state. The diagnosis of galactosemia is established by follow-up quantitative measurement of GALT enzyme activity. If enzyme levels are indicative of carrier or affected status, molecular testing for common GALT mutations may be performed. If 1 or both disease-causing mutations are not detected by targeted mutation analysis and biochemical testing has confirmed the diagnosis of galactosemia, sequencing of the GALT gene is available to identify private mutations.

The GALT gene maps to 9p13. Several disease-causing mutations are common in patients with classic galactosemia (G/G genotype). The most frequently observed is the Q188R classic mutation. This mutation accounts for 60% to 70% of classical galactosemia alleles. The S135L mutation is the most frequently observed mutation in African Americans and accounts for approximately 50% of the mutant alleles in this population. The K285N mutation is common in those of eastern European descent and accounts for 25% to 40% of the alleles in this population. The L195P mutation is observed in 5% to 7% of classical galactosemia. The Duarte mutation (N314D) is observed in 5% of the general US population.

Synonyms:
- Phosphogalactose transferase
- Gal-1-P uridyl transferase

COLLECTION

Patient Preparation:
The patient should not be transfused prior to obtaining samples. If transfused sampling should be delayed for at least 1 month to make sure the transfused cells have predominantly cleared and we are only testing the patient's own cells.

Sample Type:
EDTA whole blood
Collect:
   Lavender top

Amount to Collect:
   5 mL blood

Preferred Volume:
   5 mL blood

Minimum Volume:
   2 mL blood

Remarks:
   Maintain sample at room temperature.

Stability (from collection to initiation):
   Room temperature 2 weeks, refrigerated 4 weeks

PROCESSING

Test Code:
   G1PUT

Sendout:
   Yes

Performing Lab:
   Mayo

Specimen Preparation:
   Transport sample refrigerated to CB. Order Mayo test code GALT.

Preferred Volume:
   5 mL blood

Minimum Volume:
   2 mL blood

Stability (from collection to initiation):
   Room temperature 2 weeks, refrigerated 4 weeks

RESULT INTERPRETATION

Units:
   U/g Hgb

Reference Interval:
   >18.4 U/g Hgb

Additional Information:

Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridylyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis.

Duarte-variant galactosemia (compound heterozygosity for the Duarte mutation, N314D, and a classic mutation) is generally associated with higher levels of enzyme activity (5%-20%) than classic galactosemia (<5%); however, this may be indistinguishable by newborn screening assays. Typically, individuals with Duarte-variant galactosemia have a milder phenotype, but are also often treated with a low galactose diet during infancy. The LA variant, which consists of N314D and a second mutation, L218L, is associated with higher levels of GALT enzyme activity than the Duarte-variant allele.
Newborn screening, which identifies potentially affected individuals by measuring total galactose (galactose and Gal-1-P) and/or determining the activity of the GALT enzyme, varies from state to state. The diagnosis of galactosemia is established by follow-up quantitative measurement of GALT enzyme activity. If enzyme levels are indicative of carrier or affected status, molecular testing for common GALT mutations may be performed. If 1 or both disease-causing mutations are not detected by targeted mutation analysis and biochemical testing has confirmed the diagnosis of galactosemia, sequencing of the GALT gene is available to identify private mutations.

The GALT gene maps to 9p13. Several disease-causing mutations are common in patients with classic galactosemia (G/G genotype). The most frequently observed is the Q188R classic mutation. This mutation accounts for 60% to 70% of classical galactosemia alleles. The S135L mutation is the most frequently observed mutation in African Americans and accounts for approximately 50% of the mutant alleles in this population. The K285N mutation is common in those of eastern European descent and accounts for 25% to 40% of the alleles in this population. The L195P mutation is observed in 5% to 7% of classical galactosemia. The Duarte mutation (N314D) is observed in 5% of the general US population.

CPT Codes:
82275-90

LOINC Codes:
2314-3

Available Stat:
No

Test Code:
G1PUT

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Ultraviolet, kinetic

Patient Preparation:
The patient should not be transfused prior to obtaining samples. If transfused sampling should be delayed for at least 1 month to make sure the transfused cells have predominantly cleared and we are only testing the patient's own cells.

Remarks:
Maintain sample at room temperature.

Collect:
Lavender top

Amount to Collect:
5 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
5 mL blood

Minimum Volume:
2 mL blood

Specimen Preparation:
Transport sample refrigerated to CB. Order Mayo test code GALT.

Units:
U/g Hgb

Reference Interval:
>18.4 U/g Hgb

Synonyms:
- Phosphogalactose transferase
Gal-1-P uridyl transferase

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks

Reported:
4-8 days

Additional Information:
Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis.

Duarte-variant galactosemia (compound heterozygosity for the Duarte mutation, N314D, and a classic mutation) is generally associated with higher levels of enzyme activity (5%-20%) than classic galactosemia (<5%); however, this may be indistinguishable by newborn screening assays. Typically, individuals with Duarte-variant galactosemia have a milder phenotype, but are also often treated with a low galactose diet during infancy. The LA variant, which consists of N314D and a second mutation, L218L, is associated with higher levels of GALT enzyme activity than the Duarte-variant allele.

Newborn screening, which identifies potentially affected individuals by measuring total galactose (galactose and Gal-1-P) and/or determining the activity of the GALT enzyme, varies from state to state. The diagnosis of galactosemia is established by follow-up quantitative measurement of GALT enzyme activity. If enzyme levels are indicative of carrier or affected status, molecular testing for common GALT mutations may be performed. If 1 or both disease-causing mutations are not detected by targeted mutation analysis and biochemical testing has confirmed the diagnosis of galactosemia, sequencing of the GALT gene is available to identify private mutations.

The GALT gene maps to 9p13. Several disease-causing mutations are common in patients with classic galactosemia (G/G genotype). The most frequently observed is the Q188R classic mutation. This mutation accounts for 60% to 70% of classical galactosemia alleles. The S135L mutation is the most frequently observed mutation in African Americans and accounts for approximately 50% of the mutant alleles in this population. The K285N mutation is common in those of eastern European descent and accounts for 25% to 40% of the alleles in this population. The L195P mutation is observed in 5% to 7% of classical galactosemia. The Duarte mutation (N314D) is observed in 5% of the general US population.

CPT Codes:
82275-90

LOINC Codes:
2314-3
Galactose-1-Phosphate, RBC
GLT1P

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Ultraviolet, enzymatic
Reported:
8-15 days

Additional Information:
Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with and effectiveness of dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis. The concentration of Gal-1-P in erythrocytes is the most sensitive index of dietary control.

Synonyms:
• Gal-1-P

COLLECTION

Patient Preparation:
The patient should not be transfused prior to obtaining samples. If transfused sampling should be delayed for at least 1 month to make sure the transfused cells have predominantly cleared and we are only testing the patient's own cells.

Sample Type:
Heparinized whole blood
Collect:
Dark Green top
Amount to Collect:
2 mL blood
Preferred Volume:
2 mL blood
Minimum Volume:
2 mL blood
Remarks:
Samples should only be collected Monday-Friday on the day shift, before noon. If received after 12:00 noon we can not guarantee the sample will be processed.

Do not collect these samples on weekends, holidays, or evenings.

Stability (from collection to initiation):
Washed and frozen RBC's 9 days.

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code:

GLT1P

Sendout:

Yes

Performing Lab:

Mayo

Specimen Preparation:

Erythrocytes must be washed within 4 hours of draw. If a sample is received after 12:00 noon refer it to Blood Bank staff to see if it can be processed the same day. If not the sample will need to be rejected.

Blood Bank will process sample as follows:
1. Centrifuge for 10 minutes at 650 x G.
2. Discard the plasma and buffy coat layers.
3. Add a cold 0.9% saline solution to the erythrocytes (about 2 times the volume of erythrocytes).
4. Mix gently by inversion and centrifuge again for 10 minutes at 650 x G.
5. Remove and discard the saline.
6. Repeat the wash steps (steps c-e) 2 more times.
7. After the final centrifugation, remove and discard the saline and a thin layer of the top cells.

Freeze sample after processing. Transport to CB frozen. Order Mayo test code GAL1P

Preferred Volume:

2 mL blood

Minimum Volume:

2 mL blood

Stability (from collection to initiation):

Washed and frozen RBC's 9 days.

RESULT INTERPRETATION

Units:

µg/g Hgb

Reference Interval:

Non-galactosemic: 5-49 mcg/g of hemoglobin (<1 mg/dL)
Galactosemic on galactose restricted diet: 80-125 mcg/g of hemoglobin (1-4 mg/dL)
Galactosemic on unrestricted diet: >125 mcg/g of hemoglobin (>4 mg/dL)

Additional Information:

Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridylyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with and effectiveness of dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis. The concentration of Gal-1-P in erythrocytes is the most sensitive index of dietary control.

ADMINISTRATIVE

CPT Codes:

84378-90

LOINC Codes:

38485-9
Available Stat: No
Test Code: GLT1P
Performing Lab: Mayo
Sendout: Yes
Methodology:
Ultraviolet, enzymatic
Patient Preparation:
The patient should not be transfused prior to obtaining samples. If transfused sampling should be delayed for at least 1 month to make sure the transfused cells have predominantly cleared and we are only testing the patient's own cells.
Remarks:
Samples should only be collected Monday-Friday on the day shift, before noon. If received after 12:00 noon we cannot guarantee the sample will be processed.

Do not collect these samples on weekends, holidays, or evenings.
Collect:
Dark Green top
Amount to Collect:
2 mL blood
Sample Type:
Heparinized whole blood
Preferred Volume:
2 mL blood
Minimum Volume:
2 mL blood
Specimen Preparation:
Erythrocytes must be washed within 4 hours of draw. If a sample is received after 12:00 noon refer it to Blood Bank staff to see if it can be processed the same day. If not the sample will need to be rejected.

Blood Bank will process sample as follows:
1. Centrifuge for 10 minutes at 650 x G.
2. Discard the plasma and buffy coat layers.
3. Add a cold 0.9% saline solution to the erythrocytes (about 2 times the volume of erythrocytes).
4. Mix gently by inversion and centrifuge again for 10 minutes at 650 x G.
5. Remove and discard the saline.
6. Repeat the wash steps (steps c-e) 2 more times.
7. After the final centrifugation, remove and discard the saline and a thin layer of the top cells.

Freeze sample after processing. Transport to CB frozen. Order Mayo test code GAL1P
Units:
µg/g Hgb
Reference Interval:
Non-galactosemic: 5-49 mcg/g of hemoglobin (<1 mg/dL)
Galactosemic on galactose restricted diet: 80-125 mcg/g of hemoglobin (1-4 mg/dL)
Galactosemic on unrestricted diet: >125 mcg/g of hemoglobin (>4 mg/dL)
Synonyms:
- Gal-1-P
Stability (from collection to initiation):
Washed and frozen RBC's 9 days.
Reported:
8-15 days
Additional Information:

Galactosemia is an autosomal recessive disorder that results from a deficiency of 1 of the 3 enzymes catalyzing the conversion of galactose to glucose: galactose-1-phosphate uridylyltransferase (GALT), galactokinase (GALK), and uridine diphosphate galactose-4-epimerase (GALE). GALT deficiency is the most common cause of galactosemia and is often referred to as classic galactosemia. The complete or near-complete deficiency of GALT enzyme is life-threatening if left untreated. Complications in the neonatal period include failure to thrive, liver failure, sepsis, and death; even with survival, long-term intellectual disability can result. Galactosemia is treated by a galactose-restricted diet, which allows for rapid recovery from the acute symptoms and a generally good prognosis. Despite adequate treatment from an early age, individuals with galactosemia remain at increased risk for developmental delays, speech problems, and abnormalities of motor function. Females with galactosemia are at increased risk for premature ovarian failure. Based upon reports by newborn screening programs, the frequency of classic galactosemia in the United States is approximately 1 in 30,000, although literature reports range from 1 in 10,000 to 1 in 60,000 live births.

Galactose-1-phosphate (Gal-1-P) accumulates in the erythrocytes of patients with galactosemia. The quantitative measurement of Gal-1-P is useful for monitoring compliance with and effectiveness of dietary therapy. Gal-1-P is thought to be the causative factor for development of liver disease in these patients and, because of this, patients should maintain low levels and be monitored on a regular basis. The concentration of Gal-1-P in erythrocytes is the most sensitive index of dietary control.

CPT Codes:

84378-90

LOINC Codes:

38485-9
Gamma-Glutamyl Transpeptidase, Plasma / Serum
GGT

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Kinetic enzymatic (glutamyl carboxynitroanilide)
Reported:
4 hours
Additional Information:
Hemolysis may artifactually lower the result.
Synonyms:
• GGT

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

PROCESSING

Test Code:
GGT
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
U/L
Reference Interval:
<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 7 days</td>
<td>25-168 U/L</td>
<td>18-148 U/L</td>
</tr>
<tr>
<td>8 days - 30 days</td>
<td>23-174 U/L</td>
<td>16-140 U/L</td>
</tr>
<tr>
<td>1 month - 3 months</td>
<td>16-147 U/L</td>
<td>16-140 U/L</td>
</tr>
<tr>
<td>4 months - 6 months</td>
<td>5-93 U/L</td>
<td>13-123 U/L</td>
</tr>
<tr>
<td>7 months - 1 year</td>
<td>8-38 U/L</td>
<td>8-59 U/L</td>
</tr>
<tr>
<td>1 year - 4 years</td>
<td>2-15 U/L</td>
<td>2-15 U/L</td>
</tr>
<tr>
<td>5 years - 9 years</td>
<td>6-16 U/L</td>
<td>6-19 U/L</td>
</tr>
<tr>
<td>10 years - 17 years</td>
<td>7-26 U/L</td>
<td>8-23 U/L</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>10-69 U/L</td>
<td>7-37 U/L</td>
</tr>
</tbody>
</table>

2. Normal range for children 5 to less than 18 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Additional Information:
Hemolysis may artifactualy lower the result.
7 months - 1 year  8-38 U/L  8-59 U/L
1 year - 4 years   2-15 U/L  2-15 U/L
5 years - 9 years  6-16 U/L  6-19 U/L
10 years - 17 years 7-26 U/L  8-23 U/L
>= 18 years       10-69 U/L  7-37 U/L

2. Normal range for children 5 to less than 18 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

**Synonyms:**
- GGT

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**
- 4 hours

**Additional Information:**
- Hemolysis may artfactually lower the result.

**CPT Codes:**
- 82977

**LOINC Codes:**
- 2324-2
Gastric Acidity, Titratable
GAA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Titration
Reported:
Test run Tuesday and Friday. Turnaround time: 2-6 days.
Additional Information:
This test is little used today, primarily to determine whether or not an elevated gastrin level is due to achlorhydria or to monitor the adequacy of medical therapy of a gastrinoma. In the basal state the volume and acid production in each interval should be about the same. Peak acid output is computed from the output in the two highest consecutive 15 minute intervals multiplied by 2. The acid output titratable to pH 7.0 is reported for each sample. Total acid output in each sample may be calculated by multiplying the total acidity (in mmol/L) x total sample volume (in liters).
Synonyms:
- Titratable acidity

COLLECTION

Patient Preparation:
Procedure must be scheduled in advance with the GI motility lab, 400 Parnassus, room A6102, x39383. Contact the GI motility lab regarding instructions for ordering, patient preparation, etc.
Sample Type:
Gastric fluid
Collect:
Clean container or urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
10 mL for each sample
Minimum Volume:
6 mL each sample
Remarks:
Record the volume of each sample and submit an aliquot of 10 mL (min. 6 mL) to the laboratory for titration. If the volume of a specimen is less than 6 mL, the specimen can be pooled with the specimen from the next collection interval. Do NOT pool pre- and post-stimulation specimens.

PROCESSING

Test Code:
GAA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate and submit each entire sample. Order Quest # 10945X for each sample.
Preferred Volume:
10 mL for each sample
Minimum Volume:
6 mL each sample

RESULT INTERPRETATION

Units:
mEq/L
Reference Interval:
  Free HCl output: 0.0-40.0 mEq/L
  Total (titratable) acidity: 10.0-60.0 mEq/L

Basal acid output (BAO) is normally < 5 mmol/h and peak output 5-40 mmol/h.
Additional Information:
This test is little used today, primarily to determine whether or not an elevated gastrin level is due to achlorhydria or to monitor the adequacy of medical therapy of a gastrinoma. In the basal state the volume and acid production in each interval should be about the same. Peak acid output is computed from the output in the two highest consecutive 15 minute intervals multiplied by 2.
The acid output titratable to pH 7.0 is reported for each sample. Total acid output in each sample may be calculated by multiplying the total acidity (in mmol/L) x total sample volume (in liters).

ADMINISTRATIVE

CPT Codes:
82930-90
LOINC Codes:
14583-9

COMPLETE VIEW

Available Stat:
No
Test Code:
GAA
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Titration
Patient Preparation:
Procedure must be scheduled in advance with the GI motility lab, 400 Parnassus, room A6102, x39383. Contact the GI motility lab regarding instructions for ordering, patient preparation, etc.
Remarks:
Record the volume of each sample and submit an aliquot of 10 mL (min. 6 mL) to the laboratory for titration. If the volume of a specimen is less than 6 mL, the specimen can be pooled with the specimen from the next collection interval. Do NOT pool pre- and post-stimulation specimens.
Collect:
Clean container or urine cup
Amount to Collect:
See preferred volume
Sample Type:
Gastric fluid
Preferred Volume:
10 mL for each sample
Minimum Volume:
6 mL each sample
**Specimen Preparation:**
Refrigerate and submit each entire sample. Order Quest # 10945X for each sample.

**Units:**
mEq/L

**Reference Interval:**
- Free HCl output: 0.0-40.0 mEq/L
- Total (titratable) acidity: 10.0-60.0 mEq/L

Basal acid output (BAO) is normally < 5 mmol/h and peak output 5-40 mmol/h.

**Synonyms:**
- Titratable acidity

**Reported:**
Test run Tuesday and Friday. Turnaround time: 2-6 days.

**Additional Information:**
This test is little used today, primarily to determine whether or not an elevated gastrin level is due to achlorhydria or to monitor the adequacy of medical therapy of a gastrinoma. In the basal state the volume and acid production in each interval should be about the same. Peak acid output is computed from the output in the two highest consecutive 15 minute intervals multiplied by 2.

The acid output titratable to pH 7.0 is reported for each sample. Total acid output in each sample may be calculated by multiplying the total acidity (in mmol/L) x total sample volume (in liters).

**CPT Codes:**
82930-90

**LOINC Codes:**
14583-9
Gastric Parietal Cell Antibody
GPCA

ORDERING

Available Stat:
No

Performing Lab:
Quest

Methodology:
ELISA

Additional Information:

Pernicious anemia is a chronic disease and is the end stage of type A (autoimmune) chronic atrophic gastritis. The type A chronic atrophic gastritis affects the fundus and body of the stomach, while type B (nonimmune, associated with H. pylori infection) affects the antrum as well as the secretory canaliculi and the tubulovesicles of the gastric parietal cells. This antigen has been identified as the gastric H+/K+ ATPase (gastric proton pump). GPA bind to both the alpha and beta subunits of the H+/K+ ATPase.

GPA prevalence increases with age and has been reported in 2.5% of a normal population 30-39 years old and in 9.6% of a population in their 8th decade.

Synonyms:
• anti-parietal cell antibody
• parietal cell antibodies

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

PROCESSING

Test Code:
GPCA

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Freeze sample. Order Quest #15114X

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

RESULT INTERPRETATION

Units:
Reference Interval:
- **Negative**: \( \leq 20.0 \) Units
- **Equivocal**: 20.1-24.9 Units
- **Positive**: \( \geq 25.0 \) Units

Additional Information:
Pernicious anemia is a chronic disease and is the end stage of type A (autoimmune) chronic atrophic gastritis. The type A chronic atrophic gastritis affects the fundus and body of the stomach, while type B (nonimmune, associated with H. pylori infection) affects the antrum as well as the secretory canaliculi and the tubulovesicles of the gastric parietal cells. This antigen has been identified as the gastric H+/K+ ATPase (gastric proton pump). GPA bind to both the alpha and beta subunits of the H+/K+ ATPase.

GPA prevalence increases with age and has been reported in 2.5% of a normal population 30-39 years old and in 9.6% of a population in their 8th decade.

**CPT Codes:**
- 83516-90

**LOINC Codes:**
- 56147-2

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- GPA

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- ELISA

Collect:
- Red top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.3 mL serum

Specimen Preparation:
- Freeze sample. Order Quest #15114X

Units:
- Units

Reference Interval:
- **Negative**: \( \leq 20.0 \) Units
- **Equivocal**: 20.1-24.9 Units
- **Positive**: \( \geq 25.0 \) Units

Synonyms:
- anti-parietal cell antibody
- parietal cell antibodies

Additional Information:
Pernicious anemia is a chronic disease and is the end stage of type A (autoimmune) chronic atrophic gastritis. The type A chronic
atrophic gastritis affects the fundus and body of the stomach, while type B (nonimmune, associated with H. pylori infection) affects the antrum as well as the secretory canaliculi and the tubulovesicles of the gastric parietal cells. This antigen has been identified as the gastric H+/K+ ATPase (gastric proton pump). GPA bind to both the alpha and beta subunits of the H+/K+ ATPase.

GPA prevalence increases with age and has been reported in 2.5% of a normal population 30-39 years old and in 9.6% of a population in their 8th decade.

CPT Codes:
83516-90

LOINC Codes:
56147-2
**Gastrin**

**ORDERING**

Available Stat:  
No

**Performing Lab:**  
Quest

**Methodology:**  
Chemiluminescence

**Reported:**  
Test performed 3 days a week. Turnaround time: 6-7 days.

**Synonyms:**  
- Secretin stimulation test

**COLLECTION**

**Patient Preparation:**  
Overnight fasting is required, preferably >= 12 hours.

**Sample Type:**  
Serum

**Collect:**  
Red top, or Gold top (on ice)

**Amount to Collect:**  
2 mL blood

**Preferred Volume:**  
1 mL serum

**Minimum Volume:**  
0.5 mL serum

**Remarks:**  
Chill tube on ice prior to collection. Bring to lab on ice immediately after collection.

**Stability (from collection to initiation):**  
Refrigerated 5 hours, frozen at -20°C 1 month.

**Unacceptable Conditions:**  
Not delivered on ice. Sample hemolyzed or lipemic.

**Rejection Criteria:**  
Received thawed.

**PROCESSING**

**Test Code:**  
GAST

**Sendout:**  
Yes

**Performing Lab:**  
Quest

**Specimen Preparation:**  
Process immediately. Freeze at -20°C. Order Quest # 478X.

**Preferred Volume:**  
1 mL serum

**Minimum Volume:**  
0.5 mL serum
Unacceptable Conditions:
   Not delivered on ice. Sample hemolyzed or lipemic.

Rejection Criteria:
   Received thawed.

Stability (from collection to initiation):
   Refrigerated 5 hours, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
   pg/mL

Reference Interval:
   <5 years: Not established
   5-17 years: 13-64 pg/mL
   >= 18 year old: <= 100 pg/mL

   Note: reference ranges apply to fasting samples only.

ADMINISTRATIVE

CPT Codes:
   82941-90

LOINC Codes:
   2333-3

COMPLETE VIEW

Available Stat:
   No

Test Code:
   GAST

Performing Lab:
   Quest

Sendout:
   Yes

Methodology:
   Chemiluminescence

Patient Preparation:
   Overnight fasting is required, preferably >= 12 hours.

Remarks:
   Chill tube on ice prior to collection. Bring to lab on ice immediately after collection.

Collect:
   Red top, or Gold top (on ice)

Amount to Collect:
   2 mL blood

Sample Type:
   Serum

Preferred Volume:
   1 mL serum

Minimum Volume:
   0.5 mL serum

Rejection Criteria:
   Received thawed.

Unacceptable Conditions:
   Not delivered on ice. Sample hemolyzed or lipemic.
Specimen Preparation:
   Process immediately. Freeze at -20°C. Order Quest # 478X.

Units:
   pg/mL

Reference Interval:
   <5 years: Not established
   5-17 years: 13-64 pg/mL
   >= 18 year old: <= 100 pg/mL

   Note: reference ranges apply to fasting samples only.

Synonyms:
   • Secretin stimulation test

Stability (from collection to initiation):
   Refrigerated 5 hours, frozen at -20C 1 month.

Reported:
   Test performed 3 days a week. Turnaround time: 6-7 days.

CPT Codes:
   82941-90

LOINC Codes:
   2333-3
GD1A Antibody, IgG
GD1AG

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Enzyme Immunoassay

**Reported:**
- 5-7 days

**Additional Information:**
Ganglioside GD1a antibody IgG is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

**Synonyms:**
- Ganglioside GD1a antibody
- Guillain-Barre

**COLLECTION**

**Patient Preparation:**
- Overnight fasting preferred but not required

**Sample Type:**
- Serum

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 1 week, frozen 1 month

**PROCESSING**

**Test Code:**
- GD1AG

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 38916

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 1 week, frozen 1 month
RESULT INTERPRETATION

Units:
Titer
Reference Interval:
<1:100
Additional Information:
Ganglioside GD1a antibody IgG is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

ADMINISTRATIVE

CPT Codes:
83520-90
LOINC Codes:
21283-7

COMPLETE VIEW

Available Stat:
No
Test Code:
GD1AG
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzyme Immunoassay
Patient Preparation:
Overnight fasting preferred but not required
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 38916
Units:
Titer
Reference Interval:
<1:100
Synonyms:
- Ganglioside GD1a antibody
- Guillain-Barre
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month
Reported:
5-7 days

Additional Information:
Ganglioside GD1a antibody IgG is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

CPT Codes:
83520-90

LOINC Codes:
21283-7
GD1A Antibody, IgM
GD1AM

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzyme Immunoassay
Reported:
5-7 days
Additional Information:
Ganglioside GD1a antibody IgM is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

Synonyms:
- Ganglioside GD1a antibody

COLLECTION

Patient Preparation:
Overnight fasting preferred but not required
Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month

PROCESSING

Test Code:
GD1AM
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 389644
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month
RESULT INTERPRETATION

Units:
Titer
Reference Interval:
<1:800
Additional Information:
Ganglioside GD1a antibody IgM is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

ADMINISTRATIVE

CPT Codes:
83520-90
LOINC Codes:
21282-9

COMPLETE VIEW

Available Stat:
No
Test Code:
GD1AM
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzyme Immunoassay
Patient Preparation:
Overnight fasting preferred but not required
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 389644
Units:
Titer
Reference Interval:
<1:800
Synonyms:
- Ganglioside GD1a antibody
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month
Reported:
5-7 days
Additional Information:

Printed 06/07/19
Test information subject to change
Ganglioside GD1a antibody IgM is associated with acute motor axonal neuropathy, sometimes followed by Campylobacter jejuni infections. Ganglioside GD1a antibody IgG can aid in the diagnosis of acute motor axonal neuropathy variant of Guillain-Barre syndrome.

CPT Codes:
83520-90

LOINC Codes:
21282-9
Gentamicin
GENPK, GENTH, GENRN

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Chemistry
Performed:
24 hours per day and 7 days per week
Methodology:
Particle enhanced turbidimetric inhibition immunoassay (Beckman DxC 800)
 Reported:
4 hours
Additional Information:
For desired peak and trough levels in special situations, Click here
Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L.
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top or Light Green top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.2 mL serum or plasma
Remarks:
Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing).
Collect trough samples 30 minutes prior to 3rd or 4th dose.
For patients on hemodialysis collect just prior to and/or 1 hour post dialysis.
For standard dosing draw peak samples 30 minutes after the end of infusion. For ICN extended interval dosing draw peak 30 minutes after end of 4th dose.
Note the exact time of collection on BOTH the sample and the requisition.
Bring to lab immediately for processing if patient also receiving carbenicillin or other high dose penicillin or cephalosporin because prolonged interactions with these drugs (8 hours or more) at room temperature can modify amino groups and interfere with aminoglycoside assay.

PROCESSING

Test Code:
GENPK (Peak), GENTH (Trough), GENRN (Random)
Performing Lab:
Parnassus Chemistry

Printed 06/07/19
Test information subject to change
Specimen Preparation:
Mission Bay and Mount Zion: Refrigerate serum or plasma and send to Parnassus Chemistry

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Therapeutic peak 5-10 mg/L

Trough levels:
Standard dosing <2 mg/L (< 1 mg/L optimum)
Once daily, high dose <1 mg/L (< 0.3 mg/L optimum)
ICN extended interval dosing <2 mg/L (< 1.5 mg/L optimum)
CF extended interval dosing <1 mg/L


Click here for link

Additional Information:
For desired peak and trough levels in special situations, Click here

Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L.

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80170

LOINC Codes:
35668-3

COMPLETE VIEW

Available Stat:
No

Test Code:
GENPK (Peak), GENTH (Trough), GENRN (Random)

Performing Lab:
Parnassus Chemistry

Performed:
24 hours per day and 7 days per week

Methodology:
Particle enhanced turbidimetric inhibition immunoassay (Beckman DxC 800)

Remarks:
Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing).
Collect trough samples 30 minutes prior to 3rd or 4th dose.
For patients on hemodialysis collect just prior to and/or 1 hour post dialysis.
For standard dosing draw peak samples 30 minutes after the end of infusion. For ICN extended interval dosing draw peak 30 minutes after end of 4th dose.

Note the exact time of collection on BOTH the sample and the requisition.

Bring to lab immediately for processing if patient also receiving carbenicillin or other high dose penicillin or cephalosporin because prolonged interactions with these drugs (8 hours or more) at room temperature can modify amino groups and interfere with aminoglycoside assay.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Specimen Preparation:
Mission Bay and Mount Zion: Refrigerate serum or plasma and send to Parnassus Chemistry

Units:
mg/L

Reference Interval:
Therapeutic peak 5-10 mg/L

Trough levels:
Standard dosing <2 mg/L (< 1 mg/L optimum)
Once daily, high dose <1 mg/L (< 0.3 mg/L optimum)
ICN extended interval dosing <2 mg/L (< 1.5 mg/L optimum)
CF extended interval dosing <1 mg/L


Click here for link

Reported:
4 hours

Additional Information:
For desired peak and trough levels in special situations, Click here

Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L.

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
80170

LOINC Codes:
35668-3
Giardia Antigen
P413

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Thursday, day shift
Methodology: EIA
Reported: 1-7 days
Additional Information:
This test should be used only if other parasitic infections not detected by this highly specific procedure are considered unlikely on clinical grounds or have been excluded by routine stool examinations for O&P. The test can be used to follow infected patients for loss of carriage (at no more than weekly intervals), to investigate their contacts, or when despite the failure to demonstrate it by stool examination a high suspicion of Giardia infection persists. Sensitivity of this test for parasite antigen is 96%, compared to a sensitivity of 74% for the microscopic examination of a single stool sample; specificity is thought to be 100%.
Synonyms:
- Giardiasis

COLLECTION

Sample Type: SAF preserved stool
Collect:
SAF vial
Amount to Collect:
See preferred volume
Preferred Volume:
SAF vial filled to red line on label. Do not overfill.
Minimum Volume:
5 mL
Remarks:
SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.
Stability (from collection to initiation):
Room temperature:
Unpreserved stool: 1 hour
Stool in SAF: 2 months
Rejection Criteria:
Unpreserved stool not placed in SAF within 1 hour of collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.
Giardia antigen testing cannot be performed on aspirates. A P401 Ova and Parasite exam can be ordered to look for Giardia microscopically.

PROCESSING

Test Code:
P413
Performing Lab:
   Microbiology

Specimen Preparation:
   Transfer unpreserved stool to SAF preservative upon receipt in lab.

Preferred Volume:
   SAF vial filled to red line on label. Do not overfill.

Minimum Volume:
   5 mL

Rejection Criteria:
   Unpreserved stool not placed in SAF within 1 hour of collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.

   Giardia antigen testing cannot be performed on aspirates. A P401 Ova and Parasite exam can be ordered to look for Giardia microscopically.

Stability (from collection to initiation):
   Room temperature:
     Unpreserved stool: 1 hour
     Stool in SAF: 2 months

RESULT INTERPRETATION

Reference Interval:
   Negative

Additional Information:
   This test should be used only if other parasitic infections not detected by this highly specific procedure are considered unlikely on clinical grounds or have been excluded by routine stool examinations for O&P. The test can be used to follow infected patients for loss of carriage (at no more than weekly intervals), to investigate their contacts, or when-despite the failure to demonstrate it by stool examination a high suspicion of Giardia infection persists. Sensitivity of this test for parasite antigen is 96%, compared to a sensitivity of 74% for the microscopic examination of a single stool sample; specificity is thought to be 100%.

ADMINISTRATIVE

CPT Codes:
   87329

LOINC Codes:
   6412-1

COMPLETE VIEW

Available Stat:
   No

Test Code:
   P413

Performing Lab:
   Microbiology

Performed:
   Thursday, day shift

Methodology:
   EIA

Remarks:
   SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories' draw stations.

Collect:
   SAF vial

Amount to Collect:
See preferred volume

**Sample Type:**
SAF preserved stool

**Preferred Volume:**
SAF vial filled to red line on label. Do not overfill.

**Minimum Volume:**
5 mL

**Rejection Criteria:**
Unpreserved stool not placed in SAF within 1 hour of collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label.

Giardia antigen testing cannot be performed on aspirates. A P401 Ova and Parasite exam can be ordered to look for Giardia microscopically.

**Specimen Preparation:**
Transfer unpreserved stool to SAF preservative upon receipt in lab.

**Reference Interval:**
Negative

**Synonyms:**
- Giardiasis

**Stability (from collection to initiation):**
Room temperature:

Unpreserved stool: 1 hour
Stool in SAF: 2 months

**Reported:**
1-7 days

**Additional Information:**
This test should be used only if other parasitic infections not detected by this highly specific procedure are considered unlikely on clinical grounds or have been excluded by routine stool examinations for O&P. The test can be used to follow infected patients for loss of carriage (at no more than weekly intervals), to investigate their contacts, or when-despite the failure to demonstrate it by stool examination a high suspicion of Giardia infection persists. Sensitivity of this test for parasite antigen is 96%, compared to a sensitivity of 74% for the microscopic examination of a single stool sample; specificity is thought to be 100%.

**CPT Codes:**
87329

**LOINC Codes:**
6412-1
**Gliadin Antibodies, Deamidated (IgG and IgA)**

**GLIA**

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Immunology
- **Performed:** Tuesday (day shift)
- **Methodology:** Chemiluminescence
- **Reported:** 2-8 days

**Additional Information:**

Anti-gliadin antibodies are associated with Celiac Disease (also called gluten-sensitive enteropathy). IgG and/or IgA antibodies can be found, but generally, IgA antibodies are considered more specific for disease, while IgG antibodies are considered more sensitive. This assay uses the deamidated form of gliadin as a substrate, which is considered to have greater diagnostic accuracy in comparison with traditional assays. Testing for antibodies to TTG (tissue transglutaminase) are usually performed in addition to testing for antibodies to gliadin.

Note: Since IgA deficiency is common in patients with celiac disease, serum IgA levels may be useful in patients with negative results for the IgA anti-gliadin assay.

**Synonyms:**
- Celiac disease
- Gluten sensitive enteropathy
- Anti deamidated gliadin antibodies

**COLLECTION**

- **Sample Type:** Serum
- **Collect:** Gold top
- **Amount to Collect:** 2 mL blood
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.5 mL serum
- **Remarks:** Avoid hemolysis

**Unacceptable Conditions:**
- Grossly hemolyzed or icteric samples

**PROCESSING**

- **Test Code:** GLIA
- **Performing Lab:** Immunology
- **Specimen Preparation:** Freeze serum at -20°C
Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed or icteric samples

RESULT INTERPRETATION

Units:
Chemiluminescence units (CU)

Reference Interval:
Gliadin antibody (IgG)
   Negative  <20.0 CU
   Weak Positive  20.0-30.0 CU
   Positive   > 30.0 CU

Gliadin Antibody (IgA)
   Negative  <20.0 CU
   Weak Positive  20.0-30.0 CU
   Positive   > 30.0 CU

Additional Information:
Anti-gliadin antibodies are associated with Celiac Disease (also called gluten-sensitive enteropathy). IgG and/or IgA antibodies can be found, but generally, IgA antibodies are considered more specific for disease, while IgG antibodies are considered more sensitive. This assay uses the deamidated form of gliadin as a substrate, which is considered to have greater diagnostic accuracy in comparison with traditional assays. Testing for antibodies to TTG (tissue transglutaminase) are usually performed in addition to testing for antibodies to gliadin.

Note: Since IgA deficiency is common in patients with celiac disease, serum IgA levels may be useful in patients with negative results for the IgA anti-gliadin assay.

ADMINISTRATIVE

CPT Codes:
  83516 X 2

LOINC Codes:
  57776-7

COMPLETE VIEW

Available Stat:
No

Test Code:
GLIA

Performing Lab:
Immunology

Performed:
Tuesday (day shift)

Methodology:
Chemiluminescence

Remarks:
Avoid hemolysis

Collect:
Gold top

Amount to Collect:
2 mL blood
Sample Type: Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed or icteric samples

Specimen Preparation:
Freeze serum at -20°C

Units:
Chemiluminescence units (CU)

Reference Interval:
Gliadin antibody (IgG)
Negative <20.0 CU
Weak Positive 20.0-30.0 CU
Positive > 30.0 CU

Gliadin Antibody (IgA)
Negative <20.0 CU
Weak Positive 20.0-30.0 CU
Positive > 30.0 CU

Synonyms:
- Celiac disease
- gluten sensitive enteropathy
- anti deamidated gliadin antibodies

Reported:
2-8 days

Additional Information:
Anti-gliadin antibodies are associated with Celiac Disease (also called gluten-sensitive enteropathy). IgG and/or IgA antibodies can be found, but generally, IgA antibodies are considered more specific for disease, while IgG antibodies are considered more sensitive. This assay uses the deamidated form of gliadin as a substrate, which is considered to have greater diagnostic accuracy in comparison with traditional assays. Testing for antibodies to TTG (tissue transglutaminase) are usually performed in addition to testing for antibodies to gliadin.

Note: Since IgA deficiency is common in patients with celiac disease, serum IgA levels may be useful in patients with negative results for the IgA anti-gliadin assay.

CPT Codes:
83516 X 2

LOINC Codes:
57776-7
Glomerular Basement Membrane Antibody
AGBM

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test run Tuesday and Thursday. Turnaround time: 2-7 days.

Synonyms:
- anti-GBM
- anti-glomerular basement membrane antibody
- Good pasture's syndrome

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
AGBM
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 93294P.
Preferred Volume:
2 mL serum
Minimum Volume:
0.2 mL serum

RESULT INTERPRETATION

Units:
EU/mL
Reference Interval:
Negative: < 3.0 EU/mL
Positive: >= 3.0 EU/mL
**ADMINISTRATIVE**

CPT Codes:
- 83520-90

LOINC Codes:
- 30343-8

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- AGBM

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- EIA

Collect:
- Gold top

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum

Preferred Volume:
- 2 mL serum

Minimum Volume:
- 0.2 mL serum

Specimen Preparation:
- Refrigerate. Order Quest # 93294P.

Units:
- EU/mL

Reference Interval:
- Negative: < 3.0 EU/mL
- Positive: >= 3.0 EU/mL

Synonyms:
- anti-GBM
- anti-glomerular basement membrane antibody
- Good pasture's syndrome

Reported:
- Test run Tuesday and Thursday. Turnaround time: 2-7 days.

CPT Codes:
- 83520-90

LOINC Codes:
- 30343-8
**Glucagon**

**GLGN**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Extraction, RIA

**Reported:**
- Set up 2x per week. Turnaround time: 5-7 days.

### COLLECTION

**Patient Preparation:**
- Overnight fasting before specimen collection is required.

**Sample Type:**
- EDTA Plasma

**Collect:**
- Lavender top (on ice)

**Amount to Collect:**
- 6 mL blood

**Preferred Volume:**
- 3 mL plasma

**Minimum Volume:**
- 1.1 mL plasma

**Remarks:**
- Pre-chill tube before collection. Bring sample immediately to lab on ice. To avoid delays in turnaround time when requesting multiple tests on frozen samples, please submit separate frozen specimens for each test requested.

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 1 week, frozen at -20°C 4 weeks.

**Unacceptable Conditions:**
- Not delivered on ice

### PROCESSING

**Test Code:**
- GLGN

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Freeze plasma at -20°C. Order Quest # 519 For B&T patients, draw 7 mL blood into chilled EDTA (lavender-stopper) tube. Add 0.5 mL Trasylol (Aprotinin) (10,000 KIU/mL). Mix well, centrifuge, transfer plasma to specially labeled transport tube and freeze. Contact LabCorp’s Supply Department for collection kit.

**Preferred Volume:**
- 3 mL plasma

**Minimum Volume:**
- 1.1 mL plasma

**Unacceptable Conditions:**
- Not delivered on ice
Stability (from collection to initiation):
  Room temperature 1 week, refrigerated 1 week, frozen at -20°C 4 weeks.

RESULT INTERPRETATION

Units:
  pg/mL

Reference Interval:
  Cord Blood: <= 215 pg/mL
  Day 1: <= 240 pg/mL
  Day 2: <= 400 pg/mL
  Day 3: <= 420 pg/mL
  Days 4-14: <= 148 pg/mL
  Adults: <= 60 pg/mL

ADMINISTRATIVE

CPT Codes:
  82943-90

LOINC Codes:
  2338-2

COMPLETE VIEW

Available Stat:
  No

Test Code:
  GLGN

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Extraction, RIA

Patient Preparation:
  Overnight fasting before specimen collection is required.

Remarks:
  Pre-chill tube before collection. Bring sample immediately to lab on ice. To avoid delays in turnaround time when requesting multiple tests on frozen samples, please submit separate frozen specimens for each test requested.

Collect:
  Lavender top (on ice)

Amount to Collect:
  6 mL blood

Sample Type:
  EDTA Plasma

Preferred Volume:
  3 mL plasma

Minimum Volume:
  1.1 mL plasma

Unacceptable Conditions:
  Not delivered on ice

Specimen Preparation:
  Freeze plasma at -20°C. Order Quest # 519 For B&T patients, draw 7 mL blood into chilled EDTA (lavender-stopper) tube. Add 0.5 mL Trasylol (Aprotinin) (10,000 KIU/mL). Mix well, centrifuge, transfer plasma to specially labeled transport tube and freeze. Contact LabCorp’s Supply Department for collection kit.

Units:
pg/mL

Reference Interval:
- Cord Blood: <= 215 pg/mL
- Day 1: <= 240 pg/mL
- Day 2: <= 400 pg/mL
- Day 3: <= 420 pg/mL
- Days 4-14: <= 148 pg/mL
- Adults: <= 60 pg/mL

Stability (from collection to initiation):
- Room temperature 1 week, refrigerated 1 week, frozen at -20C 4 weeks.

Reported:
- Set up 2x per week. Turnaround time: 5-7 days.

CPT Codes:
- 82943-90

LOINC Codes:
- 2338-2
Glucose, 24 hour urine

ORDERING

Available Stat:
No

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
  Parnassus: Oxygen consumption (O2 electrode with glucose oxidase)

Reported:
  Same or next day

Additional Information:
  To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

Synonyms:
  - Diabetes mellitus
  - Quantitative sugar, urine

COLLECTION

Sample Type:
  Timed urine collection

Collect:
  24 hour urine collection container

Amount to Collect:
  Entire 24 hour urine output

Preferred Volume:
  5 mL urine

Minimum Volume:
  0.2 mL urine

Remarks:
  Sample compatible with all urine tests collected in a plain container EXCEPT Osmolality. Obtain container from Specimen Receiving. Refrigerate the collection container during the collection period.

Stability (from collection to initiation):
  Refrigerated 2 days

Unacceptable Conditions:
  Container not refrigerated during collection

PROCESSING

Test Code:
  GLUU

Test Group:
  Glucose

Performing Lab:
  Parnassus & Mission Bay Chemistry

Preferred Volume:
  5 mL urine

Minimum Volume:
  0.2 mL urine
**Unacceptable Conditions:**
- Container not refrigerated during collection

**Stability (from collection to initiation):**
- Refrigerated 2 days

---

**RESULT INTERPRETATION**

**Units:**
- g/D

**Reference Interval:**
- <0.5 g/D

**Additional Information:**
- To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

---

**ADMINISTRATIVE**

**CPT Codes:**
- 82945

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**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- GLUU

**Test Group:**
- Glucose

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 7 days per week from 8:00 AM to midnight only.

**Methodology:**
- Parnassus: Oxygen consumption (O2 electrode with glucose oxidase)

**Remarks:**
- Sample compatible with all urine tests collected in a plain container EXCEPT Osmolality. Obtain container from Specimen Receiving. Refrigerate the collection container during the collection period.

**Collect:**
- [24 hour urine collection container](#)

**Amount to Collect:**
- Entire 24 hour urine output

**Sample Type:**
- Timed urine collection

**Preferred Volume:**
- 5 mL urine

**Minimum Volume:**
- 0.2 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection

**Units:**
- g/D

**Reference Interval:**
- <0.5 g/D

**Synonyms:**
- Diabetes mellitus
- Quantitative sugar, urine

**Stability (from collection to initiation):**

Refrigerated 2 days

**Reported:**

Same or next day

**Additional Information:**

To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

**CPT Codes:**

82945
Glucose, Body fluid

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result. All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

PROCESSING

Test Code:
GLBF

Test Group:
Glucose

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result. All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

ADMINISTRATIVE

CPT Codes:
82945

LOINC Codes:
2344-0

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
GLBF

Test Group:
Glucose

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body Fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Units:
mg/dL

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result. All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

CPT Codes:

82945

LOINC Codes:

2344-0
Glucose, CSF
GLC

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Parnassus: Oxygen consumption (O2 electrode with glucose oxidase)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
To convert mg/dl to mmol/L (SI units) multiply by 0.0555. CSF levels are usually > 55% of serum glucose and > 40 mg/dL. As serum glucose rises above 200 mg/dL the CSF/serum ratio falls from about 0.55 to a minimum of 0.31.

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
3 mL CSF
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.2 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Stability (from collection to initiation):
Refrigerated 10 days.

PROCESSING

Test Code:
GLC
Test Group:
Glucose
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.2 mL CSF
Stability (from collection to initiation):
Refrigerated 10 days.

RESULT INTERPRETATION
Units:

mg/dL

Reference Interval:
40-70 mg/dL

Critical Values:
<30 mg/dL

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0555. CSF levels are usually > 55% of serum glucose and > 40 mg/dL. As serum glucose rises above 200 mg/dL the CSF/serum ratio falls from about 0.55 to a minimum of 0.31.

ADMINISTRATIVE

CPT Codes:
82945

LOINC Codes:
2342-4

COMPLETE VIEW

Available Stat:
Yes

Test Code:
GLC

Test Group:
Glucose

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Parnassus: Oxygen consumption (O2 electrode with glucose oxidase)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
CSF tube or sterile collection tube

Amount to Collect:
3 mL CSF

Sample Type:
CSF

Preferred Volume:
0.5 mL CSF

Minimum Volume:
0.2 mL CSF

Units:
mg/dL

Reference Interval:
40-70 mg/dL

Critical Values:
<30 mg/dL

Stability (from collection to initiation):
Refrigerated 10 days.

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0555. CSF levels are usually > 55% of serum glucose and > 40 mg/dL. As serum glucose rises above 200 mg/dL the CSF/serum ratio falls from about 0.55 to a minimum of 0.31.

Printed 06/07/19
Test information subject to change
glucose rises above 200 mg/dL the CSF/serum ratio falls from about 0.55 to a minimum of 0.31.

CPT Codes:
82945

LOINC Codes:
2342-4
Glucose, Fasting, Plasma / Serum

FBS

**ORDERING**

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Oxygen consumption (O2 electrode with glucose oxidase)

**Additional Information:**
- To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

The stated reference ranges reflect criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association (Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels. The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day. Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes. Fasting levels < 50 mg/dL are frequently found in apparently normal individuals after 1-3 days of fasting, especially in women and children; levels as low as 20 mg/dL may be normal in premature (Pediatrics 1990;85:834).

Note that fasting whole blood glucose concentrations are approximately 12-15% lower than plasma glucose concentrations and that many point of care whole blood glucose monitors automatically convert results to plasma values. Whole blood glucose results can be manually converted to plasma values by multiplying whole blood results by 1.12, based on the assumption that the sample hematocrit is 45%. Note also that glucose concentrations in capillary blood are higher than those in venous blood. In fasting samples, the differences are small (2 to 5 mg/dL), however, in non-fasting samples, differences as high as 70 mg/dL may be observed.

**Synonyms:**
- Diabetes mellitus
- FBS
- Fasting blood sugar

**COLLECTION**

**Patient Preparation:**
- Patients should have fasted (no caloric intake) for a minimum of 8 hours before testing.

**Sample Type:**
- Plasma or serum

**Collect:**
- Lt Green top preferred, Gold top and Gray top acceptable

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL plasma or serum

**Minimum Volume:**
- 0.2 mL plasma or serum

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days

**PROCESSING**

**Test Code:**
- FBS

**Test Group:**
Glucose

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
Normal: 70-99 mg/dL
Impaired fasting glucose ("pre-diabetes"): 100-125 mg/dL
Diabetes mellitus: > 125 mg/dL

Critical Values:
Neonates: < 30 mg/dL or > 170 mg/dL
>= 1 month old: < 50 mg/dL or > 500 mg/dL

Additional Information:
To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

The stated reference ranges reflect criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association (Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels. The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day. Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes. Fasting levels < 50 mg/dL are frequently found in apparently normal individuals after 1-3 days of fasting, especially in women and children; levels as low as 20 mg/dL may be normal in prematurely (Pediatrics 1990;85:834).

Note that fasting whole blood glucose concentrations are approximately 12-15% lower than plasma glucose concentrations and that many point of care whole blood glucose monitors automatically convert results to plasma values. Whole blood glucose results can be manually converted to plasma values by multiplying whole blood results by 1.12, based on the assumption that the sample hematocrit is 45%. Note also that glucose concentrations in capillary blood are higher than those in venous blood. In fasting samples, the differences are small (2 to 5 mg/dL), however, in non-fasting samples, differences as high as 70 mg/dL may be observed.

ADMINISTRATIVE

CPT Codes:
82947

LOINC Codes:
1558-6

COMPLETE VIEW

Available Stat:
Yes

Test Code:
FBS

Test Group:
Glucose

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

**Patient Preparation:**
Patients should have fasted (no caloric intake) for a minimum of 8 hours before testing.

**Collect:**
Lt Green top preferred, Gold top and Gray top acceptable.

**Amount to Collect:**
1 mL blood

**Sample Type:**
Plasma or serum

**Preferred Volume:**
0.5 mL plasma or serum

**Minimum Volume:**
0.2 mL plasma or serum

**Units:**
mg/dL

**Reference Interval:**
Normal: 70-99 mg/dL
Impaired fasting glucose ("pre-diabetes"): 100-125 mg/dL
Diabetes mellitus: > 125 mg/dL

**Critical Values:**
Neonates: < 30 mg/dL or > 170 mg/dL
>= 1 month old: < 50 mg/dL or > 500 mg/dL

**Syonyms:**
- Diabetes mellitus
- FBS
- fasting blood sugar

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days

**Additional Information:**
To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

The stated reference ranges reflect criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association (Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels. The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day. Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes. Fasting levels < 50 mg/dL are frequently found in apparently normal individuals after 1-3 days of fasting, especially in women and children; levels as low as 20 mg/dL may be normal in prematures (Pediatrics 1990;85:834).

Note that fasting whole blood glucose concentrations are approximately 12-15% lower than plasma glucose concentrations and that many point of care whole blood glucose monitors automatically convert results to plasma values. Whole blood glucose results can be manually converted to plasma values by multiplying whole blood results by 1.12, based on the assumption that the sample hematocrit is 45%. Note also that glucose concentrations in capillary blood are higher than those in venous blood. In fasting samples, the differences are small (2 to 5 mg/dL), however, in non-fasting samples, differences as high as 70 mg/dL may be observed.

**CPT Codes:**
82947

**LOINC Codes:**
1558-6
Glucose, non-fasting, Plasma / Serum
GLU

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

The above reference ranges reflect new criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association ((Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels).
The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day.
Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes.


Synonyms:
- Diabetes mellitus

COLLECTION

Sample Type:
Plasma or serum

Collect:
Light green top preferred, Gold top acceptable (Gray or Dark Green top acceptable)

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

PROCESSING

Test Code:
GLU

Test Group:
Glucose

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Specimen Preparation:
Note on specimen if sample was from a gray top tube.

Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:

Pediatrics:
<1 month 55-115 mg/dL
1 month - 1 year 55-123 mg/dL
1 year - 17 years 56-145 mg/dL

Adults (>= 18 years old):
Normal 70-199 mg/dL
Impaired glucose tolerance 140-199 mg/dL*
Diabetes mellitus >199 mg/dL**

* If measured 2 hour postprandial
** AND Sx of diabetes such as polyuria, polydipsia or unexplained weight loss

2. Normal range for 1 month to <18 years adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. ADA guidelines used for adults.

Critical Values:
Neonates < 30 mg/dL or > 170 mg/dL >= 1 month old < 50 mg/dL or > 500 mg/dL

Additional Information:
To convert mg/dl to mmol/L (SI units) multiply by 0.0555.

The above reference ranges reflect new criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association (Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels. The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day. Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes.


ADMINISTRATIVE

CPT Codes:
82947

LOINC Codes:
2345-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
GLU

Test Group:
Glucose
Performing Lab:
   Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
   Test available 24 hours per day 7 days per week
Methodology:
   Oxygen consumption (O2 electrode with glucose oxidase)
Collect:
   Light green top preferred, Gold top acceptable (Gray or Dark Green top acceptable)
Amount to Collect:
   1 mL blood
Sample Type:
   Plasma or serum
Preferred Volume:
   0.5 mL plasma or serum
Minimum Volume:
   0.2 mL plasma or serum
Specimen Preparation:
   Note on specimen if sample was from a gray top tube.
Units:
   mg/dL
Reference Interval:
   Pediatrics:
   <1 month 55-115 mg/dL
   1 month - 1 year 55-123 mg/dL
   1 year - 17 years 56-145 mg/dL
   
   Adults (>= 18 years old):
   Normal 70-199 mg/dL
   Impaired glucose tolerance 140-199 mg/dL*
   Diabetes mellitus >199 mg/dL**

* If measured 2 hour postprandial
** AND Sx of diabetes such as polyuria, polydipsia or unexplained weight loss

2. Normal range for 1 month to <18 years adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. ADA guidelines used for adults.

Critical Values:
   Neonates < 30 mg/dL or > 170 mg/dL >= 1 month old < 50 mg/dL or > 500 mg/dL

Synonyms:
   Diabetes mellitus

Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 2 days

Reported:
   STAT 1 hour, Routine 4 hours

Additional Information:
   To convert mg/dL to mmol/L (SI units) multiply by 0.0555.

The above reference ranges reflect new criteria for the diagnosis of diabetes mellitus established by the American Diabetes Association ((Diabetes Care, Volume 34, Supplement 1, January 2011). All recommendations of the ADA are based upon plasma or serum levels). The diagnosis of diabetes mellitus should NOT be made until one of these abnormalities has been confirmed on a subsequent day. Impaired glucose tolerance/impaired fasting glucose implies an increased risk of future diabetes.

CPT Codes:
  82947
LOINC Codes:
  2345-7
Glucose, random urine
GLUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)
Reported:
Same or next day
Synonyms:
- Diabetes mellitus
- Quantitative sugar, urine

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 4 hours

PROCESSING

Test Code:
GLUR
Test Group:
Glucose
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
5 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 4 hours

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
82945
LOINC Codes:
2350-7

COMPLETE VIEW

Available Stat:
No
Test Code:
GLUR
Test Group:
Glucose
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)
Collect:
Urine cup
Amount to Collect:
20 mL urine
Sample Type:
Random urine
Preferred Volume:
5 mL urine
Minimum Volume:
0.2 mL urine
Units:
mg/dL
Reference Interval:
Negative
Synonyms:
- Diabetes mellitus
- Quantitative sugar, urine
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 4 hours
Reported:
Same or next day
CPT Codes:
82945
LOINC Codes:
2350-7
Glucose, whole blood (See Blood Gas Panel)
NGLU

ORDERING

Available Stat:  
Yes
Performing Lab:  
Parnassus Blood Gas Laboratory  
Mission Bay Hospital Laboratory  
Mount Zion Clinical Laboratory
Performed:  
Test available 24 hours per day 7 days per week
Methodology:  
Oxygen consumption (O2 electrode with glucose oxidase)
Reported:  
STAT 1 hour, Routine 4 hours
Additional Information:  
Glucose results from whole blood samples tested on the blood gas analyzers are based on direct measurements of glucose in the water phase of the samples and ordinarily provide values similar to those obtained by measuring plasma glucose concentrations with the general chemistry analyzer in the central laboratory.
Synonyms:  
• Diabetes mellitus

COLLECTION

Sample Type:  
Heparinized whole blood
Collect:  
Plastic syringe containing 100 U of dry heparin
Amount to Collect:  
3 mL blood
Preferred Volume:  
3 mL blood
Minimum Volume:  
1 mL blood
Remarks:  
Transport immediately to laboratory
Unacceptable Conditions:  
Delivered to lab > 30 min after collection

PROCESSING

Test Code:  
NGLU
Test Group:  
Glucose
Performing Lab:  
Parnassus Blood Gas Laboratory  
Mission Bay Hospital Laboratory  
Mount Zion Clinical Laboratory
Preferred Volume:  
3 mL blood
Minimum Volume:  
1 mL blood
Unacceptable Conditions:
Delivered to lab > 30 min after collection

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:

Pediatrics:
<1 month       55-115 mg/dL
1 month - 1 year       55-123 mg/dL
1 year - 17 years       56-145 mg/dL

Adults (>= 18 years old):
Normal                 70-199 mg/dL
Impaired glucose tolerance 140-199 mg/dL*
Diabetes mellitus       > 199 mg/dL**

* measured 2 hour postprandial
** AND Sx of diabetes such as polyuria, polydipsia or unexplained weight loss

2. Normal range for 1 month to <18 years adapted from Beckman Coulter’s "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. ADA guidelines used for adults.

Critical Values:
Neonates: 170 mg/dL
>= 1 month old: 500 mg/dL

Additional Information:
Glucose results from whole blood samples tested on the blood gas analyzers are based on direct measurements of glucose in the water phase of the samples and ordinarily provide values similar to those obtained by measuring plasma glucose concentrations with the general chemistry analyzer in the central laboratory.

ADMINISTRATIVE

CPT Codes:
82947

LOINC Codes:
2339-0

COMPLETE VIEW

Available Stat:
Yes

Test Code:
NGLU

Test Group:
Glucose

Performing Lab:
Parnassus Blood Gas Laboratory
Mission Bay Hospital Laboratory
Mount Zion Clinical Laboratory

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Oxygen consumption (O2 electrode with glucose oxidase)

Remarks:
Transport immediately to laboratory

Collect:
Plastic syringe containing 100 U of dry heparin

Amount to Collect:
3 mL blood

Sample Type:
Heparinized whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Delivered to lab > 30 min after collection

Units:
mg/dL

Reference Interval:

Pediatrics:
- <1 month: 55-115 mg/dL
- 1 month - 1 year: 55-123 mg/dL
- 1 year - 17 years: 56-145 mg/dL

Adults (>= 18 years old):
- Normal: 70-199 mg/dL
- Impaired glucose tolerance: 140-199 mg/dL
- Diabetes mellitus: > 199 mg/dL

* measured 2 hour postprandial
** AND Sx of diabetes such as polyuria, polydipsia or unexplained weight loss

2. Normal range for 1 month to <18 years adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. ADA guidelines used for adults.

Critical Values:
- Neonates: 170 mg/dL
- >= 1 month old: 500 mg/dL

Synonyms:
- Diabetes mellitus

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
Glucose results from whole blood samples tested on the blood gas analyzers are based on direct measurements of glucose in the water phase of the samples and ordinarily provide values similar to those obtained by measuring plasma glucose concentrations with the general chemistry analyzer in the central laboratory.

CPT Codes:
- 82947

LOINC Codes:
- 2339-0
Glucose-6-Phosphate Dehydrogenase Screen, RBC, quantitative
G6PD

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
End point UV Spectrophotometry
Reported:
Test performed Tuesday-Saturday. Turnaround time: 2-5 days.
Additional Information:
To convert U/g Hgb to MU/mol Hgb (SI units) multiply by 0.0645.
Synonyms:
• G-6-PDH
• G6PD
• G6PDH
• red cell enzymes

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
4 mL blood
Preferred Volume:
4 mL blood
Minimum Volume:
0.5 mL blood

PROCESSING

Test Code:
G6PD
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample. Do not centrifuge. Order Quest # 23572P. Ship refrigerated.
Preferred Volume:
4 mL blood
Minimum Volume:
0.5 mL blood

RESULT INTERPRETATION

Units:
U/g Hgb
Reference Interval:
4.6-13.5 U/g Hgb

Additional Information:
To convert U/g Hgb to MU/mol Hgb (SI units) multiply by 0.0645.

ADMINISTRATIVE

CPT Codes:
82955-90

LOINC Codes:
2356-4

COMPLETE VIEW

Available Stat:
No

Test Code:
G6PD

Performing Lab:
Quest

Sendout:
Yes

Methodology:
End point UV Spectrophotometry

Collect:
Lavender top

Amount to Collect:
4 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
4 mL blood

Minimum Volume:
0.5 mL blood

Specimen Preparation:
Refrigerate sample. Do not centrifuge. Order Quest # 23572P. Ship refrigerated.

Units:
U/g Hgb

Reference Interval:
4.6-13.5 U/g Hgb

Synonyms:
- G-6-PDH
- G6PD
- G6PDH
- red cell enzymes

Reported:
Test performed Tuesday-Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert U/g Hgb to MU/mol Hgb (SI units) multiply by 0.0645.

CPT Codes:
82955-90

LOINC Codes:
2356-4
Glycine, CSF:Plasma ratio

ORDERING

Available Stat:
No
Performing Lab:
Lucille-Packard Childrens Hospital

COLLECTION

Patient Preparation:
Patients must be fasting for at least 4 hours before sample collection.
The test request should be accompanied by a brief clinical history, the tentative diagnosis, and a listing of drugs, x-rays, infant formula or dietary therapy administered within the previous 3 days.

Sample Type:
CSF & heparinized plasma
Collect:
CSF tube or sterile collection tube and Dark Green top
Remarks:
Submit both plasma and CSF samples, following the collection instructions for plasma under Amino Acids, Quantitative, 1-5 only. CSF specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Group:
Glycine
Sendout:
Yes
Performing Lab:
Lucille-Packard Childrens Hospital

RESULT INTERPRETATION

Units:
Ratio
Reference Interval:
CSF/plasma ratio: 0.02-0.05

COMPLETE VIEW

Available Stat:
No
Test Group:
Glycine
Performing Lab:
Lucille-Packard Childrens Hospital
Sendout:
Yes
Patient Preparation:
Patients must be fasting for at least 4 hours before sample collection.
The test request should be accompanied by a brief clinical history, the tentative diagnosis, and a listing of drugs, x-rays, infant formula
or dietary therapy administered within the previous 3 days.

Remarks:
Submit both plasma and CSF samples, following the collection instructions for plasma under Amino Acids, Quantitative, 1-5 only. CSF specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
CSF tube or sterile collection tube and Dark Green top

Sample Type:
CSF & heparinized plasma

Units:
Ratio

Reference Interval:
CSF/plasma ratio: 0.02-0.05
GM-1 Antibodies, IgG and IgM
GM1AB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
3-5 days
Synonyms:
- GM-1 antibodies
- Asialo-GM1 antibodies
- Anti-GM1 antibodies

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month.
Rejection Criteria:
Received thawed

PROCESSING

Test Code:
GM1AB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Spin sample and freeze aliquot, Ship to China Basis frozen.
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Rejection Criteria:
Received thawed
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month.
RESULT INTERPRETATION

Units:
Titer
Reference Interval:
<1:800

ADMINISTRATIVE

CPT Codes:
83520-90

COMPLETE VIEW

Available Stat:
No
Test Code:
GM1AB
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Immunoassay
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Rejection Criteria:
Received thawed
Specimen Preparation:
Spin sample and freeze aliquot, Ship to China Basis frozen.
Units:
Titer
Reference Interval:
<1:800
Synonyms:
- GM-1 antibodies
- Asialo-GM1 antibodies
- Anti-GM1 antibodies
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month.
Reported:
3-5 days
CPT Codes:
83520-90
GML Exome Family Member Peripheral blood draw
GMLEXF

ORDERING

Performing Lab:
    Institute for Human Genetics, Genomic Medicine Lab
Additional Information:
    Specimen sent to GML
Synonyms:
    • Peripheral blood draw for exome

COLLECTION

Sample Type:
    Peripheral blood
Collect:
    EDTA (lavender top)
Amount to Collect:
    3 mL
Preferred Volume:
    3 mL
Minimum Volume:
    1 mL
Stability (from collection to initiation):
    Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.

PROCESSING

Test Code:
    GMLEXF
Performing Lab:
    Institute for Human Genetics, Genomic Medicine Lab
Specimen Preparation:
    Peripheral blood sent on the courier to Central Processing Parnassus. Central Processing Parnassus: Upon receipt, place samples in refrigerator in container labeled GML Laboratory and call 415-502-3560 for pickup (Monday -Friday day shift only).
Preferred Volume:
    3 mL
Minimum Volume:
    1 mL
Stability (from collection to initiation):
    Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.

RESULT INTERPRETATION

Additional Information:
    Specimen sent to GML

ADMINISTRATIVE

CPT Codes:
    36415
Test Code: GMLEXF
Performing Lab: Institute for Human Genetics, Genomic Medicine Lab
Collect: EDTA (lavender top)
Amount to Collect: 3 mL
Sample Type: Peripheral blood
Preferred Volume: 3 mL
Minimum Volume: 1 mL
Specimen Preparation: Peripheral blood sent on the courier to Central Processing Parnassus. Central Processing Parnassus: Upon receipt, place samples in refrigerator in container labeled GML Laboratory and call 415-502-3560 for pickup (Monday -Friday day shift only).
Synonyms: Peripheral blood draw for exome
Stability (from collection to initiation): Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.
Additional Information: Specimen sent to GML
CPT Codes: 36415
GML Exome Proband Peripheral blood draw
GMLEXP

ORDERING
Performing Lab:
Institute for Human Genetics, Genomic Medicine Lab
Additional Information:
Specimen sent to GML
Synonyms:
• Peripheral blood draw for exome

COLLECTION
Sample Type:
Peripheral blood
Collect:
EDTA (lavender top)
Amount to Collect:
3 mL
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Stability (from collection to initiation):
Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.

PROCESSING
Test Code:
GMLEXP
Performing Lab:
Institute for Human Genetics, Genomic Medicine Lab
Specimen Preparation:
Peripheral blood sent on the courier to Central Processing Parnassus.
Central Processing Parnassus: Upon receipt, place samples in refrigerator in container labeled GML Laboratory and call 415-502-3560 for pickup (Monday -Friday day shift only).
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Stability (from collection to initiation):
Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.

RESULT INTERPRETATION
Additional Information:
Specimen sent to GML

ADMINISTRATIVE
Printed 06/07/19
Test information subject to change
CPT Codes:
36415

COMPLETE VIEW

Test Code:
GMLEXP

Performing Lab:
Institute for Human Genetics, Genomic Medicine Lab

Collect:
EDTA (lavender top)

Amount to Collect:
3 mL

Sample Type:
Peripheral blood

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Specimen Preparation:
Peripheral blood sent on the courier to Central Processing Parnassus.

Central Processing Parnassus: Upon receipt, place samples in refrigerator in container labeled GML Laboratory and call 415-502-3560 for pickup (Monday - Friday day shift only).

Synonyms:
• Peripheral blood draw for exome

Stability (from collection to initiation):
Whole blood is stable refrigerated for 1 week. Please refrigerate samples over the weekend or holidays at 4°C for next business day pick up.

Additional Information:
Specimen sent to GML

CPT Codes:
36415
GQ1B Antibody, IgG
GQ1B

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzyme Immunoassay
Reported:
5-7 days
Additional Information:
Measuring IgG antibodies to GQ1b ganglioside in serum as an aid in diagnosis of acute and chronic neuropathies.
Synonyms:
• Ganglioside GD1a antibody

COLLECTION

Patient Preparation:
Overnight fasting preferred but not required
Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month

PROCESSING

Test Code:
GQ1B
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 389644
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION
Units:
  Titer
Reference Interval:
  <1:100
Additional Information:
  Measuring IgG antibodies to GQ1b ganglioside in serum as an aid in diagnosis of acute and chronic neuropathies.

**ADMINISTRATIVE**

CPT Codes:
  83520-90
LOINC Codes:
  14254-7

**COMPLETE VIEW**

Available Stat:
  No
Test Code:
  GQ1B
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Enzyme Immunoassay
Patient Preparation:
  Overnight fasting preferred but not required
Collect:
  Gold top or Red top
Amount to Collect:
  2 mL blood
Sample Type:
  Serum
Preferred Volume:
  1 mL serum
Minimum Volume:
  0.2 mL serum
Specimen Preparation:
  Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 389644
Units:
  Titer
Reference Interval:
  <1:100
Synonyms:
  - Ganglioside GD1a antibody
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 1 week, frozen 1 month
Reported:
  5-7 days
Additional Information:
  Measuring IgG antibodies to GQ1b ganglioside in serum as an aid in diagnosis of acute and chronic neuropathies.
CPT Codes:
  83520-90
LOINC Codes:
14254-7
Gram Stain
P057

ORDERING

Available Stat:
Sterile sites 24x7, Non-sterile sites 7:30 AM-11:30 PM

Performing Lab:
Routine orders: Microbiology
STAT orders: Hematology at Parnassus & Mission Bay

Note: Mount Zion STATs are performed by Microbiology at China Basin.

Performed:
Daily

See information under ‘Available stat’ for stat testing availability

Methodology:
Gram stain and Microscopy

Reported:
STAT: 1 hour
Routine: Same or next day

Additional Information:
Normally sterile site specimens include CSF and other sterile body fluids (e.g. vitreous, pleural, peritoneal, ascites, amniotic, or joint fluids, bile, dialysates), sterile body tissues, and other specimens from specialized invasive procedures (e.g. bronchoalveolar lavage), and transfused blood product in the case of a transfusion reaction.

For diagnosis of bacterial vaginosis or yeast infection on vaginal exudate, order Vaginal smear for Bacterial vaginosis/yeast.

Synonyms:
- bacterial smear

COLLECTION

Sample Type:
Respiratory, urine*, genital, wound*, CSF**, body fluid**, unfixed tissue*

* considered 'sterile' if collected in the OR or by sterile means
** considered normally sterile sites

See Additional information

Collect:
CSF: CSF tube or sterile tube
Fluids: Sterile tube
Tissue: Anaerobic transport medium or sterile container if large
Swabs: Amies charcoal transport medium
Urine: Urine cup or red-top vacutainer tube
Sputum: Clean container

PROCESSING

Test Code:
P057

Performing Lab:
Routine orders: Microbiology
STAT orders: Hematology at Parnassus & Mission Bay

Note: Mount Zion STATs are performed by Microbiology at China Basin.
## Result Interpretation

**Critical Values:**
Positive gram stains on samples from normally sterile sites, except urine (first positive smear only)

**Additional Information:**
Normally sterile site specimens include CSF and other sterile body fluids (e.g. vitreous, pleural, peritoneal, ascites, amniotic, or joint fluids, bile, dialysates), sterile body tissues, and other specimens from specialized invasive procedures (e.g. bronchoalveolar lavage), and transfused blood product in the case of a transfusion reaction.

For diagnosis of bacterial vaginosis or yeast infection on vaginal exudate, order Vaginal smear for Bacterial vaginosis/yeast.

## Administrative

**CPT Codes:**
- 87205

**LOINC Codes:**
- 664-3

## Complete View

**Available Stat:**
- Sterile sites 24x7, Non-sterile sites 7:30 AM-11:30 PM

**Test Code:**
- P057

**Performing Lab:**
- Routine orders: Microbiology
- STAT orders: Hematology at Parnassus & Mission Bay

**Note:** Mount Zion STATs are performed by Microbiology at China Basin.

**Performed:**
- Daily

See information under 'Available stat' for stat testing availability

**Methodology:**
- Gram stain and Microscopy

**Collect:**
- CSF: CSF tube or sterile tube
- Fluids: Sterile tube
- Tissue: Anaerobic transport medium or sterile container if large
- Swabs: Amies charcoal transport medium
- Urine: Urine cup or red-top vacutainer tube
- Sputum: Clean container

**Sample Type:**
- Respiratory, urine*, genital, wound*, CSF**, body fluid**, unfixed tissue*

* considered ‘sterile’ if collected in the OR or by sterile means

** considered normally sterile sites

See Additional information

**Critical Values:**
Positive gram stains on samples from normally sterile sites, except urine (first positive smear only)

**Synonyms:**
- bacterial smear

**Reported:**
- STAT: 1 hour
- Routine: Same or next day

**Additional Information:**
Normally sterile site specimens include CSF and other sterile body fluids (e.g. vitreous, pleural, peritoneal, ascites, amniotic, or joint fluids, bile, dialysates), sterile body tissues, and other specimens from specialized invasive procedures (e.g. bronchoalveolar lavage), and transfused blood product in the case of a transfusion reaction.

For diagnosis of bacterial vaginosis or yeast infection on vaginal exudate, order Vaginal smear for Bacterial vaginosis/yeast.

**CPT Codes:**
- 87205

**LOINC Codes:**
- 664-3
Growth Hormone
GH

ORDERING

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Sunday or Monday (day shift)

Methodology:
Chemiluminescent Immunoassay (Siemens Immulite 2000)

Reported:
1-8 days

Additional Information:
This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful.

Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine.

Well defined, normative values for stimulation testing are not available for this assay or other widely used growth hormone assays.

Historically, peak increases of < 7 µg/L in provocative testing have been considered as suggestive of deficiency and some authorities have also considered peak values < 10 micrograms/L to be supportive of the diagnosis in children with clinical criteria for GHD.

Glucose suppression testing: In a disorder suggesting excess GH secretion, draw blood before and during a glucose tolerance test to test for the ability of glucose administration to suppress GH levels. A nadir GH concentration of less than 1 microgram/L after oral administration of glucose has been the historical standard of a normal response, however, a lower nadir GH cut point at 0.4 microgram/L has been recommended to increase sensitivity of detecting modest GH hypersecretion when using contemporary GH assays (American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of acromegaly--2011 update. Katznelson L, Atkinson JL, Cook DM, Ezzat SZ, Hamrahian AH, Miller KK; American Association of Clinical Endocrinologists. Endocr Pract. 2011 Jul-Aug;17 Suppl 4:1-44).

This Siemens Immulite 2000 assay is standardized relative to the 2nd IS 98/574 reference preparation.


Synonyms:
- GH
- HGH
- Human growth hormone
- Somatotropin

COLLECTION

Patient Preparation:
Random Growth Hormone collection should be performed on fasting patients who have rested for at least 30 minutes prior to collection.

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**PROCESSING**

**Test Code:**
- GH

**Test Group:**
- GH

**Performing Lab:**
- China Basin Chemistry

**Specimen Preparation:**
- Freeze serum at -20°C.

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**RESULT INTERPRETATION**

**Units:**
- µg/L

**Reference Interval:**
- Adult males: < 3.1 µg/L
- Adult females: < 8.1 µg/L

Reference range was adopted from Siemens Immulite 2000 vendor performed studies and verified in-house by running adult donor samples (excluding autologous donors) on 20 male and 20 female samples.

Pediatric reference ranges are not available for this immunoassay platform.

For children, order Growth Hormone, Ultrasensitive (test code PGHB)

**Additional Information:**

This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful.

Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine.

Well defined, normative values for stimulation testing are not available for this assay or other widely used growth hormone assays.

Historically, peak increases of < 7 µg/L in provocative testing have been considered as suggestive of deficiency and some authorities have also considered peak values < 10 micrograms/L to be supportive of the diagnosis in children with clinical criteria for GHD.

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administration of glucose has been the historical standard of a normal response, however, a lower nadir GH cut point at 0.4 microgram/L has been recommended to increase sensitivity of detecting modest GH hypersecretion when using contemporary GH assays (American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of acromegaly--2011 update. Katznelson L, Atkinson JL, Cook DM, Ezzat SZ, Hamrahian AH, Miller KK; American Association of Clinical Endocrinologists. Endocr Pract. 2011 Jul-Aug;17 Suppl 4:1-44).

This Siemens Immulite 2000 assay is standardized relative to the 2nd IS 98/574 reference preparation.


**ADMINISTRATIVE**

CPT Codes:

83003

LOINC Codes:

2963-7

**COMPLETE VIEW**

Available Stat:

No

Test Code:

GH

Test Group:

GH

Performing Lab:

China Basin Chemistry

Performed:

Sunday or Monday (day shift)

Methodology:

Chemiluminescent Immunoassay (Siemens Immulite 2000)

Patient Preparation:

Random Growth Hormone collection should be performed on fasting patients who have rested for at least 30 minutes prior to collection.

Collect:

Gold top

Amount to Collect:

2 mL blood

Sample Type:

Serum

Preferred Volume:

1 mL serum

Minimum Volume:

0.2 mL serum

Specimen Preparation:

Freeze serum at -20C.

Units:

µg/L

Reference Interval:

Adult males: < 3.1 µg/L
Adult females: < 8.1 µg/L

Reference range was adopted from Siemens Immulite 2000 vendor performed studies and verified in-house by running adult donor samples (excluding autologous donors) on 20 male and 20 female samples.

Pediatric reference ranges are not available for this immunoassay platform.

For children, order Growth Hormone, Ultrasensitive (test code PGHB)

**Synonyms:**
- GH
- HGH
- Human growth hormone
- Somatotropin

**Reported:**
1-8 days

**Additional Information:**
This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful.

Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine.

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This Siemens Immulite 2000 assay is standardized relative to the 2nd IS 98/574 reference preparation.


**CPT Codes:**
- 83003

**LOINC Codes:**
- 2963-7
Growth Hormone, Pediatric
PGHB

ORDERING

Available Stat: No
Performing Lab: Esoterix
Methodology: RIA, Double antibody
Reported: Test performed Monday-Saturday. Turnaround time: 2-4 days
Additional Information: This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Growth Hormone" (test code GH). It requires approval if ordered in patients over the age of 20.

Reasons for testing (children and adults):
The assessment of GH secretory capacity is complicated because of the episodic nature of GH release from the pituitary. Basal GH levels can exhibit considerable variability throughout a 24 hour period, thus limiting their clinical utility. Alternatively, measurement of GH response to various stimuli has commonly been used to improve the diagnostic assessment of GH secretion. GH response to provocative stimuli among normal individuals, however is highly variable. Response values greater than 10 ng/mL have historically been considered to reflect normal GH secretory function, while values below 10 ng/mL have been considered to some degree of GH deficiency. However, it should be noted that this limit is arbitrarily derived. A significant percentage of normal controls exhibit response values well below this 10 ng/mL limit. The clinical research literature should be consulted for a more recent detailed review of the interpretation of GH response data.

Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful. Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine. Well defined, normative values for stimulation testing are not available for this assay or other widely used growth hormone assays.


Synonyms:
- GH
- GH, pediatric
- Growth Hormone ultrasensitive

COLLECTION

Sample Type: Serum
Collect:
Gold top, Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.4 mL serum

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: PGHB
Test Group: GH
Sendout: Yes
Performing Lab: Esoterix
Specimen Preparation: Separate serum within 1 hour after collection. Freeze at -20C. Ship frozen
Preferred Volume: 1 mL serum
Minimum Volume: 0.4 mL serum

RESULT INTERPRETATION

Units: ng/mL
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>1-2 days</th>
<th>2-7 days</th>
<th>31 days-11 months</th>
<th>Post-overnight fast</th>
<th>Children</th>
<th>&gt;= 18 year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-53 ng/mL</td>
<td>5-27 ng/mL</td>
<td>2-10 ng/mL</td>
<td></td>
<td>0-6 ng/mL</td>
<td>0-6 ng/mL</td>
<td></td>
</tr>
</tbody>
</table>

Additional Information: This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see “Growth Hormone” (test code GH). It requires approval if ordered in patients over the age of 20.

Reasons for testing (children and adults):

The assessment of GH secretory capacity is complicated because of the episodic nature of GH release from the pituitary. Basal GH levels can exhibit considerable variability throughout a 24 hour period, thus limiting their clinical utility. Alternatively, measurement of GH response to various stimuli has commonly been used to improve the diagnostic assessment of GH secretion. GH response to provocative stimuli among normal individuals, however, is highly variable. Response values greater than 10 ng/mL have historically been considered to reflect normal GH secretory function, while values below 10 ng/mL have been considered to some degree of GH deficiency. However, it should be noted that this limit is arbitrarily derived. A significant percentage of normal controls exhibit response values well below this 10 ng/mL limit. The clinical research literature should be consulted for a more recent detailed review of the interpretation of GH response data.

Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful. Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine. Well defined, normative values for stimulation testing are not available for this assay or other widely used growth hormone assays.


ADMINISTRATIVE

CPT Codes: 83003-90
LOINC Codes: 2963-7
Available Stat: No
Test Code: PGHB
Test Group: GH
Performing Lab: Esoterix
Sendout: Yes
Methodology: RIA, Double antibody
Collect: Gold top, Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.4 mL serum
Specimen Preparation: Separate serum within 1 hour after collection. Freeze at -20°C. Ship frozen
Units: ng/mL
Reference Interval:

<table>
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</tbody>
</table>

Synonyms:
- GH
- GH, pediatric
- Growth Hormone ultrasensitive

Reported: Test performed Monday-Saturday. Turnaround time: 2-4 days

Additional Information:

This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see “Growth Hormone” (test code GH). It requires approval if ordered in patients over the age of 20.

Reasons for testing (children and adults):

The assessment of GH secretory capacity is complicated because of the episodic nature of GH release from the pituitary. Basal GH levels can exhibit considerable variability throughout a 24 hour period, thus limiting their clinical utility. Alternatively, measurement of GH response to various stimuli has commonly been used to improve the diagnostic assessment of GH secretion. GH response to provocative stimuli among normal individuals, however, is highly variable. Response values greater than 10 ng/mL have historically been considered to reflect normal GH secretory function, while values below 10 ng/mL have been considered to some degree of GH deficiency. However, it should be noted that this limit is arbitrarily derived. A significant percentage of normal controls exhibit response values well below this 10 ng/mL limit. The clinical research literature should be consulted for a more recent detailed review of the interpretation of GH response data.
Because of wide fluctuations in normal levels, normal ranges are difficult to define and measuring random GH values is not usually diagnostically helpful. Screening tests for GH deficiency include measurements 1 hour after sleep or after 20 min of vigorous exercise, but definitive testing requires provocative testing. Increased levels are expected with insulin-induced hypoglycemia, arginine infusion, or the administration of L-dopa or clonidine. Well defined, normative values for stimulation testing are not available for this assay or other widely used growth hormone assays.


CPT Codes:
83003-90

LOINC Codes:
2963-7
H. PYLORI, UREA BREATH, adult
HPUBA

ORDERING

Performing Lab:
Quest
Methodology:
Infra-red Spectrophotometry (IR)
Reported:
3-5 days
Additional Information:
Helicobacter pylori is a gram-negative microaerophilic curved bacillus with an affinity for human gastric mucosa. H. pylori has been identified as an important pathogen in the upper GI tract. The casual relationship between H. pylori and chronic active gastritis, duodenal ulcers, and gastric ulcers has been well documented. BreathTek™ UBiT® for H. pylori is a non-invasive, non-radioactive method for detecting urease activity associated with H. pylori infection. It is FDA approved to confirm cure and offers 95.2% sensitivity and 89.7% specificity compared with endoscopic methods.
Synonyms:
- HELICOBACTER PYLORI, CAMPYLOBACTER PYLORIDIS, H PYLORI, GASTRITIS

COLLECTION

Patient Preparation:
Patient should fast one hour before collection of baseline breath sample. Pranactin®-Citric contains a small amount of aspartame sweetener. Test may not be suitable for patients with phenylketonuria whose dietary phenylalanine should be restricted
Collect:
BreathTek™ UBT Collection Kit
Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: Unacceptable
Frozen: Unacceptable
Rejection Criteria:
Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old

PROCESSING

Test Code:
HPUBA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Transport to CB ambient. Order Quest test code 14839.
Rejection Criteria:
Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old
Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: Unacceptable
Frozen: Unacceptable

RESULT INTERPRETATION

Additional Information:
Helicobacter pylori is a gram-negative microaerophilic curved bacillus with an affinity for human gastric mucosa. H. pylori has been
identified as an important pathogen in the upper GI tract. The casual relationship between H. pylori and chronic active gastritis, duodenal ulcers, and gastric ulcers has been well documented. BreathTek™ UBIT® for H. pylori is a non-invasive, non-radioactive method for detecting urease activity associated with H. pylori infection. It is FDA approved to confirm cure and offers 95.2% sensitivity and 89.7% specificity compared with endoscopic methods.

**CPT Codes:**
- 83013-90

**LOINC Codes:**
- 29891-9

**COMPLETE VIEW**

**Test Code:**
- HPUBA

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Infra-red Spectrophotometry (IR)

**Patient Preparation:**
- Patient should fast one hour before collection of baseline breath sample. Pranactin®-Citric contains a small amount of aspartame sweetener. Test may not be suitable for patients with phenylketonuria whose dietary phenylalanine should be restricted

**Collect:**
- BreathTek™ UBT Collection Kit

**Rejection Criteria:**
- Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old

**Specimen Preparation:**
- Transport to CB ambient. Order Quest test code 14839.

**Synonyms:**
- HELICOBACTER PYLORI, CAMPYLOBACTER PYLORIDIS, H PYLORI, GASTRITIS

**Stability (from collection to initiation):**
- Room temperature: 7 days
- Refrigerated: Unacceptable
- Frozen: Unacceptable

**Reported:**
- 3-5 days

**Additional Information:**
- Helicobacter pylori is a gram-negative microaerophilic curved bacillus with an affinity for human gastric mucosa. H. pylori has been identified as an important pathogen in the upper GI tract. The casual relationship between H. pylori and chronic active gastritis, duodenal ulcers, and gastric ulcers has been well documented. BreathTek™ UBIT® for H. pylori is a non-invasive, non-radioactive method for detecting urease activity associated with H. pylori infection. It is FDA approved to confirm cure and offers 95.2% sensitivity and 89.7% specificity compared with endoscopic methods.

**CPT Codes:**
- 83013-90

**LOINC Codes:**
- 29891-9
Haemophilus influenzae Type B, IgG antibody
HIBG

ORDERING

Performing Lab:
Quest
Methodology:
EIA
Reported:
2 - 4 days
Additional Information:
Haemophilus influenzae is a gram-negative bacteria that is present in approximately three-quarters of children and adults. In infants and young children, haemophilus influenzae, especially type B, may cause bacteremias and meningitis. In children and older individuals haemophilus influenzae may cause respiratory tract infections.
Synonyms:
- H. flu
- HIB antibody
- HIB titer

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month
Unacceptable Conditions:
Gossly heomlyzed, lipemic or icteric samples.
Rejection Criteria:
Gossly heomlyzed, lipemic or icteric samples.

PROCESSING

Test Code:
HIBG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze serum. Transport to China Basin frozen. Order Quest test code 35135
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
**Unacceptable Conditions:**
- Gossly heomlyzed, lipemic or icteric samples.

**Rejection Criteria:**
- Gossly heomlyzed, lipemic or icteric samples.

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

**RESULT INTERPRETATION**

**Units:**
- µg/mL (mcg/mL)

**Additional Information:**
- Haemophilus influenzae is a gram-negative bacteria that is present in approximately three-quarters of children and adults. In infants and young children, haemophilus influenzae, especially type B, may cause bacteremias and meningitis. In children and older individuals haemophilus influenzae may cause respiratory tract infections.

**ADMINISTRATIVE**

**CPT Codes:**
- 86684-90

**LOINC Codes:**
- 11257-3

**COMPLETE VIEW**

**Test Code:**
- HIBG

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- EIA

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Rejection Criteria:**
- Gossly heomlyzed, lipemic or icteric samples.

**Unacceptable Conditions:**
- Gossly heomlyzed, lipemic or icteric samples.

**Specimen Preparation:**
- Aliquot and freeze serum. Transport to China Basin frozen. Order Quest test code 35135

**Units:**
- µg/mL (mcg/mL)

**Synonyms:**
- H. flu
- HIB antibody
- HIB titer

**Stability (from collection to initiation):**

Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

**Reported:**

2 - 4 days

**Additional Information:**

Haemophilus influenzae is a gram-negative bacteria that is present in approximately three-quarters of children and adults. In infants and young children, haemophilus influenzae, especially type B, may cause bacteremias and meningitis. In children and older individuals haemophilus influenzae may cause respiratory tract infections.

**CPT Codes:**

86684-90

**LOINC Codes:**

11257-3
Haloperidol
HALO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC-MS
Reported:
Test performed Tuesday-Friday. Turnaround time: 2-6 days.
Synonyms:
● Haldol

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
8 mL blood
Preferred Volume:
4 mL serum
Minimum Volume:
2.1 mL serum
Remarks:
Collect the sample 11-17 hours after last dose. Write time of collection on requisition.

PROCESSING

Test Code:
HALO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 564
Preferred Volume:
4 mL serum
Minimum Volume:
2.1 mL serum

RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
Therapeutic: 5-15 ug/L
Toxic: > 50 ug/L
CPT Codes:
80173-90
LOINC Codes:
3669-9

Available Stat:
No
Test Code:
HALO
Performing Lab:
Quest
Sendout:
Yes
Methodology:
LC-MS
Remarks:
Collect the sample 11-17 hours after last dose. Write time of collection on requisition.
Collect:
Red top
Amount to Collect:
8 mL blood
Sample Type:
Serum
Preferred Volume:
4 mL serum
Minimum Volume:
2.1 mL serum
Specimen Preparation:
Refrigerate. Order Quest # 564
Units:
µg/L (mcg/L)
Reference Interval:
Therapeutic: 5-15 µg/L
Toxic: > 50 µg/L
Synonyms:
• Haldol
Reported:
Test performed Tuesday-Friday. Turnaround time: 2-6 days.
CPT Codes:
80173-90
LOINC Codes:
3669-9
Hantavirus Antibodies (IgG & IgM)

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: ELISA
Reported: Set up 6 days a week. Turnaround 2-4 days

Additional Information:
Two major groups of hantaviruses are recognized based on clinical presentation. The first group includes Sin Nombre Virus (SNV), which causes hantavirus pulmonary syndrome, a severe and sometimes fatal form of acute respiratory distress. A second group of hantaviruses (including Seoul, Hantaan, Dobrava, and Puumala) causes hemorrhagic fever with renal syndrome, a condition not typically seen in the United States.

Sera are initially screened for IgG and IgM antibodies recognizing the nucleocapsid protein common to all hantaviruses. All screen IgM positive samples are then tested for SNV-specific IgM; any screen IgM positive samples that are also screen IgG positive are tested for SNV-specific IgG, as well as SNV-specific IgM. Samples that are screen IgG positive but screen IgM negative are not subjected to SNV-specific IgG testing, since the lack of IgM rules out acute SNV infection. A positive screening result but a negative SNV-specific antibody result may indicate either reactivity to a hantavirus other than SNV or false positive reactivity. A small number of SNV IgM positive (but screen IgG negative) samples represent false positive reactivity associated with acute cytomegalovirus or Epstein Barr virus infection.

These assays were developed and their performance characteristics have been determined by Focus Diagnostics. They have not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

Reflex Testing:
If Hantavirus IgG is > 1.10 and Hantavirus IgM is >1.10 then Sin Nombre Virus IgG Confirmation will be performed at an additional charge by the reference lab.

Synonyms:
- Sin nombre antibodies

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top acceptable)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum

PROCESSING

Test Code: HANTA
Test Group: Hantavirus
Sendout: Yes
Performing Lab:
Focus via Quest

Specimen Preparation:
Refrigerate sample at 4C. Order Quest #37547X

Preferred Volume:
1 mL serum

Minimum Volume:
0.25 mL serum

RESULT INTERPRETATION

Units:
Index

Reference Interval:
<= 1.10: Antibody not detected
> 1.10: Antibody detected

Additional Information:
Two major groups of hantaviruses are recognized based on clinical presentation. The first group includes Sin Nombre Virus (SNV), which causes hantavirus pulmonary syndrome, a severe and sometimes fatal form of acute respiratory distress. A second group of hantaviruses (including Seoul, Hantaan, Dobrava, and Puumala) causes hemorrhagic fever with renal syndrome, a condition not typically seen in the United States.

Sera are initially screened for IgG and IgM antibodies recognizing the nucleocapsid protein common to all hantaviruses. All screen IgM positive samples are then tested for SNV-specific IgM; any screen IgM positive samples that are also screen IgG positive are tested for SNV-specific IgG, as well as SNV-specific IgM. Samples that are screen IgG positive but screen IgM negative are not subjected to SNV-specific IgG testing, since the lack of IgM rules out acute SNV infection. A positive screening result but a negative SNV-specific antibody result may indicate either reactivity to a hantavirus other than SNV or false positive reactivity. A small number of SNV IgM positive (but screen IgG negative) samples represent false positive reactivity associated with acute cytomegalovirus or Epstein Barr virus infection.

These assays were developed and their performance characteristics have been determined by Focus Diagnostics. They have not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

ADMINISTRATIVE

CPT Codes:
86790-90 x2

LOINC Codes:
16928-4

COMPLETE VIEW

Available Stat:
No

Test Code:
HANTA

Test Group:
Hantavirus

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
ELISA

Collect:
Red top (Gold top acceptable)

Amount to Collect:
Sample Type: Serum

Preferred Volume: 1 mL serum

Minimum Volume: 0.25 mL serum

Specimen Preparation:
Refrigerate sample at 4C. Order Quest #37547X

Units: Index

Reference Interval:
<= 1.10: Antibody not detected
> 1.10: Antibody detected

Synonyms:
● Sin nombre antibodies

Reported:
Set up 6 days a week. Turnaround 2-4 days

Reflex Testing:
If Hantavirus IgG is > 1.10 and Hantavirus IgM is >1.10 then Sin Nombre Virus IgG Confirmation will be performed at an additional charge by the reference lab.

Additional Information:
Two major groups of hantaviruses are recognized based on clinical presentation. The first group includes Sin Nombre Virus (SNV), which causes hantavirus pulmonary syndrome, a severe and sometimes fatal form of acute respiratory distress. A second group of hantaviruses (including Seoul, Hantaan, Dobrava, and Puumala) causes hemorrhagic fever with renal syndrome, a condition not typically seen in the United States.

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These assays were developed and their performance characteristics have been determined by Focus Diagnostics. They have not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

CPT Codes:
86790-90 x2

LOINC Codes:
16928-4
Hantavirus, Antigen
MOLT

ORDERING

Approval Required:
May be performed after consultation with State Viral and Rickettsial Disease Laboratory.

Available Stat:
No

Performing Lab:
State Viral & Rickettsial Disease Laboratory

Methodology:
FA, EIA

Additional Information:
Seldom needed due to specificity of serology.

COLLECTION

Sample Type:
Serum, Unfixed tissue

Collect:
Gold top

Amount to Collect:
10 mL blood

Preferred Volume:
5 mL serum

Minimum Volume:
1 mL serum

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Hantavirus

Sendout:
Yes

Performing Lab:
State Viral & Rickettsial Disease Laboratory

Specimen Preparation:
Refrigerate sample

Preferred Volume:
5 mL serum

Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Seldom needed due to specificity of serology.
Approval Required:
May be performed after consultation with State Viral and Rickettsial Disease Laboratory.

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Hantavirus

Performing Lab:
State Viral & Rickettsial Disease Laboratory

Sendout:
Yes

Methodology:
FA, EIA

Collect:
Gold top

Amount to Collect:
10 mL blood

Sample Type:
Serum, Unfixed tissue

Preferred Volume:
5 mL serum

Minimum Volume:
1 mL serum

Specimen Preparation:
Refrigerate sample

Reference Interval:
Negative

Additional Information:
Seldom needed due to specificity of serology.
Haptoglobin
HAPT

ORDERING

Ordering Recommendations:
Should only be ordered in anemic patients when peripheral smear review, reticulocyte counts, and Coombs testing have failed to elucidate the cause.

Available Stat:
No

Performing Lab:
Immunology

Performed:
Monday, Wednesday, Friday (day shift)

Methodology:
Rate nephelometry

Reported:
2-5 days

Additional Information:
Haptoglobin is a serum protein that binds hemoglobin irreversibly. This protein functions to transport intravascular free hemoglobin to its degradation site in the reticulo-endothelial system. Haptoglobin normally is expected to decrease during active hemolysis; however, haptoglobin is an acute phase reactant, thus normal or elevated levels do not exclude the presence of hemolysis. Further, some individuals may normally have very low levels of haptoglobin at baseline and therefore testing in these individuals may result in a false impression of hemolysis. For the test to be reliably interpreted, it is best to compare a result with the patient's baseline level.

Further, haptoglobin does not provide information as to the cause of the hemolysis and therefore rarely results in changes in therapy. In patients with suspected hemolysis, the suspicion is more easily strengthened by determining LDH and bilirubin levels. If these are elevated, then determining a reticulocyte count as a confirmatory test and examining the patient's peripheral smear for red cell features that may offer information as to the cause of the hemolysis would be appropriate.

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed, lipemic or icteric samples

PROCESSING

Test Code:
HAPT

Performing Lab:
Immunology

Specimen Preparation:
Refrigerate serum.

Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed, lipemic or icteric samples

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
36-195 mg/dL

Additional Information:
Haptoglobin is a serum protein that binds hemoglobin irreversibly. This protein functions to transport intravascular free hemoglobin to its degradation site in the reticulo-endothelial system. Haptoglobin normally is expected to decrease during active hemolysis; however, haptoglobin is an acute phase reactant, thus normal or elevated levels do not exclude the presence of hemolysis. Further, some individuals may normally have very low levels of haptoglobin at baseline and therefore testing in these individuals may result in a false impression of hemolysis. For the test to be reliably interpreted, it is best to compare a result with the patient's baseline level.

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ADMINISTRATIVE

CPT Codes:
83010

LOINC Codes:
4542-7

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Should only be ordered in anemic patients when peripheral smear review, reticulocyte counts, and Coombs testing have failed to elucidate the cause.

Test Code:
HAPT

Performing Lab:
Immunology

Performed:
Monday, Wednesday, Friday (day shift)

Methodology:
Rate nephelometry

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed, lipemic or icteric samples

**Specimen Preparation:**
Refrigerate serum.

**Units:**
mg/dL

**Reference Interval:**
36-195 mg/dL

**Reported:**
2-5 days

**Additional Information:**
Haptoglobin is a serum protein that binds hemoglobin irreversibly. This protein functions to transport intravascular free hemoglobin to its degradation site in the reticulo-endothelial system. Haptoglobin normally is expected to decrease during active hemolysis; however, haptoglobin is an acute phase reactant, thus normal or elevated levels do not exclude the presence of hemolysis. Further, some individuals may normally have very low levels of haptoglobin at baseline and therefore testing in these individuals may result in a false impression of hemolysis. For the test to be reliably interpreted, it is best to compare a result with the patient's baseline level.

Further, haptoglobin does not provide information as to the cause of the hemolysis and therefore rarely results in changes in therapy. In patients with suspected hemolysis, the suspicion is more easily strengthened by determining LDH and bilirubin levels. If these are elevated, then determining a reticulocyte count as a confirmatory test and examining the patient's peripheral smear for red cell features that may offer information as to the cause of the hemolysis would be appropriate.

**CPT Codes:**
83010

**LOINC Codes:**
4542-7
Hazelnut Component Panel
HCOMP

ORDERING

Performing Lab:
Quest
Performed:
Tuesday-Saturday
Methodology:
Immunoassay
Reported:
1-3 days
Synonyms:
- Hazelnut Component IgE

COLLECTION

Sample Type:
Serum
Collect:
Gold or red-top
Amount to Collect:
2.0 mL blood
Preferred Volume:
1.0 mL serum
Minimum Volume:
0.6 mL serum
Stability (from collection to initiation):
Room Temperature and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature:
Frozen

PROCESSING

Test Code:
HCOMP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94476.
Preferred Volume:
1.0 mL serum
Minimum Volume:
0.6 mL serum
Stability (from collection to initiation):
Room Temperature and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature:
Frozen
RESULT INTERPRETATION

Units:

kU/L

Reference Interval:

<0.10

ADMINISTRATIVE

CPT Codes:

86008X4

LOINC Codes:

69421-6, 58753-5, 65765-0, 81788-2

COMPLETE VIEW

Test Code:

HCOMP

Performing Lab:

Quest

Sendout:

Yes

Performed:

Tuesday-Saturday

Methodology:

Immunoassay

Collect:

Gold or red-top

Amount to Collect:

2.0 mL blood

Sample Type:

Serum

Preferred Volume:

1.0 mL serum

Minimum Volume:

0.6 mL serum

Specimen Preparation:

Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94476.

Units:

kU/L

Reference Interval:

<0.10

Synonyms:

• Hazelnut Component IgE

Storage/Transport Temperature:

Frozen

Stability (from collection to initiation):

Room Temperature and Refrigerated: 14 days

Frozen: 30 days

Reported:

1-3 days

CPT Codes:

86008X4

LOINC Codes:
HCV & HIV NAT
NAT

ORDERING

Available Stat:
No
Performing Lab:
Creative Testing Solutions
Methodology:
Transcription mediated Amplification
Reported:
Test set up Monday through Saturday p.m. Turnaround time: 2-4 days
Additional Information:
Testing for stem cell and organ donors is performed on individual samples (non-pooled). This is per current FDA regulations. The assay detects HIV & HCV RNA simultaneously and if the screen is reactive HIV & HCV RNA is tested for separately. Results are qualitative as Non-reactive or Reactive. The test can only be ordered as part of the package PTXID.
Synonyms:
- nucleic acid testing
- Hepatitis C
- Human immunodeficiency virus

COLLECTION

Sample Type:
EDTA Plasma
Collect:
6 mL Lavender top x 2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL plasma
Minimum Volume:
5 mL plasma
Remarks:
These tests are ordered as part of the Pre-Transplant Infectious Disease (PTXID) screen and cannot be ordered separately.
DO NOT draw samples for NAT send out on weekends and holidays or after 2 PM on Fridays.

PROCESSING

Test Code:
NAT
Test Group:
Hepatitis
Sendout:
Yes
Performing Lab:
Creative Testing Solutions
Specimen Preparation:
Ordered as part of the PTXID package. Samples must be received by BSL within 72 hours of collection. Keep at room temperature, DO NOT refrigerate or centrifuge sample.

NAT (HCV/HIV) and WNV NAT can be performed on a single 6 mL lavender top tube.
Preferred Volume:
6 mL plasma

Minimum Volume:
5 mL plasma

RESULT INTERPRETATION

Reference Interval:
Nonreactive

Additional Information:
Testing for stem cell and organ donors is performed on individual samples (non-pooled). This is per current FDA regulations. The assay detects HIV & HCV RNA simultaneously and if the screen is reactive HIV & HCV RNA is tested for separately. Results are qualitative as Non-reactive or Reactive. The test can only be ordered as part of the package PTXID.

ADMINISTRATIVE

LOINC Codes:
53825-6

COMPLETE VIEW

Available Stat:
No

Test Code:
NAT

Test Group:
Hepatitis

Performing Lab:
Creative Testing Solutions

Sendout:
Yes

Methodology:
Transcription mediated Amplification

Remarks:
These tests are ordered as part of the Pre-Transplant Infectious Disease (PTXID) screen and cannot be ordered separately.

DO NOT draw samples for NAT send out on weekends and holidays or after 2 PM on Fridays.

Collect:
6 mL Lavender top x 2

Amount to Collect:
12 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
6 mL plasma

Minimum Volume:
5 mL plasma

Specimen Preparation:
Ordered as part of the PTXID package. Samples must be received by BSL within 72 hours of collection. Keep at room temperature, DO NOT refrigerate or centrifuge sample.

NAT (HCV/HIV) and WNV NAT can be performed on a single 6 mL lavender top tube.

Reference Interval:
Nonreactive

Synonyms:
- nucleic acid testing
- Hepatitis C
- Human immunodeficiency virus

**Reported:**
Test set up Monday through Saturday p.m. Turnaround time: 2-4 days

**Additional Information:**
Testing for stem cell and organ donors is performed on individual samples (non-pooled). This is per current FDA regulations. The assay detects HIV & HCV RNA simultaneously and if the screen is reactive HIV & HCV RNA is tested for separately. Results are qualitative as Non-reactive or Reactive. The test can only be ordered as part of the package PTXID.

**LOINC Codes:**
53825-6
Heart-Reactive Antibody
MOLT

ORDERING

Available Stat:
No
Additional Information:
Research procedure only. Cannot be charged to a patient account. Please supply a budget number. Sent to: Dr. J. Zabriskie The Rockefeller University, 230 York Avenue, New York, NY 10021 (212)360-1125 or -1555
Synonyms:
- anti-heart antibody

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Specimen Preparation:
Refrigerate sample
Preferred Volume:
2 mL serum

RESULT INTERPRETATION

Additional Information:
Research procedure only. Cannot be charged to a patient account. Please supply a budget number. Sent to: Dr. J. Zabriskie The Rockefeller University, 230 York Avenue, New York, NY 10021 (212)360-1125 or -1555

COMPLETE VIEW

Available Stat:
No
Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Collect:
Gold top
Amount to Collect:
4 mL blood
Sample Type:
Serum

**Preferred Volume:**
2 mL serum

**Specimen Preparation:**
Refrigerate sample

**Synonyms:**
- anti-heart antibody

**Additional Information:**
Research procedure only. Cannot be charged to a patient account. Please supply a budget number. Sent to: Dr. J. Zabriskie The Rockefeller University, 230 York Avenue, New York, NY 10021 (212)360-1125 or -1555)
Heat Shock Protein Antibody
MOLT

ORDERING

Available Stat:
No
Performing Lab:
CO via Quest
Methodology:
Western Blot
Additional Information:
This test, which has been used in the diagnosis of hearing loss, is not offered by the UCSF Clinical Laboratories due to the poor sensitivity of this assay.


Synonyms:
- anti-68 KD antibodies
- HSP-70
- anti-HSP

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
CO via Quest
Specimen Preparation:
Refrigerate serum, send in plastic tube, order #11918. This test is referred by Quest to IMMCO, Buffalo, NY
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum

RESULT INTERPRETATION
**Reference Interval:**
Not present

**Additional Information:**
This test, which has been used in the diagnosis of hearing loss, is not offered by the UCSF Clinical Laboratories due to the poor sensitivity of this assay.


## COMPLETE VIEW

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<thead>
<tr>
<th>Available Stat:</th>
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<td><strong>Test Code:</strong></td>
<td>MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)</td>
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<tr>
<td><strong>Performing Lab:</strong></td>
<td>CO via Quest</td>
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<td><strong>Sendout:</strong></td>
<td>Yes</td>
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<td><strong>Methodology:</strong></td>
<td>Western Blot</td>
</tr>
<tr>
<td><strong>Collect:</strong></td>
<td>Gold top</td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
<td>4 mL blood</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>2 mL serum</td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
<td>1 mL serum</td>
</tr>
<tr>
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</tr>
<tr>
<td><strong>Reference Interval:</strong></td>
<td>Not present</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>anti-68 KD antibodies, HSP-70, anti-HSP</td>
</tr>
</tbody>
</table>

**Additional Information:**
This test, which has been used in the diagnosis of hearing loss, is not offered by the UCSF Clinical Laboratories due to the poor sensitivity of this assay.

Helicobacter pylori Antigen
HPAG

ORDERING

Available Stat:
No
Performing Lab:
UC Irvine
Methodology:
EIA
Reported:
Performed once per week. Results available in 3-10 days.

Additional Information:
Detection of antigen in the stool is reported to be as sensitive as the urea breath test for the presence of Helicobacter-associated gastritis and nearly as sensitive as PCR (the clinical relevance of the latter is unclear). The presence of antigen cannot be used as a test of cure, as stools remain positive due to persistence of antigen from presumably unviable organisms one month after treatment is initiated in nearly 20% of patients (and in 40% of patients by PCR).

Synonyms:
- Campylobacter pyloridis
- H pylori
- gastritis

COLLECTION

Patient Preparation:
No prior treatment with antibacterial antibiotics, proton-pump inhibitors or bismuth preparation use for two weeks before samples collection.

Sample Type:
Unpreserved Stool

Collect:
Urine cup or other leakproof container

Amount to Collect:
1 gm stool

Preferred Volume:
1 gm

Minimum Volume:
0.5 gm

Remarks:
Collect specimens Saturday-Thursday only. Deliver immediately to laboratory. Refrigerate sample if transport is delayed > 1 hour.

Stability (from collection to initiation):
Room temperature 1 hour, refrigerated 3 days, frozen 1 month.

Unacceptable Conditions:
Watery stools, swabs or specimens in transport media. Samples collected outside of stated time frames.

PROCESSING

Test Code:
HPAG
Test Group:
H pylori
Sendout:
Yes
Performing Lab:
Specimen Preparation:
Freeze sample at -20C and transport frozen. Orcer UCI test code SERHPA

Preferred Volume:
1 gm

Minimum Volume:
0.5 gm

Unacceptable Conditions:
Watery stools, swabs or specimens in transport media. Samples collected outside of stated time frames.

Stability (from collection to initiation):
Room temperature 1 hour, refrigerated 3 days, frozen 1 month.

RESULT INTERPRETATION

Reference Interval:
Not detected

Additional Information:
Detection of antigen in the stool is reported to be as sensitive as the urea breath test for the presence of Helicobacter-associated gastritis and nearly as sensitive as PCR (the clinical relevance of the latter is unclear). The presence of antigen cannot be used as a test of cure, as stools remain positive due to persistence of antigen from presumably unviable organisms one month after treatment is initiated in nearly 20% of patients (and in 40% of patients by PCR).

ADMINISTRATIVE

CPT Codes:
87338- 90

LOINC Codes:
17780-8

COMPLETE VIEW

Available Stat:
No

Test Code:
HPAG

Test Group:
H pylori

Performing Lab:
UC Irvine

Sendout:
Yes

Methodology:
EIA

Patient Preparation:
No prior treatment with antibacterial antibiotics, proton-pump inhibitors or bismuth preparation use for two weeks before samples collection.

Remarks:
Collect specimens Saturday-Thursday only. Deliver immediately to laboratory. Refrigerate sample if transport is delayed > 1 hour.

Collect:
Urine cup or other leakproof container

Amount to Collect:
1 gm stool

Sample Type:
Unpreserved Stool

Preferred Volume:
1 gm
Minimum Volume:

0.5 gm

Unacceptable Conditions:

Watery stools, swabs or specimens in transport media. Samples collected outside of stated time frames.

Specimen Preparation:

Freeze sample at -20C and transport frozen. Orce UCI test code SERHPA

Reference Interval:

Not detected

Synonyms:

- Campylobacter pyloridis
- H pylori
- gastritis

Stability (from collection to initiation):

Room temperature 1 hour, refrigerated 3 days, frozen 1 month.

Reported:

Performed once per week. Results available in 3-10 days.

Additional Information:

Detection of antigen in the stool is reported to be as sensitive as the urea breath test for the presence of Helicobacter-associated gastritis and nearly as sensitive as PCR (the clinical relevance of the latter is unclear). The presence of antigen cannot be used as a test of cure, as stools remain positive due to persistence of antigen from presumably unviable organisms one month after treatment is initiated in nearly 20% of patients (and in 40% of patients by PCR).

CPT Codes:

87338- 90

LOINC Codes:

17780-8
Helicobacter pylori Breath test, Pediatric
HPUBP

ORDERING

Available Stat:  
No
Performing Lab:  
Quest
Methodology:  
Infrared spectrophotometry
Reported:  
3-5 days
Synonyms:  
- Campylobacter pyloridis
- H pylori
- gastritis

COLLECTION

Patient Preparation:  
Patient should fast one hour before collection of baseline breath sample. Pranactin®-Citric contains a small amount of aspartame sweetener. Test may not be suitable for patients with phenylketonuria whose dietary phenylalanine should be restricted
Collect:  
BreathTek™ UBT Collection Kit
Remarks:  
Human breath from patients 3-17 years of age: Paired breath samples (pre and post) collected in BreathTek™ UBT Collection Kit bags and must be submitted together. Follow instructions provided with kit
For patients 3-17 years of age: Gender, height, weight, and age, must be provided on the pediatric UHR card included in the BreathTek™ UBT Collection Kit.
Stability (from collection to initiation):  
Room temperature 1 week
Unacceptable Conditions:  
Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old
Rejection Criteria:  
Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old

PROCESSING

Test Code:  
HPUBP
Test Group:  
H pylori
Sendout:  
Yes
Performing Lab:  
Quest
Specimen Preparation:  
Forward samples to CB ambient. Paired breath samples (pre and post) collected in BreathTek™ UBT Collection Kit bags and must be submitted together. Order Quest test code 92491.
Unacceptable Conditions:  
Specimen types other than BreathTek™ UBT bags Specimens from patients <3 years old
Rejection Criteria:  
Test information subject to change
Specimen types other than BreathTek™ UBT bags
Specimens from patients <3 years old

**Stability (from collection to initiation):**
Room temperature 1 week

### RESULT INTERPRETATION

**Reference Interval:**
Not detected

### ADMINISTRATIVE

**CPT Codes:**
83013-90

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
HPUBP

**Test Group:**
H pylori

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Infrared spectrophotometry

**Patient Preparation:**
Patient should fast one hour before collection of baseline breath sample. Pranactin®-Citric contains a small amount of aspartame sweetener. Test may not be suitable for patients with phenylketonuria whose dietary phenylalanine should be restricted.

**Remarks:**
Human breath from patients 3-17 years of age: Paired breath samples (pre and post) collected in BreathTek™ UBT Collection Kit bags and must be submitted together. Follow instructions provided with kit.

For patients 3-17 years of age: Gender, height, weight, and age, must be provided on the pediatric UHR card included in the BreathTek™ UBT Collection Kit.

**Collect:**
BreathTek™ UBT Collection Kit

**Rejection Criteria:**
Specimen types other than BreathTek™ UBT bags
Specimens from patients <3 years old

**Unacceptable Conditions:**
Specimen types other than BreathTek™ UBT bags
Specimens from patients <3 years old

**Specimen Preparation:**
Forward samples to CB ambient. Paired breath samples (pre and post) collected in BreathTek™ UBT Collection Kit bags and must be submitted together. Order Quest test code 92491.

**Reference Interval:**
Not detected

**Synonyms:**
- Campylobacter pyloridis
- H pylori
- Gastritis

**Stability (from collection to initiation):**
Room temperature 1 week

**Reported:**
3-5 days

CPT Codes:
83013-90
Helicobacter pylori Culture
P131

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Culture
Reported:
8-14 days
Reflex Testing:
If Helicobacter pylori is isolated, susceptibility will be performed at an additional charge.
Synonyms:
- Bacterial culture
- Campylobacter pyloridis
- H pylori
- gastritis

COLLECTION

Sample Type:
Gastric biopsy
Collect:
Tryptic Soy Broth with 15% glycerol vial (obtain from Microbiology prior to sample collection)
Amount to Collect:
3 mm
Preferred Volume:
3 mm
Minimum Volume:
1 mm
Remarks:
Collect Monday - Thursday only. Place gastric biopsy into Tryptic Soy Broth with 15% glycerol vial at time of collection. Obtain vials from the microbiology lab.
Stability (from collection to initiation):
Refrigerated: 48 hours (TSB with glycerol broth only)
Rejection Criteria:
- Improperly collected sample
- Sample received Friday - Sunday

PROCESSING

Test Code:
P131
Test Group:
H pylori
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample in Tryptic Soy Broth with 15% glycerol vial. Quest Diagnostics Infectious Disease test code 91245 Helicobacter pylori Culture with Reflex to Susceptibility

Preferred Volume:
3 mm

Minimum Volume:
1 mm

Rejection Criteria:
Improperly collected sample

Sample received Friday - Sunday

Stability (from collection to initiation):
Refrigerated: 48 hours (TSB with glycerol broth only)

RESULT INTERPRETATION

Reference Interval:
Not isolated

ADMINISTRATIVE

CPT Codes:
87081, 87205

LOINC Codes:
664-3, 587-6

COMPLETE VIEW

Available Stat:
No

Test Code:
P131

Test Group:
H pylori

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Culture

Remarks:
Collect Monday - Thursday only. Place gastric biopsy into Tryptic Soy Broth with 15% glycerol vial at time of collection. Obtain vials from the microbiology lab.

Collect:
Tryptic Soy Broth with 15% glycerol vial (obtain from Microbiology prior to sample collection)

Amount to Collect:
3 mm

Sample Type:
Gastric biopsy

Preferred Volume:
3 mm

Minimum Volume:
1 mm

Rejection Criteria:
Improperly collected sample
Sample received Friday - Sunday

**Specimen Preparation:**
Refrigerate sample in Tryptic Soy Broth with 15% glycerol vial. Quest Diagnostics Infectious Disease test code 91245 Helicobacter pylori Culture with Reflex to Susceptibility

**Reference Interval:**
Not isolated

**Synonyms:**
- Bacterial culture
- Campylobacter pyloridis
- H pylori
- gastritis

**Stability (from collection to initiation):**
Refrigerated: 48 hours (TSB with glycerol broth only)

**Reported:**
8-14 days

**Reflex Testing:**
If Helicobacter pylori is isolated, susceptibility will be performed at an additional charge.

**CPT Codes:**
87081, 87205

**LOINC Codes:**
664-3, 587-6
Helicobacter pylori IgG Antibody

**ORDERING**

Available Stat: No
Performing Lab: Immunology
Performed: Wednesday (day shift)
Methodology: EIA
Reported: 1-8 days

**Additional Information:**
This is a qualitative test; no quantitative interpretation should be placed upon the height of the antibody response. Unlike elevated IgA or IgM titers which may represent past infection, elevated levels of IgG antibody correlate with a positive gastric culture. However, a positive result may also be found in healthy, asymptomatic individuals, and the serologic test is most useful when the result is negative, which suggests little likelihood of infection.

**Synonyms:**
- Campylobacter pyloridis
- H pylori
- gastritis

**COLLECTION**

Sample Type: Serum
Collect: Gold top
Amount to Collect: 3 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

**PROCESSING**

Test Code: HELI
Test Group: H pylori
Performing Lab: Immunology
Specimen Preparation:
Freeze serum at -20C.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
RESULT INTERPRETATION

Units:
Units
Reference Interval:
Negative: < 20.1 Units
Equivocal: 20.1-24.9 Units
Positive: > 24.9 Units
Additional Information:
This is a qualitative test; no quantitative interpretation should be placed upon the height of the antibody response. Unlike elevated IgA or IgM titers which may represent past infection, elevated levels of IgG antibody correlate with a positive gastric culture. However, a positive result may also be found in healthy, asymptomatic individuals, and the serologic test is most useful when the result is negative, which suggests little likelihood of infection.

ADMINISTRATIVE

CPT Codes:
86677
LOINC Codes:
5176-3

COMPLETE VIEW

Available Stat:
No
Test Code:
HELI
Test Group:
H pylori
Performing Lab:
Immunology
Performed:
Wednesday (day shift)
Methodology:
EIA
Collect:
Gold top
Amount to Collect:
3 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Specimen Preparation:
Freeze serum at -20C.
Units:
Units
Reference Interval:
Negative: < 20.1 Units
Equivocal: 20.1-24.9 Units
Positive: > 24.9 Units
Synonyms:
• Campylobacter pyloridis
• H pylori
• gastritis

Reported:
1-8 days

Additional Information:
This is a qualitative test; no quantitative interpretation should be placed upon the height of the antibody response. Unlike elevated IgA or IgM titers which may represent past infection, elevated levels of IgG antibody correlate with a positive gastric culture. However, a positive result may also be found in healthy, asymptomatic individuals, and the serologic test is most useful when the result is negative, which suggests little likelihood of infection.

CPT Codes:
86677

LOINC Codes:
5176-3
Helper, Suppresser and Total T cells
THID

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Immunology

**Performed:**
Monday-Saturday (day shift)

**Methodology:**
Flow cytometry

**Reported:**
2-3 days

**Additional Information:**
Both CD3 (total % T cells), CD3/CD4 (% Helper-Inducer T cells) and CD3/CD8 (% Suppressor-Cytotoxic T cells) are reported as well as the CD4/CD8 ratio.

Absolute cell counts require a CBC w/Differential on the same sample, which is ordered and charged separately if not otherwise available.

**Note:** In a legal opinion given to the Medical Center, attempting to circumvent a patient's refusal of HIV testing by using CD4 in its place is an (illegal) invasion of the patient's privacy unless a consent for HIV Testing is obtained.

CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**Synonyms:**
- CD4
- CD8
- CD3
- Inducer
- Cytotoxic
- T cells
- CD4/CD8
- flow cytometry

**COLLECTION**

**Sample Type:**
EDTA whole blood

**Collect:**
Lavender top

**Amount to Collect:**
3 mL blood

**Preferred Volume:**
3 mL blood

**Remarks:**
Keep sample at room temperature

**Unacceptable Conditions:**
Refrigerated sample received. Sample > 48 hours old when received
Test Code:
  THID (with CBC & diff)

Test Group:
  CD

Performing Lab:
  Immunology

Specimen Preparation:
  DO NOT refrigerate, store at room temperature and ship to China Basin.

Order CBCD if not already ordered on the same sample.

Preferred Volume:
  3 mL blood

Unacceptable Conditions:
  Refrigerated sample received. Sample > 48 hours old when received

RESULT INTERPRETATION

Units:
  % and x10^6 cells/L

Reference Interval:

<table>
<thead>
<tr>
<th>Population</th>
<th>% Lymphs</th>
<th>Absolute count</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 T Cells</td>
<td>24-64%</td>
<td>440-1496 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8 T Cells</td>
<td>14-40%</td>
<td>270-918 x10^6 cells/L</td>
</tr>
<tr>
<td>CD3 (total T) Cells</td>
<td>55-88%</td>
<td>715-2431 x10^6 cells/L</td>
</tr>
</tbody>
</table>

CD4 / CD8 (Helper/Suppressor) ratio: 0.7-3.9

Note: Reference values are for >= 18 year olds. For pediatric ranges please see:


Additional Information:

Both CD3 (total % T cells), CD3/CD4 (% Helper-Inducer T cells) and CD3/CD8 (% Suppressor-Cytotoxic T cells) are reported as well as the CD4/CD8 ratio.

Absolute cell counts require a CBC w/Differential on the same sample, which is ordered and charged separately if not otherwise available.

Note: In a legal opinion given to the Medical Center, attempting to circumvent a patient's refusal of HIV testing by using CD4 in its place is an (illegal) invasion of the patient's privacy unless a consent for HIV Testing is obtained.

CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
  86360; 86359

LOINC Codes:
  17146-2

COMPLETE VIEW
Available Stat:
No

Test Code:
THID (with CBC & diff)

Test Group:
CD

Performing Lab:
Immunology

Performed:
Monday-Saturday (day shift)

Methodology:
Flow cytometry

Remarks:
Keep sample at room temperature

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL blood

Unacceptable Conditions:
Refrigerated sample received. Sample > 48 hours old when received

Specimen Preparation:
DO NOT refrigerate, store at room temperature and ship to China Basin.

Order CBCD if not already ordered on the same sample.

Units:
% and x10^6 cells/L

Reference Interval:

<table>
<thead>
<tr>
<th>Population</th>
<th>% Lymphs</th>
<th>Absolute count</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4 T Cells</td>
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<td>CD3 (total T Cells)</td>
<td>55-88%</td>
<td>715-2431 x10^6 cells/L</td>
</tr>
</tbody>
</table>

CD4 / CD8 (Helper/Suppressor) ratio: 0.7-3.9

Note: Reference values are for >= 18 year olds. For pediatric ranges please see:


Synonyms:
- CD4
- CD8
- CD3
- Inducer
- Cytotoxic
- T cells
- CD4/CD8
- flow cytometry

**Reported:**

2-3 days

**Additional Information:**

Both CD3 (total % T cells), CD3/CD4 (% Helper-Inducer T cells) and CD3/CD8 (% Suppressor-Cytotoxic T cells) are reported as well as the CD4/CD8 ratio.

Absolute cell counts require a CBC w/Differential on the same sample, which is ordered and charged separately if not otherwise available.

**Note:** In a legal opinion given to the Medical Center, attempting to circumvent a patient's refusal of HIV testing by using CD4 in its place is an (illegal) invasion of the patient's privacy unless a consent for HIV Testing is obtained.

CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**

86360; 86359

**LOINC Codes:**

17146-2
Hematocrit (NLHCT-See Blood Gas Panel)

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus Chemistry and Mission Bay Blood Gas Lab

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Radiometer ABL 800

Reported:
15 minutes

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Plastic syringe containing 100 U of dry heparin
Capillary tube

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
55 µL blood

Stability (from collection to initiation):
Room temperature 30 minutes

Unacceptable Conditions:
Syringe received with needle attached

PROCESSING

Test Code:
NLHCT

Performing Lab:
Parnassus Chemistry and Mission Bay Blood Gas Lab

Preferred Volume:
3 mL blood

Minimum Volume:
55 µL blood

Unacceptable Conditions:
Syringe received with needle attached

Stability (from collection to initiation):
Room temperature 30 minutes

RESULT INTERPRETATION

Units:
Hct: %
Calculated Hgb: g/dL
Reference Interval:

<table>
<thead>
<tr>
<th>Hct</th>
<th>0-7 days</th>
<th>45-67%</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-14 days</td>
<td>42-66%</td>
<td></td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>39-63%</td>
<td></td>
</tr>
<tr>
<td>1-2 months</td>
<td>31-55%</td>
<td></td>
</tr>
<tr>
<td>2-3 months</td>
<td>28-42%</td>
<td></td>
</tr>
<tr>
<td>3-6 months</td>
<td>29-41%</td>
<td></td>
</tr>
<tr>
<td>6-24 months</td>
<td>33-39%</td>
<td></td>
</tr>
<tr>
<td>2-5 years</td>
<td>34-40%</td>
<td></td>
</tr>
<tr>
<td>5-12 years</td>
<td>35-45%</td>
<td></td>
</tr>
<tr>
<td>Male 12-15 years</td>
<td>37-49%</td>
<td></td>
</tr>
<tr>
<td>Male 15-18 years</td>
<td>38-49%</td>
<td></td>
</tr>
<tr>
<td>Male &gt; 18 years</td>
<td>41-53%</td>
<td></td>
</tr>
<tr>
<td>Female &gt; 12 years</td>
<td>36-46%</td>
<td></td>
</tr>
</tbody>
</table>

Calculated Hgb:

<table>
<thead>
<tr>
<th>0-7 days</th>
<th>14.5-22.5 g/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-14 days</td>
<td>13.5-21.5 g/dL</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>12.5-20.5 g/dL</td>
</tr>
<tr>
<td>1-2 months</td>
<td>10.0-18.0 g/dL</td>
</tr>
<tr>
<td>2-3 months</td>
<td>9.0-14.0 g/dL</td>
</tr>
<tr>
<td>3-6 months</td>
<td>9.5-13.5 g/dL</td>
</tr>
<tr>
<td>6-24 months</td>
<td>11.0-13.5 g/dL</td>
</tr>
<tr>
<td>2-5 years</td>
<td>11.2-13.5 g/dL</td>
</tr>
<tr>
<td>5-8 years</td>
<td>11.4-15.5 g/dL</td>
</tr>
<tr>
<td>8-12 years</td>
<td>11.6-15.5 g/dL</td>
</tr>
</tbody>
</table>

Critical Values:

Hemoglobin: <= 7.0 g/dL

ADMINISTRATIVE

CPT Codes:

85018

COMPLETE VIEW

Available Stat:

Yes

Test Code:

NLHCT

Performing Lab:

Parnassus Chemistry and Mission Bay Blood Gas Lab

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Radiometer ABL 800

Collect:

Plastic syringe containing 100 U of dry heparin
Capillary tube

Amount to Collect:

3 mL blood

Sample Type:

Heparinized whole blood

Preferred Volume:

3 mL blood

Minimum Volume:
55 µL blood

Unacceptable Conditions:
  Syringe received with needle attached

Units:
  Hct: %
  Calculated Hgb: g/dL

Reference Interval:

<table>
<thead>
<tr>
<th></th>
<th>Hct</th>
<th>Calculated Hgb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>45-67%</td>
<td>14.5-22.5 g/dL</td>
</tr>
<tr>
<td>8-14 days</td>
<td>42-66%</td>
<td>13.5-21.5 g/dL</td>
</tr>
<tr>
<td>2-4 weeks</td>
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</tr>
<tr>
<td>Female &gt; 12 years</td>
<td>36-46%</td>
<td>11.6-15.5 g/dL</td>
</tr>
</tbody>
</table>

Critical Values:
  Hemoglobin: <= 7.0 g/dL

Stability (from collection to initiation):
  Room temperature 30 minutes

Reported:
  15 minutes

CPT Codes:
  85018
Hematocrit, automated
HCT, HCTM, CBC, CBCD, ORHT, LBGH

**ORDERING**

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Performed: Test available 24 hours per day 7 days per week
Methodology: Calculation from MCV and RBC Count or measured by Conductance (iStat)
Reported: STAT 1 hour, Routine 4 hours
Additional Information: Also part of CBC & CBC w/differential

Reference ranges are also dependent upon the intensity of chronic exposure to high altitudes or to tobacco smoke, as well as to the duration of pregnancy. A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of cold agglutinins.

For technical reasons related to plasma trapping between the centrifuged RBCs, manual results are usually 1-2% higher than results by automated methods.

Conductance (e.g. iStat) method may yield spurious results in patients with high volume crystalloid infusion (particularly patients on bypass pump) or other plasma protein derangements. Conductance values may not compare well with calculated Hct results.

Capillary tubes for spun hematocrits require only 100 µL vs 250 µL for a microtainer, but they are leak-prone, fragile, hazardous to handle, less informative than a CBC and because they are imprecise should be run in duplicate, diminishing any benefit of requiring less blood volume. We discourage their use but will accept them for processing. Two capillaries should be submitted in a labeled tube to minimize breakage during transport, and should be accompanied by a requisition on which “SPUN HCT” is written next to the box checked for a CBC

**Synonyms:**
- Hct
- Crit
- PCV
- Packed cell volume

**COLLECTION**

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 1 mL blood
Preferred Volume: 1 mL blood
Minimum Volume: 250 µL (microtainer sample) See notes.

**PROCESSING**

Test Code:
HCT, HCTM, CBC, CBCD, ORHT, LBGH

Test Group:

Hct

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Hematology

Preferred Volume:

1 mL blood

Minimum Volume:

250 µL (microtainer sample) See notes.

RESULT INTERPRETATION

Units:

%

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>45-67%</td>
</tr>
<tr>
<td>8-14 days</td>
<td>42-66%</td>
</tr>
<tr>
<td>2-&lt;4 weeks</td>
<td>39-63%</td>
</tr>
<tr>
<td>1-&lt;2 months</td>
<td>31-55%</td>
</tr>
<tr>
<td>2-&lt;3 months</td>
<td>28-42%</td>
</tr>
<tr>
<td>3-&lt;6 months</td>
<td>29-41%</td>
</tr>
<tr>
<td>6-&lt;24 months</td>
<td>33-39%</td>
</tr>
<tr>
<td>2-&lt;5 years</td>
<td>34-40%</td>
</tr>
<tr>
<td>5-&lt;12 years</td>
<td>35-45%</td>
</tr>
<tr>
<td>Male 12-&lt;15 years</td>
<td>37-49%</td>
</tr>
<tr>
<td>Male 15-&lt;18 years</td>
<td>38-49%</td>
</tr>
<tr>
<td>Male &gt;= 18 years</td>
<td>41-53%</td>
</tr>
<tr>
<td>Female &gt;= 12 years</td>
<td>36-46%</td>
</tr>
</tbody>
</table>

Additional Information:

Also part of CBC & CBC w/differential

Reference ranges are also dependent upon the intensity of chronic exposure to high altitudes or to tobacco smoke, as well as to the duration of pregnancy. A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of cold agglutinins.

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Conductance (e.g. iStat) method may yield spurious results in patients with high volume crystalloid infusion (particularly patients on bypass pump) or other plasma protein derangements. Conductance values may not compare well with calculated Hct results.

Capillary tubes for spun hematocrits require only 100 µL vs 250 µL for a microtainer, but they are leak-prone, fragile, hazardous to handle, less informative than a CBC and because they are imprecise should be run in duplicate, diminishing any benefit of requiring less blood volume. We discourage their use but will accept them for processing. Two capillaries should be submitted in a labeled tube to minimize breakage during transport, and should be accompanied by a requisition on which “SPUN HCT” is written next to the box checked for a CBC

ADMINISTRATIVE

CPT Codes:

85014

COMPLETE VIEW

Available Stat:

Yes

Test Code:

HCT, HCTM, CBC, CBCD, ORHT, LBGH
Test Group:  
Hct

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:  
Test available 24 hours per day 7 days per week

Methodology:  
Calculation from MCV and RBC Count or measured by Conductance (iStat)

Collect:  
Lavender top

Amount to Collect:  
1 mL blood

Sample Type:  
EDTA whole blood

Preferred Volume:  
1 mL blood

Minimum Volume:  
250 uL (microtainer sample) See notes.

Units:  
%

Reference Interval:  
- 0-7 days: 45-67%
- 8-14 days: 42-66%
- 2-<4 weeks: 39-63%
- 1-<2 months: 31-55%
- 2-<3 months: 28-42%
- 3-<6 months: 29-41%
- 6-<24 months: 33-39%
- 2-<5 years: 34-40%
- 5-<12 years: 35-45%
- Male 12-<15 years: 37-49%
- Male 15-<18 years: 38-49%
- Male >=18 years: 41-53%
- Female >=12 years: 36-46%

Synonyms:  
- Hct
- Crit
- PCV
- Packed cell volume

Reported:  
STAT 1 hour, Routine 4 hours

Additional Information:  
Also part of CBC &CBC w/differential

Reference ranges are also dependent upon the intensity of chronic exposure to high altitudes or to tobacco smoke, as well as to the duration of pregnancy. A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of cold agglutinins.

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Capillary tubes for spun hematocrits require only 100 µL vs 250 µL for a microtainer, but they are leak-prone, fragile, hazardous to handle, less informative than a CBC and-because they are imprecise-should be run in duplicate, diminishing any benefit of requiring less blood volume. We discourage their use but will accept them for processing. Two capillaries should be submitted in a labeled tube to
minimize breakage during transport, and should be accompanied by a requisition on which "SPUN HCT" is written next to the box checked for a CBC

CPT Codes:
85014
Hematocrit, Body Fluid-Automated
BHCT

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Calculated (from MCV & RBC count)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.
Testing is only performed on visibly bloody samples.
Synonyms:
- Hct
- PCV
- Packed cell volume

COLLECTION

Sample Type:
EDTA anticoagulated body fluid
Collect:
Lavender top
Amount to Collect:
1 mL
Preferred Volume:
1 mL fluid
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Unacceptable Conditions:
Non-bloody sample. Testing is only performed on visibly bloody samples.

PROCESSING

Test Code:
BHCT
Test Group:
Hct
Performing Lab:
Parnassus & Mission Bay Hematology
Preferred Volume:
1 mL fluid
Unacceptable Conditions:
Non-bloody sample. Testing is only performed on visibly bloody samples.
RESULT INTERPRETATION

Units:
%  
Reference Interval:
RBCs are not normally present

Additional Information:
A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.

Testing is only performed on visibly bloody samples.

ADMINISTRATIVE

CPT Codes:
85014

LOINC Codes:
11153-4

COMPLETE VIEW

Available Stat:
Yes

Test Code:
BHCT

Test Group:
Hct

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Calculated (from MCV & RBC count)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top

Amount to Collect:
1 mL

Sample Type:
EDTA anticoagulated body fluid

Preferred Volume:
1 mL fluid

Unacceptable Conditions:
Non-bloody sample. Testing is only performed on visibly bloody samples.

Units:
%

Reference Interval:
RBCs are not normally present

Synonyms:
- Hct
- PCV
- Packed cell volume

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.

Testing is only performed on visibly bloody samples.

CPT Codes:
85014

LOINC Codes:
11153-4
**Hematocrit, Body Fluid-Manual**

**BHCTM**

### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus & Mission Bay Hematology

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Centrifugation

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.
- Testing is only performed on visibly bloody samples.

**Synonyms:**
- Hct
- PCV
- Packed cell volume

### COLLECTION

**Sample Type:**
- EDTA anticoagulated body fluid

**Collect:**
- Lavender top

**Amount to Collect:**
- 1 mL

**Preferred Volume:**
- 1 mL fluid

**Remarks:**
- Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Unacceptable Conditions:**
- Non-bloody sample. Testing is only performed on visibly bloody samples.

### PROCESSING

**Test Code:**
- BHCTM

**Test Group:**
- Hct

**Performing Lab:**
- Parnassus & Mission Bay Hematology

**Preferred Volume:**
- 1 mL fluid

**Unacceptable Conditions:**
- Non-bloody sample. Testing is only performed on visibly bloody samples.
RESULT INTERPRETATION

Units:
  %

Reference Interval:
  RBCs are not normally present

Additional Information:
  A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.

  Testing is only performed on visibly bloody samples.

ADMINISTRATIVE

CPT Codes:
  85013

LOINC Codes:
  4545-0

COMPLETE VIEW

Available Stat:
  Yes

Test Code:
  BHCTM

Test Group:
  Hct

Performing Lab:
  Parnassus & Mission Bay Hematology

Performed:
  Test available 24 hours per day 7 days per week

Methodology:
  Centrifugation

Remarks:
  Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
  Lavender top

Amount to Collect:
  1 mL

Sample Type:
  EDTA anticoagulated body fluid

Preferred Volume:
  1 mL fluid

Unacceptable Conditions:
  Non-bloody sample. Testing is only performed on visibly bloody samples.

Units:
  %

Reference Interval:
  RBCs are not normally present

Synonyms:
  - Hct
  - PCV
  - Packed cell volume

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
A manual assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen, such as the presence of small clots.

Testing is only performed on visibly bloody samples.

CPT Codes:
85013

LOINC Codes:
4545-0
Hemotocrit, spun
HCTM

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Hematology
Performed:
24 hours a day seven days a week
Methodology:
Centrifugation
Additional Information:
There are several variables which may result in inaccuracies in the measurement of a spun hematocrit and it’s use should be restricted to infants where the sample volume is more suitable.

Hemoglobin is a much more accurate and stable parameter in assessing patients for anemia and provides a better indication of oxygen carrying capacity.

Synonyms:
- Hct
- Crit
- PCV
- Packed cell volume
- microhematocrit

COLLECTION

Sample Type:
Whole blood
Collect:
Microhemtocrit tube
Amount to Collect:
Full microhematocrit tubes x2
Preferred Volume:
Full microhematocrit tubes x2
Minimum Volume:
3/4 full microhematocrit tubes x2
Remarks:
Collect from finger or heel skin puncture or fill tubes from well mixed syringe or vacutainer sample
Unacceptable Conditions:
Microhematocrit tubes received unsealed or sealed at both ends.

PROCESSING

Test Code:
HCTM
Performing Lab:
Parnassus & Mission Bay Hematology
Preferred Volume:
Full microhematocrit tubes x2
Minimum Volume:
3/4 full microhematocrit tubes x2
Unacceptable Conditions:
Microhematocrit tubes received unsealed or sealed at both ends.

RESULT INTERPRETATION

Units:
%

Reference Interval:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>45-67%</td>
</tr>
<tr>
<td>8-14 days</td>
<td>42-66%</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>39-63%</td>
</tr>
<tr>
<td>1-2 months</td>
<td>31-55%</td>
</tr>
<tr>
<td>2-3 months</td>
<td>28-42%</td>
</tr>
<tr>
<td>3-6 months</td>
<td>29-41%</td>
</tr>
<tr>
<td>6-24 months</td>
<td>33-39%</td>
</tr>
<tr>
<td>2-5 years</td>
<td>34-40%</td>
</tr>
<tr>
<td>5-12 years</td>
<td>35-45%</td>
</tr>
<tr>
<td>Male 12-15 years</td>
<td>37-49%</td>
</tr>
<tr>
<td>Male 15-18 years</td>
<td>38-49%</td>
</tr>
<tr>
<td>Male &gt; 18 years</td>
<td>41-53%</td>
</tr>
<tr>
<td>Female &gt; 12 years</td>
<td>36-46%</td>
</tr>
</tbody>
</table>

Critical Values:
<25%
or
>67% for patients 0-14 days old
>65% for patients >= 15 days old

Additional Information:
There are several variables which may result in inaccuracies in the measurement of a spun hematocrit and its use should be restricted to infants where the sample volume is more suitable.

Hemoglobin is a much more accurate and stable parameter in assessing patients for anemia and provides a better indication of oxygen carrying capacity.

ADMINISTRATIVE

CPT Codes:
85013

LOINC Codes:
4545-0

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HCTM

Performing Lab:
Parnassus & Mission Bay Hematology

Performed:
24 hours a day seven days a week

Methodology:
Centrifugation

Remarks:
Collect from finger or heel skin puncture or fill tubes from well mixed syringe or vacutainer sample

Collect:
Microhematocrit tube

**Amount to Collect:**
Full microhematocrit tubes x2

**Sample Type:**
Whole blood

**Preferred Volume:**
Full microhematocrit tubes x2

**Minimum Volume:**
3/4 full microhematocrit tubes x2

**Unacceptable Conditions:**
Microhematocrit tubes received unsealed or sealed at both ends.

**Units:**
%

**Reference Interval:**
- 0-7 days: 45-67%
- 8-14 days: 42-66%
- 2-4 weeks: 39-63%
- 1-2 months: 31-55%
- 2-3 months: 28-42%
- 3-6 months: 29-41%
- 6-24 months: 33-39%
- 2-5 years: 34-40%
- 5-12 years: 35-45%
- Male 12-15 years: 37-49%
- Male 15-18 years: 38-49%
- Male > 18 years: 41-53%
- Female > 12 years: 36-46%

**Critical Values:**
- <25%

  or

  >67% for patients 0-14 days old
  >65% for patients >= 15 days old

**Synonyms:**
- Hct
- Crit
- PCV
  - Packed cell volume
  - microhematocrit

**Additional Information:**
There are several variables which may result in inaccuracies in the measurement of a spun hematocrit and it's use should be restricted to infants where the sample volume is more suitable.

Hemoglobin is a much more accurate and stable parameter in assessing patients for anemia and provides a better indication of oxygen carrying capacity.

**CPT Codes:**
- 85013

**LOINC Codes:**
- 4545-0
Hemochromatosis, Hereditary
HHEM

ORDERING

Available Stat:  No
Performing Lab:  Medical Genomics - Molecular Diagnostics
Performed:  Run 1x per week as needed, Tuesday or Thursday, day shift only
Methodology:  PCR and allele-specific probes
Reported:  7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The Cys282Tyr (G845A, C282Y) mutation in the HLA-H gene is found in 85% of the chromosomes of patients with Hereditary Hemochromatosis.

Homozygosity for the C282Y or compound heterozygosity for C282Y and H63D mutations is associated with increased risk of iron overload. Despite the high frequency of the C282Y mutation the clinical penetrance of the homozygous C282Y genotype is estimated to only be 1-4% (Beutler, BE, Blood 101:3347, 2003)

Heterozygosity or homozygosity for the H63D mutation does not appear to be clinically significant but may be associated with elevated serum transferrin levels. (Gochee, et al., Gastroentrology 122:646, 2002)

Results are reported as "No Mutation Detected", "Heterozygous for Mutation" or "Homozygous for Mutation".

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

See also Iron, Transferrin and Transferrin Saturation and Iron, Liver.

Synonyms:
- Cys282Tyr
- G845A
- C282Y
- Hereditary Hemochromatosis
- HFE mutation
- HLA-H mutation

COLLECTION

Sample Type:
- EDTA whole blood, CVS, Tissue culture
Collect:
- Lavender top, (Blue (citrate) and Yellow (ACD) tops acceptable)
Amount to Collect:
- 3 mL blood
Preferred Volume:
- 3 mL blood
Minimum Volume:
0.1 mL blood

Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code: HHEM
Performing Lab: Medical Genomics - Molecular Diagnostics
Specimen Preparation: Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.
Preferred Volume: 3 mL blood
Minimum Volume: 0.1 mL blood
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

RESULT INTERPRETATION

Reference Interval:
No mutation detected.
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The Cys282Tyr (G845A, C282Y) mutation in the HLA-H gene is found in 85% of the chromosomes of patients with Hereditary Hemochromatosis.

Homozygosity for the C282Y or compound heterozygosity for C282Y and H63D mutations is associated with increased risk of iron overload. Despite the high frequency of the C282Y mutation the clinical penetrance of the homozygous C282Y genotype is estimated to only be 1-4% (Beutler, BE, Blood 101:3347, 2003)

Heterozygosity or homozygosity for the H63D mutation does not appear to be clinically significant but may be associated with elevated serum transferrin levels. (Gochee, et al., Gastroentrology 122:646, 2002)

Results are reported as "No Mutation Detected", "Heterozygous for Mutation" or "Homozygous for Mutation".

If a mutation is detected it is recommended that the patient seek genetic counseling.

Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

See also Iron, Transferrin and Transferrin Saturation and Iron, Liver.

ADMINISTRATIVE

CPT Codes: 81256
LDT or Modified FDA: Yes
LOINC Codes: 48577-1
Available Stat:
No
Test Code:
HHEM
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 1x per week as needed, Tuesday or Thursday, day shift only
Methodology:
PCR and allele-specific probes
Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Collect:
Lavender top, (Blue (citrate) and Yellow (ACD) tops acceptable)
Amount to Collect:
3 mL blood
Sample Type:
EDTA whole blood, CVS, Tissue culture
Preferred Volume:
3 mL blood
Minimum Volume:
0.1 mL blood
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.
Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.
Reference Interval:
No mutation detected.
Synonyms:
• Cys282Tyr
• G845A
• C282Y
• Hereditary Hemochromatosis
• HFE mutation
• HLA-H mutation
Reported:
7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The Cys282Tyr (G845A, C282Y) mutation in the HLA-H gene is found in 85% of the chromosomes of patients with Hereditary Hemochromatosis.

Homozygosity for the C282Y or compound heterozygosity for C282Y and H63D mutations is associated with increased risk of iron overload. Despite the high frequency of the C282Y mutation the clinical penetrance of the homozygous C282Y genotype is estimated to only be 1-4% (Beutler, BE, Blood 101:3347, 2003)

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Results are reported as "No Mutation Detected", "Heterozygous for Mutation" or "Homozygous for Mutation".

If a mutation is detected it is recommended that the patient seek genetic counseling.
Note: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

See also Iron, Transferrin and Transferrin Saturation and Iron, Liver.

**CPT Codes:**
- 81256

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 48577-1
Hemoglobin
HGB, CBC, CBCD, LBGH

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometry
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Reference ranges are altered by the intensity of chronic exposure to high altitudes or tobacco smoke, or by the duration of pregnancy.
A manual hemoglobin assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen.
Values are calculated from conductance hematocrit on iStat analyzer. Conductance methods for hematocrit may yield spurious results in patients with high volume crystalloid infusion (particularly patients on bypass pump) or other plasma protein derangements. Therefore hemoglobin values based on conductance may not compare well with measured Hgb results.

Synonyms:
- Hgb
- Hb

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood
Minimum Volume:
250 uL (microtainer)

PROCESSING

Test Code:
HGB, CBC, CBCD, LBGH
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
1 mL blood
Minimum Volume:
250 uL (microtainer)

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
  g/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>14.5-22.5 g/dL</td>
</tr>
<tr>
<td>8-14 days</td>
<td>13.5-21.5 g/dL</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>12.5-20.5 g/dL</td>
</tr>
<tr>
<td>1-&lt;2 months</td>
<td>10.0-18.0 g/dL</td>
</tr>
<tr>
<td>2-&lt;3 months</td>
<td>9.0-14.0 g/dL</td>
</tr>
<tr>
<td>3-&lt;6 months</td>
<td>9.5-13.5 g/dL</td>
</tr>
<tr>
<td>6-&lt;24 months</td>
<td>11.0-13.5 g/dL</td>
</tr>
<tr>
<td>2-&lt;5 years</td>
<td>11.2-13.5 g/dL</td>
</tr>
<tr>
<td>5-&lt;8 years</td>
<td>11.4-15.5 g/dL</td>
</tr>
<tr>
<td>8-&lt;12 years</td>
<td>11.6-15.5 g/dL</td>
</tr>
<tr>
<td>Male 12-&lt;15 years</td>
<td>12.3-16.0 g/dL</td>
</tr>
<tr>
<td>Male 15-&lt;18 years</td>
<td>12.6-17.0 g/dL</td>
</tr>
<tr>
<td>Male &gt;=18 years</td>
<td>13.6-17.5 g/dL</td>
</tr>
<tr>
<td>Female 12-&lt;15 years</td>
<td>11.8-15.5 g/dL</td>
</tr>
<tr>
<td>Female &gt;=15 years</td>
<td>12.0-15.5 g/dL</td>
</tr>
</tbody>
</table>

Critical Values:
<= 7.0 g/dl

Additional Information:
Reference ranges are altered by the intensity of chronic exposure to high altitudes or tobacco smoke, or by the duration of pregnancy.

A manual hemoglobin assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen.

Values are calculated from conductance hematocrit on iStat analyzer. Conductance methods for hematocrit may yield spurious results in patients with high volume crystalloid infusion (particularly patients on bypass pump) or other plasma protein derangements. Therefore hemoglobin values based on conductance may not compare well with measured Hgb results.

ADMINISTRATIVE

CPT Codes:
  85018

COMPLETE VIEW

Available Stat:
  Yes

Test Code:
  HGB, CBC, CBCD, LBGH

Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
  Test available 24 hours per day 7 days per week

Methodology:
  Spectrophotometry

Collect:
  Lavender top

Amount to Collect:
  1 mL blood

Sample Type:
  EDTA whole blood

Preferred Volume:
  1 mL blood

Minimum Volume:
  250 uL (microtainer)
**Units:**
g/dL

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>14.5-22.5 g/dL</td>
</tr>
<tr>
<td>8-14 days</td>
<td>13.5-21.5 g/dL</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>12.5-20.5 g/dL</td>
</tr>
<tr>
<td>1-&lt;2 months</td>
<td>10.0-18.0 g/dL</td>
</tr>
<tr>
<td>2-&lt;3 months</td>
<td>9.0-14.0 g/dL</td>
</tr>
<tr>
<td>3-&lt;6 months</td>
<td>9.5-13.5 g/dL</td>
</tr>
<tr>
<td>6-&lt;24 months</td>
<td>11.0-13.5 g/dL</td>
</tr>
<tr>
<td>2-&lt;5 years</td>
<td>11.2-13.5 g/dL</td>
</tr>
<tr>
<td>5-&lt;8 years</td>
<td>11.4-15.5 g/dL</td>
</tr>
<tr>
<td>8-&lt;12 years</td>
<td>11.6-15.5 g/dL</td>
</tr>
<tr>
<td>Male 12-&lt;15 years</td>
<td>12.3-16.0 g/dL</td>
</tr>
<tr>
<td>Male 15-&lt;18 years</td>
<td>12.6-17.0 g/dL</td>
</tr>
<tr>
<td>Male &gt;=18 years</td>
<td>13.6-17.5 g/dL</td>
</tr>
<tr>
<td>Female 12-&lt;15 years</td>
<td>11.8-15.5 g/dL</td>
</tr>
<tr>
<td>Female &gt;=15 years</td>
<td>12.0-15.5 g/dL</td>
</tr>
</tbody>
</table>

**Critical Values:**

<= 7.0 g/dL

**Synonyms:**
- Hgb
- Hb

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
Reference ranges are altered by the intensity of chronic exposure to high altitudes or tobacco smoke, or by the duration of pregnancy.

A manual hemoglobin assay will be performed whenever accurate results cannot be obtained on an automated instrument because of some intrinsic abnormality of the specimen.

Values are calculated from conductance hematocrit on iStat analyzer. Conductance methods for hematocrit may yield spurious results in patients with high volume crystalloid infusion (particularly patients on bypass pump) or other plasma protein derangements. Therefore hemoglobin values based on conductance may not compare well with measured Hgb results.

**CPT Codes:**

85018
Hemoglobin A1c
HBA1

ORDERING

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Monday-Friday (day shift)

Methodology:
Bio-Rad Variant II Turbo 2.0 (HPLC-Ion Exchange)

Reported:
1-3 days

Additional Information:

INTERFERENCES:

A Hgb F level of >25% as well as some mutant hemoglobins will interfere with the assay. Hemoglobin variants S, C, D & E have no effect on the assay when they exist in the heterozygous state.

Serum glycated albumin (fructosamine) testing can be ordered as an alternative means of monitoring glucose control when interferences preclude following A1c by this method.

In diabetic patients who have experienced recent blood loss, hemolysis, or have elevated reticulocyte counts for other reasons, the HgBA1c level may be lowered and may not reflect actual glycemic control.

TESTING RECOMMENDATIONS:

Management of Diabetes:

Goals for HbA1c management recommended by American Diabetes Association (ADA) Standards of Medical Care in Diabetes (Diabetes Care, Volume 33, Supplement 1, January 2010) are as follows:

When using this assay, the ADA recommended goal for A1c control for adult diabetic patients in general is <7% although use of an A1c goal as close to normal as possible without causing significant hypoglycemia may be appropriate for individual patients. In pregnant patients with diabetes, the ADA recommends aiming for the range < 6% if it can be achieved without excessive hypoglycemia.

The ADA recommended goals for other age groups are:

0-6 years old 7.6% - 8.4%
6-12 years old <8%
13-19 years old <7.5%
>19 years <7%

Diagnosis of diabetes or increased risk for diabetes: The American Diabetes Association recommends the following HbA1c cutoffs when assessing increased risk for diabetes and when diagnosing diabetes.

5.7% - 6.4% Increased risk for diabetes
>6.4% Consistent with diabetes

Note: In the absence of unequivocal hyperglycemia, the diagnosis of diabetes should be confirmed by repeat testing.

Receiver operating curve analyses of nationally representative U.S. data (NHANES 2005-2006) indicate that among the nondiabetic adult population, an A1C value of 5.7%, compared with other cut points, has the best combination of sensitivity (39%) and specificity (91%) to identify cases of impaired fasting glucose (FPG >= 100 mg/dl [5.6 mmol/l]). Note that individuals with an A1c < 5.7% may still be at risk, depending on the level of A1c and presence of other risk factors, such as obesity and family history. Individuals with an A1c > 6% should be considered at very high risk for diabetes.

Certification/Traceability/Precision:
The Variant II Turbo Hemoglobin A1c 2.0 Program have been certified by the NGSP (National Glycohemoglobin Standardization Program) as having documented traceability to the Diabetes Control and Complications Trial reference method. These HPLC ion exchange methods yield results that correspond closely to results obtained in independent reference laboratory assays. In patients with elevated A1c levels, results determined by the point of care DCAVantage device may run approximately 0.4 units lower than this HPLC method.

The coefficient of variation (CV) for these HPLC assays around A1C levels of 6 - 9 is < 2%. Based on the CV of these assays, there is a 95% probability that a change in A1c results of 0.5 units or more is real and not due to analytic variation (Little RR, et al, Clinical Chemistry 57:205-214, 2011).

**Synonyms:**
- Glyco-hgb
- Glycohemoglobin
- Glycosylated hemoglobin
- Hgb A1
- HgbA1c
- Glycated hemoglobin

**COLLECTION**

**Sample Type:**
EDTA whole blood

**Collect:**
Lavender top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
1 mL blood

**PROCESSING**

**Test Code:**
HBA1

**Test Group:**
Hemoglobin A1c

**Performing Lab:**
China Basin Chemistry

**Specimen Preparation:**
Do not centrifuge.

**Preferred Volume:**
1 mL blood

**RESULT INTERPRETATION**

**Units:**
%

**Reference Interval:**
Non-Diabetic: 4.3-5.6%

**Additional Information:**

**INTERFERENCES:**
- A Hgb F level of >25% as well as some mutant hemoglobins will interfere with the assay. Hemoglobin variants S, C, D & E have no effect on the assay when they exist in the heterozygous state.
- Serum glycated albumin (fructosamine) testing can be ordered as an alternative means of monitoring glucose control when interferences preclude following A1c by this method.
In diabetic patients who have experienced recent blood loss, hemolysis, or have elevated reticulocyte counts for other reasons, the HgBA1c level may be lowered and may not reflect actual glycemic control.

TESTING RECOMMENDATIONS:

Management of Diabetes:

Goals for HbA1c management recommended by American Diabetes Association (ADA) Standards of Medical Care in Diabetes (Diabetes Care, Volume 33, Supplement 1, January 2010) are as follows:

When using this assay, the ADA recommended goal for A1c control for adult diabetic patients in general is <7% although use of an A1c goal as close to normal as possible without causing significant hypoglycemia may be appropriate for individual patients. In pregnant patients with diabetes, the ADA recommends aiming for the range < 6% if it can be achieved without excessive hypoglycemia.

The ADA recommended goals for other age groups are:

- 0-6 years old: 7.6% - 8.4%
- 6-12 years old: <8%
- 13-19 years old: <7.5%
- >19 years: <7%

Diagnosis of diabetes or increased risk for diabetes: The American Diabetes Association recommends the following HbA1c cutoffs when assessing increased risk for diabetes and when diagnosing diabetes.

- 5.7% - 6.4%: Increased risk for diabetes
- >6.4%: Consistent with diabetes

Note: In the absence of unequivocal hyperglycemia, the diagnosis of diabetes should be confirmed by repeat testing.

Receiver operating curve analyses of nationally representative U.S. data (NHANES 2005-2006) indicate that among the nondiabetic adult population, an A1C value of 5.7%, compared with other cut points, has the best combination of sensitivity (39%) and specificity (91%) to identify cases of impaired fasting glucose (FPG >= 100 mg/dl [5.6 mmol/l]). Note that individuals with an A1c < 5.7% may still be at risk, depending on the level of A1c and presence of other risk factors, such as obesity and family history. Individuals with an A1c > 6% should be considered at very high risk for diabetes.

Certification/Traceability/Precision:

The Variant II Turbo Hemoglobin A1c 2.0 Program have been certified by the NGSP (National Glycohemoglobin Standardization Program) as having documented traceability to the Diabetes Control and Complications Trial reference method. These HPLC ion exchange methods yield results that correspond closely to results obtained in independent reference laboratory assays. In patients with elevated A1c levels, results determined by the point of care DCAVantage device may run approximately 0.4 units lower than this HPLC method.

The coefficient of variation (CV) for these HPLC assays around A1C levels of 6 - 9 is < 2%. Based on the CV of these assays, there is a 95% probability that a change in A1c results of 0.5 units or more is real and not due to analytic variation (Little RR, et al, Clinical Chemistry 57:205-214, 2011).

ADMINISTRATIVE

CPT Codes:
- 83036

LOINC Codes:
- 17856-6

COMPLETE VIEW

Available Stat:
- No

Test Code:
- HBA1
Test Group:
  Hemoglobin A1c
Performing Lab:
  China Basin Chemistry
Performed:
  Monday-Friday (day shift)
Methodology:
  Bio-Rad Variant II Turbo 2.0 (HPLC-Ion Exchange)
Collect:
  Lavender top
Amount to Collect:
  1 mL blood
Sample Type:
  EDTA whole blood
Preferred Volume:
  1 mL blood
Specimen Preparation:
  Do not centrifuge.
Units:
  %
Reference Interval:
  Non-Diabetic: 4.3-5.6%
Synonyms:
  • Glyco-hgb
  • Glycohemoglobin
  • Glycosylated hemoglobin
  • Hgb A1
  • HgbA1c
  • Glycated hemoglobin
Reported:
  1-3 days
Additional Information:

INTERFERENCES:

A Hgb F level of >25% as well as some mutant hemoglobins will interfere with the assay. Hemoglobin variants S, C, D & E have no effect on the assay when they exist in the heterozygous state.

Serum glycated albumin (fructosamine) testing can be ordered as an alternative means of monitoring glucose control when interferences preclude following A1c by this method.

In diabetic patients who have experienced recent blood loss, hemolysis, or have elevated reticulocyte counts for other reasons, the HgbA1c level may be lowered and may not reflect actual glycemic control.

TESTING RECOMMENDATIONS:

Management of Diabetes:

Goals for HbA1c management recommended by American Diabetes Association (ADA) Standards of Medical Care in Diabetes (Diabetes Care, Volume 33, Supplement 1, January 2010) are as follows:

When using this assay, the ADA recommended goal for A1c control for adult diabetic patients in general is <7% although use of an A1c goal as close to normal as possible without causing significant hypoglycemia may be appropriate for individual patients. In pregnant patients with diabetes, the ADA recommends aiming for the range < 6% if it can be achieved without excessive hypoglycemia.

The ADA recommended goals for other age groups are:
  0-6 years old    7.6% - 8.4%
  6-12 years old  <8%
Diagnosis of diabetes or increased risk for diabetes: The American Diabetes Association recommends the following HbA1c cutoffs when assessing increased risk for diabetes and when diagnosing diabetes.

- 5.7% - 6.4% Increased risk for diabetes
- >6.4% Consistent with diabetes

Note: In the absence of unequivocal hyperglycemia, the diagnosis of diabetes should be confirmed by repeat testing.

Receiver operating curve analyses of nationally representative U.S. data (NHANES 2005-2006) indicate that among the nondiabetic adult population, an A1C value of 5.7%, compared with other cut points, has the best combination of sensitivity (39%) and specificity (91%) to identify cases of impaired fasting glucose (FPG >= 100 mg/dl [5.6 mmol/l]). Note that individuals with an A1c < 5.7% may still be at risk, depending on the level of A1c and presence of other risk factors, such as obesity and family history. Individuals with an A1c > 6% should be considered at very high risk for diabetes.

Certification/Traceability/Precision:

The Variant II Turbo Hemoglobin A1c 2.0 Program have been certified by the NGSP (National Glycohemoglobin Standardization Program) as having documented traceability to the Diabetes Control and Complications Trial reference method. These HPLC ion exchange methods yield results that correspond closely to results obtained in independent reference laboratory assays. In patients with elevated A1c levels, results determined by the point of care DCAVantage device may run approximately 0.4 units lower than this HPLC method.

The coefficient of variation (CV) for these HPLC assays around A1C levels of 6 - 9 is < 2%. Based on the CV of these assays, there is a 95% probability that a change in A1c results of 0.5 units or more is real and not due to analytic variation (Little RR, et al, Clinical Chemistry 57:205-214, 2011).

CPT Codes:
- 83036

LOINC Codes:
- 17856-6
Hemoglobinopathy Evaluation
HBEP

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Set up Mondays and Thursdays, reports next day.
Methodology: Capillary Electrophoresis (on Sebia Capillaries 2 Flex Piercing) and HPLC Electrophoresis (on Bio Rad Variant II) (+/- Electrophoresis)
Reported: 1-8 days
Additional Information:
Only A, A2 and F are normally present; the latter is almost completely replaced by A at age two. Hemoglobins A, A2, S, C, F, D or G, E or O, and fast hemoglobins, e.g., Hgb Bart's, are separated and quantitated.
HPLC and capillary electrophoresis are rapid and reproducible methods for identifying variants; however, it is possible that a rare variant may be missed. If clinical indications strongly suggest a variant hemoglobin not identified by HPLC & capillary electrophoresis, please contact the Chemistry Laboratory at 353-4820.
Iron deficiency decreases Hgb A2, and the characteristic elevation of Hgb A2 in beta-thalassemia may easily be missed.
Note: The HPLC test was developed by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Alkali denaturation
- sickle hemoglobin
- HbSS
- Hemoglobin A2
- Hemoglobin F
- fetal hemoglobin
- hemoglobin E
- Hemoglobin C
- hemoglobin electrophoresis
- Hemoglobin Bart's
- sickle screen
- sickledex
- HbC
- HbS
- HbE
- Hgb S
- Hgb C
- HGB E

COLLECTION

Sample Type: EDTA whole blood
Collect:
Lavender top

Amount to Collect:
2 mL blood

Preferred Volume:
2 mL blood

Minimum Volume:
1 mL blood

Stability (from collection to initiation):
Refrigerated 1 week

PROCESSING

Test Code:
HBEP

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Do not centrifuge. Refrigerate samples

Preferred Volume:
2 mL blood

Minimum Volume:
1 mL blood

Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Units:
%

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Hgb F</th>
<th>Hgb A2</th>
<th>Hgb A</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 6 days</td>
<td>77.0-97.9%</td>
<td>&lt;1.0%</td>
<td>2.4-22.4%</td>
</tr>
<tr>
<td>7 to 14 days</td>
<td>79.6-91.4%</td>
<td>0.0-1.0%</td>
<td>8.5-19.8%</td>
</tr>
<tr>
<td>15 to 45 days</td>
<td>59.8-89.6%</td>
<td>0.0-1.5%</td>
<td>12.9-51.1%</td>
</tr>
<tr>
<td>46 days to &lt; 3 months</td>
<td>23.9-67.2%</td>
<td>0.6-1.9%</td>
<td>35.8-77.3%</td>
</tr>
<tr>
<td>3 month to &lt; 6 months</td>
<td>4.4-27.5%</td>
<td>1.7-2.8%</td>
<td>75.3-96.6%</td>
</tr>
<tr>
<td>6 months to &lt; 9 months</td>
<td>1.5-27.8%</td>
<td>2.1-2.9%</td>
<td>81.1-97.6%</td>
</tr>
<tr>
<td>9 months to &lt; 15 months</td>
<td>0.4-8.4%</td>
<td>2.2-3.2%</td>
<td>91.2-98.3%</td>
</tr>
<tr>
<td>15 months to &lt; 2 years</td>
<td>0.1-4.9%</td>
<td>2.2-3.2%</td>
<td>94.4-98.0%</td>
</tr>
<tr>
<td>2 years to &lt; 6 years</td>
<td>0.0-3.7%</td>
<td>2.2-3.2%</td>
<td>95.7-98.0%</td>
</tr>
<tr>
<td>6 years and older</td>
<td>&lt;1.0%</td>
<td>2.2-3.2%</td>
<td>96.7-97.8%</td>
</tr>
</tbody>
</table>

Additional Information:
Only A, A2 and F are normally present; the latter is almost completely replaced by A at age two. Hemoglobins A, A2, S, C, F, D or G, E or O, and fast hemoglobins, e.g., Hgb Bart's, are separated and quantitated.

HPLC and capillary electrophoresis are rapid and reproducible methods for identifying variants; however, it is possible that a rare variant may be missed. If clinical indications strongly suggest a variant hemoglobin not identified by HPLC & capillary electrophoresis, please contact the Chemistry Laboratory at 353-4820.

Iron deficiency decreases Hgb A2, and the characteristic elevation of Hgb A2 in beta-thalassemia may easily be missed.

Note: The HPLC test was developed by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Interpretive Data:
Only A, A2 and F are normally present; the latter is almost completely replaced by A at age two. Hemoglobins A, A2, S, C, F, D or G, E or O, and fast hemoglobins, e.g., Hgb Bart's, are separated and quantitated.
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ADMINISTRATIVE

CPT Codes:
83021; 83020
LDT or Modified FDA:
Yes
LOINC Codes:
49322-1

COMPLETE VIEW

Available Stat:
No
Test Code:
HBEP
Performing Lab:
China Basin Chemistry
Performed:
Set up Mondays and Thursdays, reports next day.
Methodology:
Capillary Electrophoresis (on Sebia Capillarys 2 Flex Piercing) and HPLC Electrophoresis (on Bio Rad Variant II) (+/- Electrophoresis)
Collect:
Lavender top
Amount to Collect:
2 mL blood
Sample Type:
EDTA whole blood
Preferred Volume:
2 mL blood
Minimum Volume:
1 mL blood
Specimen Preparation:
Do not centrifuge. Refrigerate samples
Units:
%
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Hgb F</th>
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<th>Hgb A</th>
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<tr>
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</tr>
<tr>
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<td>2.2-3.2%</td>
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</tr>
<tr>
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Interpretive Data:

Only A, A2 and F are normally present; the latter is almost completely replaced by A at age two. Hemoglobins A, A2, S, C, F, D or G, E or O, and fast hemoglobins, e.g., Hgb Bart’s, are separated and quantitated.

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Note: The HPLC test was developed by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:

- Alkali denaturation
- sickle hemoglobin
- HbSS
- Hemoglobin A2
- Hemoglobin F
- fetal hemoglobin
- hemoglobin E
- Hemoglobin C
- hemoglobin electrophoresis
- Hemoglobin Bart's
- sickle screen
- sickledex
- HbC
- HbS
- HbE
- Hgb S
- Hgb C
- HGB E

Stability (from collection to initiation):

Refrigerated 1 week

Reported:

1-8 days

Additional Information:

Only A, A2 and F are normally present; the latter is almost completely replaced by A at age two. Hemoglobins A, A2, S, C, F, D or G, E or O, and fast hemoglobins, e.g., Hgb Bart’s, are separated and quantitated.

HPLC and capillary electrophoresis are rapid and reproducible methods for identifying variants; however, it is possible that a rare variant may be missed. If clinical indications strongly suggest a variant hemoglobin not identified by HPLC & capillary electrophoresis, please contact the Chemistry Laboratory at 353-4820.

Iron deficiency decreases Hgb A2, and the characteristic elevation of Hgb A2 in beta-thalassemia may easily be missed.

Note: The HPLC test was developed by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:

83021; 83020

LDT or Modified FDA:

Yes

LOINC Codes:

49322-1
Hemosiderin Stain, urine

ORDERING

Available Stat: 
No
Performing Lab: 
Parnassus Hematology
Performed: 
Test run 0800-1500 Monday-Friday
Methodology: 
Prussian Blue stain of urine sediment
Reported: 
Same day or next weekday

COLLECTION

Sample Type: 
1st AM void urine
Collect: 
Urine cup
Amount to Collect: 
See preferred volume
Preferred Volume: 
50 mL urine
Unacceptable Conditions: 
Collected in non-plastic container

PROCESSING

Test Code: 
HMSU
Performing Lab: 
Parnassus Hematology
Preferred Volume: 
50 mL urine
Unacceptable Conditions: 
Collected in non-plastic container

RESULT INTERPRETATION

Reference Interval: 
Negative

ADMINISTRATIVE

CPT Codes: 
83070
LOINC Codes: 
4644-1
Available Stat: No
Test Code: HMSU
Performing Lab: Parnassus Hematology
Performed: Test run 0800-1500 Monday-Friday
Methodology: Prussian Blue stain of urine sediment
Collect: Urine cup
Amount to Collect: See preferred volume
Sample Type: 1st AM void urine
Preferred Volume: 50 mL urine
Unacceptable Conditions: Collected in non-plastic container
Reference Interval: Negative
Reported: Same day or next weekday
CPT Codes: 83070
LOINC Codes: 4644-1
Heparin Induced Thrombocytopenia (HIT) Antibody Testing

ORDERING

Ordering Recommendations:
The pretest likelihood of HIT can be assessed by the 4T’s:

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of thrombocytopenia</td>
<td>2</td>
</tr>
<tr>
<td>Timing of fall</td>
<td>1</td>
</tr>
<tr>
<td>Thrombosis or sequelae</td>
<td>1</td>
</tr>
<tr>
<td>Other cause of thrombocytopenia</td>
<td>1</td>
</tr>
</tbody>
</table>

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<tr>
<td>Thrombosis or sequelae</td>
<td>1</td>
</tr>
<tr>
<td>Other cause of thrombocytopenia</td>
<td>1</td>
</tr>
</tbody>
</table>

- Score 1-3: Low
- Score 4-5: Intermediate
- Score 6-8: High


Approval Required:
No, but if "washed platelet-heparin induced platelet activation" is required before result of heparin-PF4 ELISA test is available, please contact hematology at x3-1747

Available Stat:
No

Performing Lab:
Machaon Diagnostics

Methodology:
Enzyme Linked Immunosorbent Assay

Reported:
1-2 days

Additional Information:
A negative test does not exclude thrombotic risk due to heparin induced thrombocytopenia (HIT), nor does a positive test exclude other causes of thrombocytopenia. Correlation with wp-HIPA, platelet counts, and clinical findings can be important for diagnosis of HIT.

Antibodies to heparin-PF4 complexes are found in the majority of patients with clinical findings of heparin-induced thrombocytopenia (HIT), but also in variable numbers of heparinized patients without thrombocytopenia.

For assistance in interpreting results, please contact the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966. Or you may contact Hematology lab resident at 353-1747.

Reflex Testing:
A heparin antibody by ELISA method will be performed initially. If results are positive, will reflex to a washed platelet heparin-induced platelet activation method (wp-HIPA).

Synonyms:
- HIT
- heparin induced thrombocytopenia
- platelet factor 4
- HIT panel
- HPA
- heparin induced platelet antibody
- HIPAB
SRAU
- Serotonin Release Assay

**COLLECTION**

Sample Type:
- Serum

Collect:
- Red top

Amount to Collect:
- 2 mL blood

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Stability (from collection to initiation):
- Frozen 7 days

Rejection Criteria:
- Sample thawed on receipt

**PROCESSING**

Test Code:
- HEPAB

Test Group:
- HIT

Sendout:
- Yes

Performing Lab:
- Machaon Diagnostics

Specimen Preparation:
- Deliver specimen immediately to Hematology M524 for processing.

**Hematology**: Freeze serum at -20C. Order Machaon test "heparin pf4 w/ reflex to wp-HIPA".

If the Reflex test for wp-HIPA is required, the test code HEPWP will be ordered to bill the additional charge when the results are entered at China Basin.

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Rejection Criteria:
- Sample thawed on receipt

Stability (from collection to initiation):
- Frozen 7 days

**RESULT INTERPRETATION**

Reference Interval:
- Heparin antibody by Elisa: Negative
- wp-HIPA: Normal

Additional Information:
- A negative test does not exclude thrombotic risk due to heparin induced thrombocytopenia (HIT), nor does a positive test exclude other causes of thrombocytopenia. Correlation with wp-HIPA, platelet counts, and clinical findings can be important for diagnosis of HIT.
Antibodies to heparin-PF4 complexes are found in the majority of patients with clinical findings of heparin-induced thrombocytopenia (HIT), but also in variable numbers of heparinized patients without thrombocytopenia.

For assistance in interpreting results, please contact the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966. Or you may contact Hematology lab resident at 353-1747.

**ADMINISTRATIVE**

**CPT Codes:**
- 83520-90 (HEPAB)
- 86022-90 x3 (HEPWP)

**LOINC Codes:**
- 45155-9 (HEPAB)
- 50736-8 (HEPWP)

**COMPLETE VIEW**

**Approval Required:**
No, but if "washed platelet-heparin induced platelet activation" is required before result of heparin-PF4 ELISA test is available, please contact hematology at x3-1747

**Available Stat:**
No

**Ordering Recommendations:**
The pretest likelihood of HIT can be assessed by the 4T's:

<table>
<thead>
<tr>
<th>Category</th>
<th>2 points</th>
<th>1 point</th>
<th>0 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree of</td>
<td>Fall &gt; 50% and nadir &gt;= 20K</td>
<td>Fall 30-50% or nadir 10K-19K</td>
<td>Fall &lt; 30% or nadir &lt; 10K</td>
</tr>
<tr>
<td>thrombocytopenia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timing of fall</td>
<td>5-14 days post heparin or &lt;= 1 day if prior exposure &lt; 30 days</td>
<td>Consistent with days 5-14 fall, but not clear or onset after day 14 or fall &lt;= 1 day (with heparin exposure 30-100 days ago)</td>
<td>&lt;= 4 days with recent exposure</td>
</tr>
<tr>
<td>Thrombsis or</td>
<td>New thrombosis; skin necrosis; acute systemic reaction post IV unfract. heparin</td>
<td>Progressive or recurrent thrombosis; skin erythema w/out necrosis; suspected thrombosis only (not confirmed)</td>
<td>None</td>
</tr>
<tr>
<td>sequelae</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other cause of</td>
<td>None apparent</td>
<td>Possible</td>
<td>Definite</td>
</tr>
<tr>
<td>thrombocytopenia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Score Probability of HIT
1-3 Low
4-5 Intermediate
6-8 High


**Test Code:**
HEPAB

**Test Group:**
HIT

**Performing Lab:**
Machaon Diagnostics

**Sendout:**
Yes

**Methodology:**
Enzyme Linked Immunosorbent Assay

**Collect:**
Red top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum
Minimum Volume:
0.5 mL serum

Rejection Criteria:
Sample thawed on receipt

Specimen Preparation:
Deliver specimen immediately to Hematology M524 for processing.

Hematology: Freeze serum at -20C. Order Machaon test "heparin pf4 w/ reflex to wp-HIPA".

If the Reflex test for wp-HIPA is required, the test code HEPWP will be ordered to bill the additional charge when the results are entered at China Basin.

Reference Interval:
Heparin antibody by Elisa: Negative
wp-HIPA: Normal

Synonyms:
- HIT
- heparin induced thrombocytopenia
- platelet factor 4
- HIT panel
- HPA
- heparin induced platelet antibody
- HIPAB
- SRAU
- Serotonin Release Assay

Stability (from collection to initiation):
Frozen 7 days

Reported:
1-2 days

Reflex Testing:
A heparin antibody by ELISA method will be performed initially. If results are positive, will reflex to a washed platelet heparin-induced platelet activation method (wp-HIPA).

Additional Information:
A negative test does not exclude thrombotic risk due to heparin induced thrombocytopenia (HIT), nor does a positive test exclude other causes of thrombocytopenia. Correlation with wp-HIPA, platelet counts, and clinical findings can be important for diagnosis of HIT.

Antibodies to heparin-PF4 complexes are found in the majority of patients with clinical findings of heparin-induced thrombocytopenia (HIT), but also in variable numbers of heparinized patients without thrombocytopenia.

For assistance in interpreting results, please contact the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966. Or you may contact Hematology lab resident at 353-1747.

CPT Codes:
83520-90 (HEPAB), 86022-90 x3 (HEPWP)

LOINC Codes:
45155-9 (HEPAB), 50736-8 (HEPWP)
**Hepatitis A virus, IgG Antibody**  
HAVIGG

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday day shift

**Methodology:**
- Microparticle Chemiluminescent Immunoassay

**Reported:**
- 1-3 days

**Additional Information:**
This test detected IgG antibodies to the Hepatitis A virus. IgG antibodies can result from either prior exposure or infection with Hepatitis A or from vaccination.

- The test should **not** be used to diagnose acute Hepatitis A infection.

- Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required

**Synonyms:**
- Hepatitis A Antibody
- HAV
- anti-HAV antibody
- HAAb

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Stability (from collection to initiation):**
- Refrigerated 6 days

### PROCESSING

**Test Code:**
- HAVIGG

**Test Group:**
- Hepatitis

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Refrigerate serum

**Preferred Volume:**
- 0.5 mL serum
Stability (from collection to initiation):
Refrigerated 6 days

RESULT INTERPRETATION

Units:
mlU/mL

Reference Interval:
Negative

Additional Information:
This test detected IgG antibodies to the Hepatitis A virus. IgG antibodies can result from either prior exposure or infection with Hepatitis A or from vaccination.

This test should not be used to diagnose acute Hepatitis A infection.

Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required

ADMINISTRATIVE

CPT Codes:
86790

COMPLETE VIEW

Available Stat:
No

Test Code:
HAVIGG

Test Group:
Hepatitis

Performing Lab:
Immunology

Performed:
Monday-Friday day shift

Methodology:
Microparticle Chemiluminescent Immunoassay

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate serum

Units:
mlU/mL

Reference Interval:
Negative

Synonyms:
• Hepatitis A Antibody
• HAV
• anti-HAV antibody
• HAAb

**Stability (from collection to initiation):**

Refrigerated 6 days

**Reported:**

1-3 days

**Additional Information:**

This test detected IgG antibodies to the Hepatitis A virus. IgG antibodies can result from either prior exposure or infection with Hepatitis A or from vaccination.

This test should **not** be used to diagnose acute Hepatitis A infection.

Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required

**CPT Codes:**

86790
Hepatitis A virus, IgM Antibody
HAVM

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Twice per week
Methodology: Microparticle Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:
This is test of choice for the diagnosis of acute HAV infection; it is positive at the time a patient presents with clinical illness. The IgM antibody persists for up to 6 months, and a negative IgM antibody test rules out acute HAV infection in an immunocompetent subject.

For determination of immunity or vaccine response ‘HAV Ab, Total’ is the appropriate test to order

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- HAV IgM Antibody
- HAV IgM Ab
- HAAb
- anti-HAV antibody

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Stability (from collection to initiation): Refrigerated 6 days

PROCESSING

Test Code: HAVM
Test Group: Hepatitis
Performing Lab: Immunology
Specimen Preparation: Refrigerate serum.
Preferred Volume: 0.5 mL serum

Printed 06/07/19
Test information subject to change
Stability (from collection to initiation):
Refrigerated 6 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
This is test of choice for the diagnosis of acute HAV infection; it is positive at the time a patient presents with clinical illness. The IgM antibody persists for up to 6 months, and a negative IgM antibody test rules out acute HAV infection in an immunocompetent subject.

For determination of immunity or vaccine response 'HAV Ab, Total' is the appropriate test to order

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
86709

LOINC Codes:
13950-1

COMPLETE VIEW

Available Stat:
No

Test Code:
HAVM

Test Group:
Hepatitis

Performing Lab:
Immunology

Performed:
Twice per week

Methodology:
Microparticle Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate serum.

Reference Interval:
Negative

Synonyms:
• HAV IgM Antibody
• HAV IgM Ab
• HAAb
• anti-HAV antibody

Stability (from collection to initiation):
Refrigerated 6 days
Refrigerated 6 days

**Reported:**
1-4 days

**Additional Information:**
This is test of choice for the diagnosis of acute HAV infection; it is positive at the time a patient presents with clinical illness. The IgM antibody persists for up to 6 months, and a negative IgM antibody test rules out acute HAV infection in an immunocompetent subject.

For determination of immunity or vaccine response 'HAV Ab, Total' is the appropriate test to order

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**
86709

**LOINC Codes:**
13950-1
Hepatitis B Core Antibody, IgM
CORM

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Twice per week
Methodology: Chemiluminescent Immunoassay
Reported: 1-8 days
Additional Information: The antibody found earliest in acute HBV infection, IgM will usually be present during the "window" period after HBsAg production has declined to undetectable levels, often before anti-HBs is measurable. It usually persists for up to 6 months, but may occasionally persist for as long as 24 months, or even remain at detectable levels if active virus replication is continuing with chronic hepatitis B infection.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- HBcAb, IgM
- HBV
- anti-HBc
- anti-HBcAg

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.25 mL serum (this volume is insufficient for repeat testing if needed)
Stability (from collection to initiation):
Refrigerated 6 days

PROCESSING

Test Code: CORM
Test Group: Hepatitis
Performing Lab: Immunology
Specimen Preparation: Refrigerate sample
**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.25 mL serum (this volume is insufficient for repeat testing if needed)

**Stability (from collection to initiation):**
Refrigerated 6 days

### RESULT INTERPRETATION

**Reference Interval:**
Negative

**Additional Information:**
The antibody found earliest in acute HBV infection, IgM will usually be present during the "window" period after HBsAg production has declined to undetectable levels, often before anti-HBs is measurable. It usually persists for up to 6 months, but may occasionally persist for as long as 24 months, or even remain at detectable levels if active virus replication is continuing with chronic hepatitis B infection.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

### ADMINISTRATIVE

**CPT Codes:**
86705

**LOINC Codes:**
5185-4

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
CORM

**Test Group:**
Hepatitis

**Performing Lab:**
Immunology

**Performed:**
Twice per week

**Methodology:**
Chemiluminescent Immunoassay

**Collect:**
Gold top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.25 mL serum (this volume is insufficient for repeat testing if needed)

**Specimen Preparation:**
Refrigerate sample

**Reference Interval:**
Negative
- HBCab, IgM
- HBV
- anti-HBc
- anti-HBcAg

**Stability (from collection to initiation):**
- Refrigerated 6 days

**Reported:**
- 1-8 days

**Additional Information:**

The antibody found earliest in acute HBV infection, IgM will usually be present during the "window" period after HBsAg production has declined to undetectable levels, often before anti-HBs is measurable. It usually persists for up to 6 months, but may occasionally persist for as long as 24 months, or even remain at detectable levels if active virus replication is continuing with chronic hepatitis B infection.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**
  - 86705

**LOINC Codes:**
  - 5185-4
Hepatitis B Core Antibody, Total

ORDERING

Available Stat:
No

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Microparticle Chemiluminescent Immunoassay

Reported:
1-3 days

Additional Information:
A marker of HBV infection at some indefinite time in the past, this assay may be positive when anti-HBs is negative. Although this test can be helpful in implicating a possible viral etiology of unexplained cirrhosis or hepatocellular carcinoma, it has no role in the diagnosis of acute HBV infection.

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- HBCab
- Hep B Core Antibody
- HBCAg
- HBV
- anti-HBC
- anti-HBCAg

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum

Stability (from collection to initiation):
Refrigerated 6 days

PROCESSING

Test Code:
CORE

Test Group:
Hepatitis

Performing Lab:
Immunology
Specimen Preparation:
Refrigerate sample

Preferred Volume:
0.5 mL serum

Stability (from collection to initiation):
Refrigerated 6 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
A marker of HBV infection at some indefinite time in the past, this assay may be positive when anti-HBs is negative. Although this test can be helpful in implicating a possible viral etiology of unexplained cirrhosis or hepatocellular carcinoma, it has no role in the diagnosis of acute HBV infection.

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
86704

LOINC Codes:
16933-4

COMPLETE VIEW

Available Stat:
No

Test Code:
CORE

Test Group:
Hepatitis

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Microparticle Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate sample

Reference Interval:
Negative

Synonyms:
- HBcAb
- Hep B Core Antibody
- HBcAg
- HBV
- anti-HBc
- anti-HBcAg

**Stability (from collection to initiation):**
Refrigerated 6 days

**Reported:**
1-3 days

**Additional Information:**
A marker of HBV infection at some indefinite time in the past, this assay may be positive when anti-HBs is negative. Although this test can be helpful in implicating a possible viral etiology of unexplained cirrhosis or hepatocellular carcinoma, it has no role in the diagnosis of acute HBV infection.

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**
86704

**LOINC Codes:**
16933-4
Hepatitis B DNA, Quantitative

HBVRT

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Methodology:
RT-PCR
Reported:
Performed 1x per week. Turnaround time 3-9 days.
Additional Information:
The use of specimens collected in serum tubes containing Z-clot activator, or similar types of rapid clot activator, may cause inhibited results in the Real Time HBV assay.

High off-scale results are routinely reported as > 1,000,000,000 IU/mL or > 9.0 log IU/mL.

Low level results where HBV DNA is detected by the assay but not quantifiable are reported as Detected with a result <10 IU/mL or <1.00 log IU/mL.

Target Not Detected is reported when no HBV DNA can be detected by the assay. This result should not imply the patient is not infected with HBV. Viral loads less than 10 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

The assay is intended for use as an aid in the management of patients with chronic HBV infection undergoing anti-viral therapy. The assay can be used to measure HBV DNA levels at baseline and during treatment to aid in assessing response to treatment. This assay is not intended for use as a screening test in blood or blood products for HBV or as a diagnostic test to confirm the presence of HBV infection.

Synonyms:
- HBV DNA
- HBV PCR

COLLECTION

Sample Type:
EDTA plasma
Collect:
Pearl White top preferred, Lavender top acceptable
Amount to Collect:
8.5 mL blood
Preferred Volume:
3 mL plasma
Minimum Volume:
1.5 mL plasma
Unacceptable Conditions:
Gold or Red top vacutainer received. Sample not separated from cells within 6 hours of collection.

PROCESSING

Test Code:
HBVRT
Test Group:
Hepatitis
Performing Lab:
Immunology

**Specimen Preparation:**
Centrifuge and freeze Pearl White tube within 6 hours at -70C.

If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70C.

**Preferred Volume:**
3 mL plasma

**Minimum Volume:**
1.5 mL plasma

**Unacceptable Conditions:**
Gold or Red top vacutainer received. Sample not separated from cells within 6 hours of collection.

**RESULT INTERPRETATION**

**Units:**
IU/mL or log IU/mL

**Reference Interval:**
Target not detected (< 10 IU/mL or < 1.00 log IU/mL)

**Additional Information:**
The use of specimens collected in serum tubes containing Z-clot activator, or similar types of rapid clot activator, may cause inhibited results in the Real Time HBV assay.

High off-scale results are routinely reported as > 1,000,000,000 IU/mL or > 9.0 log IU/mL.

Low level results where HBV DNA is detected by the assay but not quantifiable are reported as Detected with a result <10 IU/mL or <1.00 log IU/mL.

Target Not Detected is reported when no HBV DNA can be detected by the assay. This result should not imply the patient is not infected with HBV. Viral loads less than 10 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

The assay is intended for use as an aid in the management of patients with chronic HBV infection undergoing anti-viral therapy. The assay can be used to measure HBV DNA levels at baseline and during treatment to aid in assessing response to treatment. This assay is not intended for use as a screening test in blood or blood products for HBV or as a diagnostic test to confirm the presence of HBV infection.

**ADMINISTRATIVE**

**CPT Codes:**
87517

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
HBVRT

**Test Group:**
Hepatitis

**Performing Lab:**
Immunology

**Methodology:**
RT-PCR

**Collect:**
Pearl White top preferred, Lavender top acceptable

**Amount to Collect:**
8.5 mL blood
Sample Type:
- EDTA plasma

Preferred Volume:
- 3 mL plasma

Minimum Volume:
- 1.5 mL plasma

Unacceptable Conditions:
- Gold or Red top vacutainer received. Sample not separated from cells within 6 hours of collection.

Specimen Preparation:
- Centrifuge and freeze Pearl White tube within 6 hours at -70C.
- If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70C.

Units:
- IU/mL or log IU/mL

Reference Interval:
- Target not detected (< 10 IU/mL or < 1.00 log IU/mL)

Synonyms:
- HBV DNA
- HBV PCR

Reported:
- Performed 1x per week. Turnaround time 3-9 days.

Additional Information:
- The use of specimens collected in serum tubes containing Z-clot activator, or similar types of rapid clot activator, may cause inhibited results in the Real Time HBV assay.

High off-scale results are routinely reported as > 1,000,000,000 IU/mL or > 9.0 log IU/mL.

Low level results where HBV DNA is detected by the assay but not quantifiable are reported as Detected with a result <10 IU/mL or <1.00 log IU/mL.

Target Not Detected is reported when no HBV DNA can be detected by the assay. This result should not imply the patient is not infected with HBV. Viral loads less than 10 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

The assay is intended for use as an aid in the management of patients with chronic HBV infection undergoing anti-viral therapy. The assay can be used to measure HBV DNA levels at baseline and during treatment to aid in assessing response to treatment. This assay is not intended for use as a screening test in blood or blood products for HBV or as a diagnostic test to confirm the presence of HBV infection.

CPT Codes:
- 87517
Hepatitis B e Antibody  
AHBE

ORDERING

Available Stat:
No
Performing Lab:
UC Davis
Methodology:
Microtiter
Reported:
Test run Tuesday. Turnaround time: 2-7 days.
Additional Information:
This test has minimal, if any, clinical value. The presence of antibody to HBeAg suggests that the HBsAg-positive patient is less infectious than an antibody-negative counterpart and less likely to develop chronic liver disease, but these advantages are only relative; HBsAg positive patients are infectious and at risk of hepatic complications regardless of anti-HBe or HBe status.
Synonyms:
- HBeAb
- HBV
- anti-HBe
- anti-HBeAg
- e antibody

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum

PROCESSING

Test Code:
AHBE
Test Group:
Hepatitis
Sendout:
Yes
Performing Lab:
UC Davis
Specimen Preparation:
Refrigerate serum, store in plastic tube. Order UCD Test code HBEAB.
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
This test has minimal, if any, clinical value. The presence of antibody to HBeAg suggests that the HBsAg-positive patient is less infectious than an antibody-negative counterpart and less likely to develop chronic liver disease, but these advantages are only relative; HBsAg positive patients are infectious and at risk of hepatic complications regardless of anti-HBe or HBe status.

ADMINISTRATIVE

CPT Codes:
86707-90
LOINC Codes:
22320-6

COMPLETE VIEW

Available Stat:
No
Test Code:
AHBE
Test Group:
Hepatitis
Performing Lab:
UC Davis
Sendout:
Yes
Methodology:
Microtiter
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Specimen Preparation:
Refrigerate serum, store in plastic tube. Order UCD Test code HBEAB.
Reference Interval:
Negative
Synonyms:
• HBeAb
• HBV
• anti-HBe
• anti-HBeAg
• e antibody
Reported:
Test run Tuesday. Turnaround time: 2-7 days.

Additional Information:

Printed 06/07/19
Test information subject to change
This test has minimal, if any, clinical value. The presence of antibody to HBeAg suggests that the HBsAg-positive patient is less infectious than an antibody-negative counterpart and less likely to develop chronic liver disease, but these advantages are only relative; HBsAg positive patients are infectious and at risk of hepatic complications regardless of anti-HBe or HBe status.

CPT Codes:
86707-90

LOINC Codes:
22320-6
Hepatitis B e Antigen
HBE

ORDERING

Available Stat: No
Performing Lab: UC Davis
Methodology: Microtiter
Reported: Test run Wednesday. Turnaround time: 2-7 days.

Additional Information:
HBeAg is a marker of extensive viral replication found almost exclusively in HBsAg-positive sera (in rare mutants not expressing HBsAg, HBeAg can remain positive. Persistently HBeAg-positive patients are more infectious than HBeAg-individuals, more likely to develop chronic liver disease, have less satisfactory results following liver transplantation, and may be candidates for alpha-interferon therapy.

NOTE: HBIG and HBV vaccine are administered to neonates, intimate contacts and recipients of needle sticks on the basis of HBsAg positivity, even if the mother/index case is HBeAg-negative.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- HBeAg
- HBV
- e antigen
- e Ag

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum

PROCESSING

Test Code: HBE
Test Group: Hepatitis
Sendout: Yes
Performing Lab: UC Davis
Specimen Preparation: Refrigerate serum, store in plastic tube. Order UCD Test code HBEHE.
Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
HBeAg is a marker of extensive viral replication found almost exclusively in HBsAg-positive sera (in rare mutants not expressing HBsAg, HBeAg can remain positive. Persistently HBeAg-positive patients are more infectious than HBeAg-individuals, more likely to develop chronic liver disease, have less satisfactory results following liver transplantation, and may be candidates for alpha-interferon therapy.

NOTE: HBIG and HBV vaccine are administered to neonates, intimate contacts and recipients of needle sticks on the basis of HBsAg positivity, even if the mother/index case is HBeAg-negative.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
87530-90

LOINC Codes:
32178-6

COMPLETE VIEW

Available Stat:
No

Test Code:
HBE

Test Group:
Hepatitis

Performing Lab:
UC Davis

Sendout:
Yes

Methodology:
Microtiter

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Refrigerate serum, store in plastic tube. Order UCD Test code HBEHE.

Reference Interval:
Negative

Synonyms:
- HBeAg
- HBV
- e antigen
- e Ag

Reported:
Test run Wednesday. Turnaround time: 2-7 days.

Additional Information:
HBeAg is a marker of extensive viral replication found almost exclusively in HBsAg-positive sera (in rare mutants not expressing HBsAg, HBeAg can remain positive. Persistently HBeAg-positive patients are more infectious than HBeAg-individuals, more likely to develop chronic liver disease, have less satisfactory results following liver transplantation, and may be candidates for alpha-interferon therapy.

NOTE: HBIG and HBV vaccine are administered to neonates, intimate contacts and recipients of needle sticks on the basis of HBsAg positivity, even if the mother/index case is HBeAg-negative.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
87530-90

LOINC Codes:
32178-6
Hepatitis B Surface Antibody, Quantitative
HBABQ

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday day shift
Methodology:
Microparticle Chemiluminescent Immunoassay
Reported:
1-3 days
Additional Information:
HBsAb is a marker of immunity to HBV infection, either by prior exposure to the virus or immunization with Hepatitis B vaccine. This assay reports the quantitative amount of antiviral antibodies present. Values greater than 10 mIU/mL are considered adequate for protection from viral infection. Results should be interpreted as follows:

NEGATIVE: < 8 mIU/mL
EQUIVOCAL: 8-11 mIU/mL
POSITIVE: >= 12 mIU/mL

Equivocal results may be seen in individuals with adequate immunity; however, clinical correlation is required. All initially equivocal results are repeated in duplicate to confirm. Repeat testing could be performed in individuals with a recent vaccination history.

Synonyms:
- HBsAb
- Hep B Surface Ab
- HBV
- . anti-HBs
- anti-HBsAg
- surface antibody

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Stability (from collection to initiation):
Refrigerated 1 week

PROCESSING

Test Code:
HBABQ
Test Group:
Hepatitis
Performing Lab:
Immunology

Specimen Preparation:
Refrigerate serum

Preferred Volume:
0.5 mL serum

Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Units:
mlU/mL

Reference Interval:
<8 mlU/mL: Not immune
8-11 mlU/mL: Equivocal, questionable immunity
>= 12 mIU/mL: Immune

Additional Information:
HBsAb is a marker of immunity to HBV infection, either by prior exposure to the virus or immunization with Hepatitis B vaccine. This assay reports the quantitative amount of antiviral antibodies present. Values greater than 10 mlU/mL are considered adequate for protection from viral infection. Results should be interpreted as follows:

NEGATIVE: < 8 mlU/mL
EQUIVOCAL: 8-11 mlU/mL
POSITIVE: >= 12 mlU/mL

Equivocal results may be seen in individuals with adequate immunity; however, clinical correlation is required. All initially equivocal results are repeated in duplicate to confirm. Repeat testing could be performed in individuals with a recent vaccination history.

ADMINISTRATIVE

CPT Codes:
86317

COMPLETE VIEW

Available Stat:
No

Test Code:
HBABQ

Test Group:
Hepatitis

Performing Lab:
Immunology

Performed:
Monday-Friday day shift

Methodology:
Microparticle Chemiluminescent Immunoassay

Collect:
Gold top or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate serum

Units:
mlU/mL

Reference Interval:
<8 mlU/mL: Not immune
8-11 mlU/mL: Equivocal, questionable immunity
>= 12 mlU/mL: Immune

Synonyms:
• HBsAb
• Hep B Surface Ab
• HBV
• . anti-HBs
• anti-HBsAg
• surface antibody

Stability (from collection to initiation):
Refrigerated 1 week

Reported:
1-3 days

Additional Information:
HBsAb is a marker of immunity to HBV infection, either by prior exposure to the virus or immunization with Hepatitis B vaccine. This assay reports the quantitative amount of antiviral antibodies present. Values greater than 10 mlU/mL are considered adequate for protection from viral infection. Results should be interpreted as follows:

NEGATIVE: < 8 mlU/mL
EQUIVOCAL: 8-11 mlU/mL
POSITIVE: >= 12 mlU/mL

Equivocal results may be seen in individuals with adequate immunity; however, clinical correlation is required. All initially equivocal results are repeated in duplicate to confirm. Repeat testing could be performed in individuals with a recent vaccination history.

CPT Codes:
86317
Hepatitis B Surface Antigen
HBsAg

ORDERING

Available Stat:
No

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift). Note: confirmatory test is performed Monday & Thursday only.

Methodology:
Microparticle Chemiluminescent Immunoassay

Reported:
1-3 days (Confirmation of positives requires additional 3-5 days)

Additional Information:
HBsAg is the most useful single marker of acute or chronic HBV infection. The distinction between chronic carriage and acute or convalescent carriage can be difficult; chronic carriage is suggested by the absence of IgM anti-HBc, a positive test for Total (and therefore IgG) anti-HBc, and persistence of HBsAg for more than 6 months. A confirmatory test will be automatically be performed on all positive assays (ordered only by Immunology)

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Reflex Testing:
A confirmatory test will automatically be run on all positive specimens at an additional charge.

Synonyms:
- HBsAg
- Hep B surface Ag
- HBV
- Australia antigen
- HAA
- Hepatitis associated antigen
- surface antigen

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum (insufficient for confirmatory testing)

Stability (from collection to initiation):
Refrigerated 6 days

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: HBAG
Test Group: Hepatitis
Performing Lab: Immunology
Specimen Preparation: Refrigerate sample
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum (insufficient for confirmatory testing)
Stability (from collection to initiation): Refrigerated 6 days

RESULT INTERPRETATION

Reference Interval: Negative
Additional Information:
HBsAg is the most useful single marker of acute or chronic HBV infection. The distinction between chronic carriage and acute or convalescent carriage can be difficult; chronic carriage is suggested by the absence of IgM anti-HBc, a positive test for Total (and therefore IgG) anti-HBc, and persistence of HBsAg for more than 6 months. A confirmatory test will be automatically be performed on all positive assays (ordered only by Immunology)

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
87340
LOINC Codes:
5196-1

COMPLETE VIEW

Available Stat: No
Test Code: HBAG
Test Group: Hepatitis
Performing Lab: Immunology
Performed:
Monday-Friday (day shift). Note: confirmatory test is performed Monday & Thursday only.
Methodology:
Microparticle Chemiluminescent Immunoassay
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum (insufficient for confirmatory testing)

Specimen Preparation:
Refrigerate sample

Reference Interval:
Negative

Synonyms:
- HBsAg
- Hep B surface Ag
- HBV
- Australia antigen
- HAA
- Hepatitis associated antigen
- surface antigen

Stability (from collection to initiation):
Refrigerated 6 days

Reported:
1-3 days (Confirmation of positives requires additional 3-5 days)

Reflex Testing:
A confirmatory test will automatically be run on all positive specimens at an additional charge.

Additional Information:
HBsAg is the most useful single marker of acute or chronic HBV infection. The distinction between chronic carriage and acute or convalescent carriage can be difficult; chronic carriage is suggested by the absence of IgM anti-HBc, a positive test for Total (and therefore IgG) anti-HBc, and persistence of HBsAg for more than 6 months. A confirmatory test will be automatically performed on all positive assays (ordered only by Immunology)

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
87340

LOINC Codes:
5196-1
Hepatitis B Virus Drug Resistance & BCP/Precore Mutations
HBVDRG

ORDERING

Available Stat:
   No
Performing Lab:
   Quest
Methodology:
   PCR and Sequencing
Reported:
   10-12 days
Additional Information:
   This test can only be performed reliably on specimens with a viral load of at least 600 IU/mL.
Synonyms:
   ● HBV

COLLECTION

Sample Type:
   Serum, or EDTA plasma
Collect:
   Red top, Gold top, Lavender top
Amount to Collect:
   2 mL blood
Preferred Volume:
   1 mL
Minimum Volume:
   0.3 mL
Remarks:
   This test can only be performed reliably on specimens with a viral load of at least 600 IU/mL. Transport as soon as possible to laboratory for processing
Stability (from collection to initiation):
   Room temperature 3 days, refrigerated 1 week, frozen 1 month.

PROCESSING

Test Code:
   HBVDRG
Test Group:
   HBV
Sendout:
   Yes
Performing Lab:
   Quest
Specimen Preparation:
   Serum: Allow blood to clot, centrifuge and aliquot within 2 hours of collection. Freeze aliquot.
   Plasma: centrifuge and aliquot within 2 hours of collection. Freeze aliquot.
   Transport frozen to China Basin
Preferred Volume:
   1 mL
Minimum Volume: 0.3 mL

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen 1 month.

RESULT INTERPRETATION

Additional Information:
This test can only be performed reliably on specimens with a viral load of at least 600 IU/mL.

ADMINISTRATIVE

CPT Codes:
83891-90, 83894-90, 83900-90, 83904-90, 83912-90

COMPLETE VIEW

Available Stat: No
Test Code: HBVDRG
Test Group: HBV
Performing Lab: Quest
Sendout: Yes
Methodology: PCR and Sequencing
Remarks:
This test can only be performed reliably on specimens with a viral load of at least 600 IU/mL. Transport as soon as possible to laboratory for processing
Collect:
Red top, Gold top, Lavender top
Amount to Collect:
2 mL blood
Sample Type:
Serum, or EDTA plasma
Preferred Volume:
1 mL
Minimum Volume:
0.3 mL
Specimen Preparation:
Serum: Allow blood to clot, centrifuge and aliquot within 2 hours of collection. Freeze aliquot.
Plasma: centrifuge and aliquot within 2 hours of collection. Freeze aliquot.
Transport frozen to China Basin
Synonyms:
• HBV
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen 1 month.
Reported:
10-12 days
Additional Information:
This test can only be performed reliably on specimens with a viral load of at least 600 IU/mL.

**CPT Codes:**
83891-90, 83894-90, 83900-90, 83904-90, 83912-90
Hepatitis C Antibody
HCV

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift).
Methodology: Microparticle Chemiluminescent Immunoassay
Reported: 1-3 days
Additional Information:
Results will be reported as:
NEGATIVE no detectable antibody present, presumed negative
EQUIVOCAL very low level detected, may reflect false positive or early infection, repeat or supplemental testing such as HCV viral load could be performed if clinically indicated
LOW low level antibody detected, CDC guidelines recommend supplemental testing such as HCV viral load
POSITIVE high level antibody detected, most patients are truly positive for HCV infection and supplemental testing is not generally recommended

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).
Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
• Hep C Ab
• HCVAb
• anti-HCV antibody

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.25 mL serum (this volume is insufficient for repeat testing if needed)
Stability (from collection to initiation):
Refrigerated 6 days

PROCESSING

Test Code: HCV
Test Group:
Hepatitis

Performing Lab:
Immunology

Specimen Preparation:
Refrigerate sample

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.25 mL serum (this volume is insufficient for repeat testing if needed)

Stability (from collection to initiation):
Refrigerated 6 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Results will be reported as:
NEGATIVE no detectable antibody present, presumed negative
EQUIVOCAL very low level detected, may reflect false positive or early infection, repeat or supplemental testing such as HCV viral load could be performed if clinically indicated
LOW low level antibody detected, CDC guidelines recommend supplemental testing such as HCV viral load
POSITIVE high level antibody detected, most patients are truly positive for HCV infection and supplemental testing is not generally recommended

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
86803

LOINC Codes:
13955-0

COMPLETE VIEW

Available Stat:
No

Test Code:
HCV

Test Group:
Hepatitis

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift).

Methodology:
Microparticle Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood
Sample Type: Serum

Preferred Volume: 0.5 mL serum

Minimum Volume: 0.25 mL serum (this volume is insufficient for repeat testing if needed)

Specimen Preparation: Refrigerate sample

Reference Interval: Negative

Synonyms:
- Hep C Ab
- HCVAb
- anti-HCV antibody

Stability (from collection to initiation): Refrigerated 6 days

Reported: 1-3 days

Additional Information:

Results will be reported as:
- NEGATIVE: no detectable antibody present, presumed negative
- EQUIVOCAL: very low level detected, may reflect false positive or early infection, repeat or supplemental testing such as HCV viral load could be performed if clinically indicated
- LOW: low level antibody detected, CDC guidelines recommend supplemental testing such as HCV viral load
- POSITIVE: high level antibody detected, most patients are truly positive for HCV infection and supplemental testing is not generally recommended

This test is not FDA approved for donor screening. For pre-transplant donor screen see Pre-Transplant Send out (PTXID).

Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
- 86803

LOINC Codes:
- 13955-0
# Hepatitis C Genotyping

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Microbiology</td>
</tr>
<tr>
<td>Performed:</td>
<td>Every other Wednesday, evening shift</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Multi-probe reverse hybridization (LiPA)</td>
</tr>
<tr>
<td>Reported:</td>
<td>Up to 16 days.</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>Note: This test requires the result of the &quot;Hepatitis C RNA, Quantitative by Real Time PCR (HCVRT)&quot; test therefore both test must be ordered. An interpretation of this test by a laboratory physician will automatically be performed and billed for. In patients diagnosed with hepatitis C virus, genotyping is indicated for prognostic reasons. Patients with certain genotypes are more likely than others to respond to therapy with interferon and ribovirin. Based on analysis of the sequences of the 5' untranslated regions and the core region of the HCV virus genome. There are six major genotypes (1-6) and multiple subtypes. Genotypes/subtypes reported with this assay are 1, 1a, 1b, 1a or 1b, 2, 2a or 2c, 2b, 3, 3a, 3b, 3c, 3k, 4, 4a/4c/4d, 4b, 4e, 4f, 4h, 5a, and 6a or 6b. Genotypes 1, 2 and 3 predominate in western countries and the far east, with types 2 and 3 more likely to respond to therapy with alpha interferon. The assay requires a plasma viral RNA level of at least 1000 IU/mL. If a quantitative HCV test has not been done in the last 90 days, it will be ordered by the laboratory, reported and billed separately. The HCV genotyping order will be canceled/credited by the laboratory if the viral RNA level is &lt; 1000 IU/ml. Consult microbiology if testing at a reference laboratory, by sequencing, is indicated. This test was developed and its performance characteristics determined by the UCSF Clinical Labs. It has not been cleared or approved by the U.S. Food and Drug Administration. Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.</td>
</tr>
</tbody>
</table>

## Synonyms:
- HCV Genotyping

## COLLECTION

| Sample Type: | EDTA Plasma |
| Collect: | Lavender top |
| Amount to Collect: | 4 mL blood |
| Preferred Volume: | 2 mL plasma |
| Minimum Volume: | 0.5 mL plasma |
| Remarks: | Note: This test requires the result of the "Hepatitis C RNA, Quantitative by Real Time PCR (HCVRT)" test therefore both test must be ordered. |
| Unacceptable Conditions: | |

Printed 06/07/19
Test information subject to change
Heparinized samples; Grossly hemolyzed samples; HCV viral load < 1000 copies/mL or no HCV viral load within 90 days of current specimen; Genotyping previously performed.

**PROCESSING**

**Test Code:**
- HCVG

**Test Group:**
- Hepatitis

**Performing Lab:**
- Microbiology

**Specimen Preparation:**
- Separate plasma from cells within 6 hours of collection and freeze at -20°C. Avoid repeated freezing and thawing of specimen.

**Preferred Volume:**
- 2 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- Heparinized samples; Grossly hemolyzed samples; HCV viral load < 1000 copies/mL or no HCV viral load within 90 days of current specimen; Genotyping previously performed.

**RESULT INTERPRETATION**

**Additional Information:**

Note: This test requires the result of the "Hepatitis C RNA, Quantitative by Real Time PCR (HCVRT)" test therefore both test must be ordered.

An interpretation of this test by a laboratory physician will automatically be performed and billed for.

In patients diagnosed with hepatitis C virus, genotyping is indicated for prognostic reasons. Patients with certain genotypes are more likely than others to respond to therapy with interferon and ribovirin.

Based on analysis of the sequences of the 5’ untranslated regions and the core region of the HCV virus genome. There are six major genotypes (1-6) and multiple subtypes. Genotypes/subtypes reported with this assay are 1, 1a, 1b, 1a or 1b, 2, 2a or 2c, 2b, 3, 3a, 3b, 3c, 3k, 4, 4a/4c/4d, 4b, 4e, 4f, 4h, 5a, and 6a or 6b. Genotypes 1, 2 and 3 predominate in western countries and the far east, with types 2 and 3 more likely to respond to therapy with alpha interferon.

The assay requires a plasma viral RNA level of at least 1000 IU/mL. If a quantitative HCV test has not been done in the last 90 days, it will be ordered by the laboratory, reported and billed separately. The HCV genotyping order will be canceled/credited by the laboratory if the viral RNA level is < 1000 IU/ml. Consult microbiology if testing at a reference laboratory, by sequencing, is indicated.

This test was developed and its performance characteristics determined by the UCSF Clinical Labs. It has not been cleared or approved by the U.S. Food and Drug Administration.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**ADMINISTRATIVE**

**CPT Codes:**
- 87902, G0452

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 32286-7

**COMPLETE VIEW**
Available Stat:

No

Test Code:

HCVG

Test Group:

Hepatitis

Performing Lab:

Microbiology

Performed:

Every other Wednesday, evening shift

Methodology:

Multi-probe reverse hybridization (LiPA)

Remarks:

Note: This test requires the result of the "Hepatitis C RNA, Quantitative by Real Time PCR (HCVRT)" test therefore both test must be ordered.

Collect:

Lavender top

Amount to Collect:

4 mL blood

Sample Type:

EDTA Plasma

Preferred Volume:

2 mL plasma

Minimum Volume:

0.5 mL plasma

Unacceptable Conditions:

Heparinized samples; Grossly hemolized samples; HCV viral load < 1000 copies/mL or no HCV viral load within 90 days of current specimen; Genotyping previously performed.

Specimen Preparation:

Separate plasma from cells within 6 hours of collection and freeze at -20°C. Avoid repeated freezing and thawing of specimen.

Synonyms:

HCV Genotyping

Reported:

Up to 16 days.

Additional Information:

Note: This test requires the result of the "Hepatitis C RNA, Quantitative by Real Time PCR (HCVRT)" test therefore both test must be ordered.

An interpretation of this test by a laboratory physician will automatically be performed and billed for.

In patients diagnosed with hepatitis C virus, genotyping is indicated for prognostic reasons. Patients with certain genotypes are more likely than others to respond to therapy with interferon and ribovirin.

Based on analysis of the sequences of the 5’ untranslated regions and the core region of the HCV virus genome. There are six major genotypes (1-6) and multiple subtypes. Genotypes/subtypes reported with this assay are 1, 1a, 1b, 1a or 1b, 2, 2a or 2c, 2b, 3, 3a, 3b, 3c, 3k, 4, 4a/4c/4d, 4b, 4e, 4f, 4h, 5a, and 6a or 6b. Genotypes 1, 2 and 3 predominate in western countries and the far east, with types 2 and 3 more likely to respond to therapy with alpha interferon.

The assay requires a plasma viral RNA level of at least 1000 IU/mL. If a quantitative HCV test has not been done in the last 90 days, it will be ordered by the laboratory, reported and billed separately. The HCV genotyping order will be canceled/credited by the laboratory if the viral RNA level is < 1000 IU/ml. Consult microbiology if testing at a reference laboratory, by sequencing, is indicated.

This test was developed and its performance characteristics determined by the UCSF Clinical Labs. It has not been cleared or approved by the U.S. Food and Drug Administration.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
87902, G0452

LDT or Modified FDA:
Yes

LOINC Codes:
32286-7
Hepatitis C RNA, Quantitative
HCVRT

ORDERING

Available Stat: No
Performing Lab: Immunology
Methodology: RT-PCR
Reported: Performed once per week. Turnaround time 3-9 days

Additional Information:
- High off-scale results are routinely reported as > 100,000,000 IU/mL or > 8.0 log IU/mL.
- Low level results where HCV RNA is detected by the assay but not quantifiable are reported as Detected with a result <12 IU/mL or <1.08 log IU/mL.
- Target Not Detected is reported when no HCV RNA can be detected by the assay. This result should not imply the patient is not infected with HCV. Viral loads less than 12 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.
- This test may be used as a marker for the effect of interferon or other therapy, but should not be used for diagnosis without confirmation by other established means. Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- Hepatitis C RNA, Qualitative, PCR
- Hepatitis C RNA, Quantitative, PCR
- HCV
- Hepatitis C RNA, Quantitative by B-DNA

COLLECTION

Sample Type: EDTA Plasma
Collect: Pearl White top preferred, Lavender top acceptable
Amount to Collect: 8.5 mL blood
Preferred Volume: 3 mL plasma
Minimum Volume: 1.5 mL plasma
Remarks: Transport to laboratory as soon as possible after collection. Sample needs to be processed within 6 hours.

Stability (from collection to initiation):
Room temperature 6 hours

PROCESSING

Test Code: HCVRT
Test Group: Hepatitis
Performing Lab:
  Immunology

Specimen Preparation:
  Centrifuge and freeze Pearl White tube within 6 hours at -70°C.

If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70°C.

Preferred Volume:
  3 mL plasma

Minimum Volume:
  1.5 mL plasma

Stability (from collection to initiation):
  Room temperature 6 hours

RESULT INTERPRETATION

Units:
  IU/mL and log IU/mL

Reference Interval:
  Target not detected (< 12 IU/mL or < 1.08 log IU/mL)

Additional Information:
  High off-scale results are routinely reported as > 100,000,000 IU/mL or > 8.0 log IU/mL.

  Low level results where HCV RNA is detected by the assay but not quantifiable are reported as Detected with a result <12 IU/mL or <1.08 log IU/mL.

  Target Not Detected is reported when no HCV RNA can be detected by the assay. This result should not imply the patient is not infected with HCV. Viral loads less than 12 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

  This test may be used as a marker for the effect of interferon or other therapy, but should not be used for diagnosis without confirmation by other established means. Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
  87522

COMPLETE VIEW

Available Stat:
  No

Test Code:
  HCVRT

Test Group:
  Hepatitis

Performing Lab:
  Immunology

Methodology:
  RT-PCR

Remarks:
  Transport to laboratory as soon as possible after collection. Sample needs to be processed within 6 hours.

Collect:
  Pearl White top preferred, Lavender top acceptable

Amount to Collect:
  8.5 mL blood
Sample Type:
EDTA Plasma

Preferred Volume:
3 mL plasma

Minimum Volume:
1.5 mL plasma

Specimen Preparation:
Centrifuge and freeze Pearl White tube within 6 hours at -70C.

If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70C.

Units:
IU/mL and log IU/mL

Reference Interval:
Target not detected (< 12 IU/mL or < 1.08 log IU/mL)

Synonyms:
- Hepatitis C RNA, Qualitative, PCR
- Hepatitis C RNA, Quantitative, PCR
- HCV
- Hepatitis C RNA, Quantitative by B-DNA

Stability (from collection to initiation):
Room temperature 6 hours

Reported:
Performed once per week. Turnaround time 3-9 days

Additional Information:
High off-scale results are routinely reported as > 100,000,000 IU/mL or > 8.0 log IU/mL.

Low level results where HCV RNA is detected by the assay but not quantifiable are reported as Detected with a result <12 IU/mL or < 1.08 log IU/mL.

Target Not Detected is reported when no HCV RNA can be detected by the assay. This result should not imply the patient is not infected with HCV. Viral loads less than 12 IU/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

This test may be used as a marker for the effect of interferon or other therapy, but should not be used for diagnosis without confirmation by other established means. Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
87522
Hepatitis D Antibody
HDV

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test run Wednesday & Friday. Turnaround time: 2-7 days.

Additional Information:
Anti-HDV is a marker for acute or persisting infection with the "delta" agent, a defective RNA virus which can only infect HBV-infected patients. Combined HBV-HDV infection may be more severe than HBV infection alone. Antibody to HDV ordinarily persists for about 6 months following acute infection; detection beyond that point is evidence that the patient has become a carrier. Clinical use is to diagnose hepatitis delta virus (HDV) infection in patients with fulminant hepatic failure, or known previous HBV infection. A positive HDV antibody test, along with the presence of HbsAg, indicates HBV/HDV coinfection

Synonyms:
- Delta Antibody
- HDV Ab
- anti-HDV antibody
- Delta agent
- Delta antibody

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month, frozen at -70C indefinite.

Unacceptable Conditions:
Plasma samples

PROCESSING

Test Code:
HDV
Test Group:
Hepatitis
Sendout:
Yes
Performing Lab:
Quest

Printed 06/07/19
Test information subject to change
Specimen Preparation:
Freeze serum at -20C. Deliver serum to immunology, who will forward the specimen to the sendout desk where appropriate. Order Nichols # 4990X.

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Plasma samples

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month, frozen at -70C indefinite.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Anti-HDV is a marker for acute or persisting infection with the "delta" agent, a defective RNA virus which can only infect HBV-infected patients. Combined HBV-HDV infection may be more severe than HBV infection alone. Antibody to HDV ordinarily persists for about 6 months following acute infection; detection beyond that point is evidence that the patient has become a carrier. Clinical use is to diagnose hepatitis delta virus (HDV) infection in patients with fulminant hepatic failure, or known previous HBV infection. A positive HDV antibody test, along with the presence of HbsAg, indicates HBV/HDV coinfection

ADMINISTRATIVE

CPT Codes:
86692-90
LOINC Codes:
40727-0

COMPLETE VIEW

Available Stat:
No
Test Code:
HDV
Test Group:
Hepatitis
Performing Lab:
Quest
Sendout:
Yes
Methodology:
EIA
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Plasma samples

Specimen Preparation:
Freeze serum at -20C. Deliver serum to immunology, who will forward the specimen to the sendout desk where appropriate. Order Nichols # 4990X.

Reference Interval:
Negative

Synonyms:
- Delta Antibody
- HDV Ab
- anti-HDV antibody
- Delta agent
- Delta antibody

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month, frozen at -70C indefinite.

Reported:
Test run Wednesday & Friday. Turnaround time: 2-7 days.

Additional Information:
Anti-HDV is a marker for acute or persisting infection with the "delta" agent, a defective RNA virus which can only infect HBV-infected patients. Combined HBV-HDV infection may be more severe than HBV infection alone. Antibody to HDV ordinarily persists for about 6 months following acute infection; detection beyond that point is evidence that the patient has become a carrier. Clinical use is to diagnose hepatitis delta virus (HDV) infection in patients with fulminant hepatic failure, or known previous HBV infection. A positive HDV antibody test, along with the presence of HbsAg, indicates HBV/HDV coinfection

CPT Codes:
86692-90

LOINC Codes:
40727-0
## Hepatitis D RNA, Qualitative

### ORDERING

**Ordering Recommendations:**
- Should only be ordered in patient who are Hepatitis B surface Antigen positive.

**Performing Lab:**
- Focus

**Methodology:**
- PCR

**Reported:**
- 3-5 days

**Additional Information:**
- Hepatitis D Virus (HDV) is an RNA virus whose transmission is dependent on associated hepatitis B viral infection.

**Synonyms:**
- HDV

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 1.5 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 1 week, frozen 1 month

### PROCESSING

**Test Code:**
- HDVR

**Sendout:**
- Yes

**Performing Lab:**
- Focus

**Specimen Preparation:**
- Aliquot and freeze. Transport to CB frozen. Order Quest test code 34469.

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 1 week, frozen 1 month

### RESULT INTERPRETATION

**Reference Interval:**
Hepatitis D Virus (HDV) is an RNA virus whose transmission is dependent on associated hepatitis B viral infection.

**ADMINISTRATIVE**

CPT Codes:
- 87798-90

**COMPLETE VIEW**

**Ordering Recommendations:**
Should only be ordered in patient who are Hepatitis B surface Antigen positive.

**Test Code:**
- HDVR

**Performing Lab:**
- Focus

**Sendout:**
- Yes

**Methodology:**
- PCR

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 1.5 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Specimen Preparation:**
- Aliquot and freeze. Transport to CB frozen. Order Quest test code 34469.

**Reference Interval:**
- Not detected

**Synonyms:**
- HDV

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 1 week, frozen 1 month

**Reported:**
- 3-5 days

**Additional Information:**
- Hepatitis D Virus (HDV) is an RNA virus whose transmission is dependent on associated hepatitis B viral infection.

**CPT Codes:**
- 87798-90
Hepatitis E Antibody, IgM
HEVM

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test performed Monday and Thursday. Turnaround time: 2-5 days.

Additional Information:
Hepatitis E Virus (HEV) is a major cause of enteric non-A hepatitis worldwide. HEV IgM is typically detected within 2-4 weeks after infection, and then declines rapidly during convalescence.

This test was performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Focus Diagnostics. This test should not be used for diagnosis without confirmation by other medically established means.

Synonyms:
- HEV

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code:
HEVM
Test Group:
Hepatitis
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Serum should be removed from cells promptly after collection and transferred to a plastic tube. Freeze serum at -20C. Order Quest # 36582X

Preferred Volume:
0.5 mL serum
Minimum Volume:
0.1 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

RESULT INTERPRETATION

Reference Interval:
Not detected

Additional Information:
Hepatitis E Virus (HEV) is a major cause of enteric non-A hepatitis worldwide. HEV IgM is typically detected within 2-4 weeks after infection, and then declines rapidly during convalescence.

This test was performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Focus Diagnostics. This test should not be used for diagnosis without confirmation by other medically established means.

ADMINISTRATIVE

CPT Codes:
86790-90

LOINC Codes:
14212-5

COMPLETE VIEW

Available Stat:
No

Test Code:
HEVM

Test Group:
Hepatitis

Performing Lab:
Quest

Sendout:
Yes

Methodology:
EIA

Collect:
Gold top, Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Serum should be removed from cells promptly after collection and transferred to a plastic tube. Freeze serum at -20°C. Order Quest # 36582X

Reference Interval:
Not detected

Synonyms:
• HEV

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.
Reported:
Test performed Monday and Thursday. Turnaround time: 2-5 days.

Additional Information:
Hepatitis E Virus (HEV) is a major cause of enteric non-A hepatitis worldwide. HEV IgM is typically detected within 2-4 weeks after infection, and then declines rapidly during convalescence.

This test was performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Focus Diagnostics. This test should not be used for diagnosis without confirmation by other medically established means.

CPT Codes:
86790-90

LOINC Codes:
14212-5
HEPTEG

ORDERING

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.

Performing Lab:
Mission Bay Hematology

Performed:
By appointment only, 0800-1530 daily

Reported:
2 hours

Additional Information:
Patient has to be on a heparinized line at the time of draw.

Synonyms:
- Hep Thromboelastograph

COLLECTION

Sample Type:
Citrated Whole Blood

Collect:
Citrated Blue Top

Amount to Collect:
2.7 ml

Preferred Volume:
2.7 ml

Minimum Volume:
2.7 ml

Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology laboratory.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

PROCESSING

Test Code:
HEPTEG

Performing Lab:
Mission Bay Hematology

Preferred Volume:
2.7 ml
Minimum Volume:
2.7 ml

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

RESULT INTERPRETATION

Units:
R (min)  K (min)  Angle (deg)  MA (mm)

Reference Interval:
ADULT NORMAL VALUES: HEPTEG

<table>
<thead>
<tr>
<th>R (min)</th>
<th>K (min)</th>
<th>Angle (deg)</th>
<th>MA (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0-10.4</td>
<td>0.8-2.8</td>
<td>55.2-78.4</td>
<td>50.6-69.4</td>
</tr>
</tbody>
</table>

The thrombelastograph has been cleared by the U.S. FDA as a medical device indicated for use with adult patients where an evaluation of their blood coagulation properties is desired. The use of TEG in pediatric patients has not been cleared by the FDA. The performance characteristics of the test were assessed by the UCSF Clinical Laboratories.

Additional Information:
Patient has to be on a heparinized line at the time of draw.

ADMINISTRATIVE

CPT Codes:
85347, 85384, 85576, 85390

LOINC Codes:
69552-8

COMPLETE VIEW

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.

Test Code:
HEPTEG

Performing Lab:
Mission Bay Hematology

Performed:
By appointment only, 0800-1530 daily

Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology laboratory.

Collect:
Citrated Blue Top

Amount to Collect:
2.7 ml

Sample Type:
Citrated Whole Blood

Preferred Volume:
2.7 ml

Minimum Volume:
2.7 ml

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

Units:
R (min)    K (min)    Angle (deg)    MA (mm)

Reference Interval:
ADULT NORMAL VALUES: HEPTEG

<table>
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The thrombelastograph has been cleared by the U.S. FDA as a medical device indicated for use with adult patients where an evaluation of their blood coagulation properties is desired. The use of TEG in pediatric patients has not been cleared by the FDA. The performance characteristics of the test were assessed by the UCSF Clinical Laboratories.

Synonyms:
- Hep Thromboelastograph

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Reported:
2 hours

Additional Information:
Patient has to be on a heparinized line at the time of draw.

CPT Codes:
85347, 85384, 85576, 85390

LOINC Codes:
69552-8
Hereditary Spherocytosis Evaluation
HSEP

ORDERING

Available Stat: 
No
Performing Lab: 
Mayo
Methodology: 
Osmotic lysis and flow cytometry
Reported: 
4-7 days

Additional Information:
The hemolytic anemias are a group of anemias that are characterized by an increased destruction of RBCs. Anemias may be divided into inherited or acquired. Hereditary spherocytosis (HS), also known as congenital hemolytic anemia, is inherited as a non sex-linked dominant trait. HS is caused by a RBC membrane defect. The RBCs are spherocytic in shape and show an increased rate of destruction. HS can result from abnormalities involving several red cell membrane proteins, such as band 3, spectrin, and ankyrin.

Most often HS is diagnosed in childhood, adolescence, or early adult life. The diagnosis of HS is usually made by a combination of patient and family history, laboratory evidence of hemolysis, and review of a peripheral blood smear. The osmotic fragility test is usually markedly abnormal in these cases. However, factors such as age, sex, and medications can affect the osmotic fragility test.

This evaluation combines osmotic fragility testing with a newly developed flow cytometry assay to provide complementary information in the evaluation of patients with suspected HS.

Reflex Testing: 
If indicated based on osmotic lysis results flow cytometry is performed as an additional step in the evaluation and charged separately

Synonyms: 
- HS 
- ektacytometry 
- EKTA 
- hemolytic anemia 
- spherocytes 
- Red Cell Osmotic fragility

COLLECTION

Patient Preparation: 
Recent transfusion, oral contraceptive use and H2 blocker use may interfere with test results.

Sample Type: 
EDTA Whole blood
Collect: 
Lavender top

Amount to Collect: 
5 mL blood
Preferred Volume: 
5 mL blood
Minimum Volume: 
2 mL blood
Remarks: 
A control specimen is required from an unrelated, normal, non-smoking individual. Draw control at the same time as the patient sample. Clearly mark the control sample with 'CONTROL' and the sex of the individual providing the control sample on the label.

Refrigerate samples immediately after collection and transport cold to the lab.
Stability (from collection to initiation):
Refrigerated 4 days

Rejection Criteria:
Samples received > 96 hours after collection

PROCESSING

Test Code:
HSEP
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Refrigerate immediately after collection. Maintain refrigerated and transport both patient sample and control sample to CB. Order Mayo test code HSEP.
Preferred Volume:
5 mL blood
Minimum Volume:
2 mL blood
Rejection Criteria:
Samples received > 96 hours after collection
Stability (from collection to initiation):
Refrigerated 4 days

RESULT INTERPRETATION

Units:
% hemolysis and interpretive report

Reference Interval:
0.50 g/dL NaCl (unincubated)
Males 0.0-47.8% hemolysis
Females 0.0-31.1% hemolysis

0.60 g/dL NaCl (incubated)
Males 18.7-67.4% hemolysis
Females 10.9-65.5% hemolysis

0.65 g/dL NaCl (incubated)
Males 4.4-36.6% hemolysis
Females 0.2-39.3% hemolysis

0.75 g/dL NaCl (incubated)
Males 0.8-9.1% hemolysis
Females 0.0-10.9% hemolysis

Additional Information:
The hemolytic anemias are a group of anemias that are characterized by an increased destruction of RBCs. Anemias may be divided into inherited or acquired. Hereditary spherocytosis (HS), also known as congenital hemolytic anemia, is inherited as a non sex-linked dominant trait. HS is caused by a RBC membrane defect. The RBCs are spherocytic in shape and show an increased rate of destruction. HS can result from abnormalities involving several red cell membrane proteins, such as band 3, spectrin, and ankyrin.

Most often HS is diagnosed in childhood, adolescence, or early adult life. The diagnosis of HS is usually made by a combination of patient and family history, laboratory evidence of hemolysis, and review of a peripheral blood smear. The osmotic fragility test is usually markedly abnormal in these cases. However, factors such as age, sex, and medications can affect the osmotic fragility test.

This evaluation combines osmotic fragility testing with a newly developed flow cytometry assay to provide complementary information in
the evaluation of patients with suspected HS.

**ADMINISTRATIVE**

CPT Codes:
85557-90, 88184-90

**COMPLETE VIEW**

Available Stat:
No

Test Code:
HSEP

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Osmotic lysis and flow cytometry

Patient Preparation:
Recent transfusion, oral contraceptive use and H2 blocker use may interfere with test results.

Remarks:
A control specimen is required from an unrelated, normal, non-smoking individual. Draw control at the same time as the patient sample. Clearly mark the control sample with 'CONTROL' and the sex of the individual providing the control sample on the label.

Refrigerate samples immediately after collection and transport cold to the lab.

Collect:
Lavender top

Amount to Collect:
5 mL blood

Sample Type:
EDTA Whole blood

Preferred Volume:
5 mL blood

Minimum Volume:
2 mL blood

Rejection Criteria:
Samples received > 96 hours after collection

Specimen Preparation:
Refrigerate immediately after collection. Maintain refrigerated and transport both patient sample and control sample to CB. Order Mayo test code HSEP.

Units:
% hemolysis and interpretive report

Reference Interval:

0.50 g/dL NaCl (unincubated)
Males 0.0-47.8% hemolysis
Females 0.0-31.1% hemolysis

0.60 g/dL NaCl (incubated)
Males 18.7-67.4% hemolysis
Females 10.9-65.5% hemolysis

0.65 g/dL NaCl (incubated)
Males 4.4-36.6% hemolysis
Females 0.2-39.3% hemolysis
0.75 g/dL NaCl (incubated)
Males  0.8-9.1% hemolysis
Females 0.0-10.9% hemolysis

Synonyms:
- HS
- ektacytometry
- EKTA
- hemolytic anemia
- spherocytes
- Red Cell Osmotic fragility

Stability (from collection to initiation):
Refrigerated 4 days

Reported:
4-7 days

Reflex Testing:
If indicated based on osmotic lysis results flow cytometry is performed as an additional step in the evaluation and charged separately

Additional Information:
The hemolytic anemias are a group of anemias that are characterized by an increased destruction of RBCs. Anemias may be divided into inherited or acquired. Hereditary spherocytosis (HS), also known as congenital hemolytic anemia, is inherited as a non sex-linked dominant trait. HS is caused by a RBC membrane defect. The RBCs are spherocytic in shape and show an increased rate of destruction. HS can result from abnormalities involving several red cell membrane proteins, such as band 3, spectrin, and ankyrin.

Most often HS is diagnosed in childhood, adolescence, or early adult life. The diagnosis of HS is usually made by a combination of patient and family history, laboratory evidence of hemolysis, and review of a peripheral blood smear. The osmotic fragility test is usually markedly abnormal in these cases. However, factors such as age, sex, and medications can affect the osmotic fragility test.

This evaluation combines osmotic fragility testing with a newly developed flow cytometry assay to provide complementary information in the evaluation of patients with suspected HS.

CPT Codes:
85557-90, 88184-90
Herpes Simplex 1,2 Antibody, IgG
HSVP

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday - Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1 - 4 days
Synonyms:
- HSV 1,2 Ab
- HSV IgG
- TORCH antibodies

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

PROCESSING

Test Code: HSVP
Test Group: Herpes
Performing Lab: Immunology
Specimen Preparation: Freeze sample at -20C
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

RESULT INTERPRETATION

Reference Interval: Negative
ADMINISTRATIVE

CPT Codes:
51916-5, 43180-9

LOINC Codes:
36921-5

COMPLETE VIEW

Available Stat:
No

Test Code:
HSVP

Test Group:
Herpes

Performing Lab:
Immunology

Performed:
Monday - Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze sample at -20C

Reference Interval:
Negative

Synonyms:
- HSV 1,2 Ab
- HSV IgG
- TORCH antibodies

Reported:
1 - 4 days

CPT Codes:
51916-5, 43180-9

LOINC Codes:
36921-5
Herpes simplex 1,2 virus Antibody, IgM
HSVM12

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunofluorescence
Reported:
3 - 5 days
Reflex Testing:
Titors are performed automatically on all positive samples and charged for.
Synonyms:
• HSV 1,2 Ab
• HSV IgM
• TORCH antibodies

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.
Unacceptable Conditions:
Gross hemolysis or gross lipemia
Rejection Criteria:
Gross hemolysis or gross lipemia

PROCESSING

Test Code:
HSVM12
Test Group:
Herpes
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Allow sample to clot fully at room temperature before centrifugation. Aliquot and refrigerate serum. Order Quest test code 90849.
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Gross hemolysis or gross lipemia

Rejection Criteria:
Gross hemolysis or gross lipemia

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

RESULT INTERPRETATION

Units:
Titer

Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
86695-90, 86696-90

COMPLETE VIEW

Available Stat:
No

Test Code:
HSVM12

Test Group:
Herpes

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunofluorescence

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Rejection Criteria:
Gross hemolysis or gross lipemia

Unacceptable Conditions:
Gross hemolysis or gross lipemia

Specimen Preparation:
Allow sample to clot fully at room temperature before centrifugation. Aliquot and refrigerate serum. Order Quest test code 90849.

Units:
Titer

Reference Interval:
Negative

**Synonyms:**
- HSV 1,2 Ab
- HSV IgM
- TORCH antibodies

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

**Reported:**
- 3 - 5 days

**Reflex Testing:**
- Titers are performed automatically on all positive samples and charged for.

**CPT Codes:**
- 86695-90, 86696-90
Herpes Simplex Virus Culture with Reflex to HSV Typing

P319

ORDERING

Ordering Recommendations:
Detect herpes simplex virus (HSV) by viral culture and differentiate types 1 and 2. Molecular testing is generally preferred; refer to Herpes Simplex Virus (HSV-1/HSV-2) Subtype by PCR (2010095).

Approval Required:
Yes, consult with Microbiology Director x3-1628

Available Stat:
No

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Cell Culture/Immunoassay

Reported:
1-7 days

Synonyms:
- Drug susceptibility testing
- HSV
- Antiviral susceptibility testing
- Acyclovir
- Foscarnet
- Herpes Culture
- Herpes Simplex Viral Culture
- HSV type 1
- HSV type 2
- HSV-1 or HSV-2
- HSV1 and HSV2

COLLECTION

Collect:
Buccal mucosa, eye, genital, rectal, throat or vesicle swab, or bronchoalveolar lavage, tissue or vesicle fluid.

Remarks:
Specimen source preferred.

Stability (from collection to initiation):
Ambient: 2 hours; Refrigerated: 72 hours; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Blood, CSF, plasma, or serum. Calcium alginate, eSwab, dry, or wood swabs.

PROCESSING

Test Code:
P319

Test Group:
Herpes

**ARUP Test Code:**
0065065

**Sendout:**
Yes

**Performing Lab:**
ARUP

**Specimen Preparation:**
- Fluid: Transfer 3 mL specimen to a sterile container. (Min: 0.5 mL) Also acceptable: Transfer to 3 mL viral transport media (ARUP Supply #12884) available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787.
- Swab or Tissue: Place in 3 mL viral transport media (ARUP Supply #12884) available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787.

**Unacceptable Conditions:**
- Blood, CSF, plasma, or serum. Calcium alginate, eSwab, dry, or wood swabs.

**Stability (from collection to initiation):**
- Ambient: 2 hours; Refrigerated: 72 hours; Frozen: Unacceptable

**Storage/Transport Temperature:**
- Refrigerated.

**RESULT INTERPRETATION**

**Reference Interval:**
- Culture negative for herpes simplex virus.

**ADMINISTRATIVE**

**CPT Codes:**
- 87252: 87253; if reflexed, add 87140 x2

**LOINC Codes:**
- Culture: 16291-7
- Acyclovir: 73574-6, 9416-9
- Foscarnet: 42317-8

**COMPLETE VIEW**

**Approval Required:**
- Yes, consult with Microbiology Director x3-1628

**Available Stat:**
- No

**Ordering Recommendations:**
- Detect herpes simplex virus (HSV) by viral culture and differentiate types 1 and 2. Molecular testing is generally preferred; refer to Herpes Simplex Virus (HSV-1/HSV-2) Subtype by PCR (2010095).

**Test Code:**
- P319

**Test Group:**
- Herpes

**ARUP Test Code:**
- 0065065

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Sun-Sat

**Methodology:**
- Cell Culture/Immunoassay

**Remarks:**
- Printed 06/07/19
- Test information subject to change
Specimen source preferred.

**Collect:**
- Buccal mucosa, eye, genital, rectal, throat or vesicle swab, or bronchoalveolar lavage, tissue or vesicle fluid.

**Unacceptable Conditions:**
- Blood, CSF, plasma, or serum. Calcium alginate, eSwab, dry, or wood swabs.

**Specimen Preparation:**
- Fluid: Transfer 3 mL specimen to a sterile container. (Min: 0.5 mL) Also acceptable: Transfer to 3 mL viral transport media (ARUP Supply #12884) available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787.
- Swab or Tissue: Place in 3 mL viral transport media (ARUP Supply #12884) available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787.

**Reference Interval:**
- Culture negative for herpes simplex virus.

**Synonyms:**
- Drug susceptibility testing
- HSV
- Antiviral susceptibility testing
- Acyclovir
- Foscarnet
- Herpes Culture
- Herpes Simplex Viral Culture
- HSV type 1
- HSV type 2
- HSV-1 or HSV-2
- HSV1 and HSV2

**Storage/Transport Temperature:**
- Refrigerated.

**Stability (from collection to initiation):**
- Ambient: 2 hours; Refrigerated: 72 hours; Frozen: Unacceptable

**Reported:**
- 1-7 days

**CPT Codes:**
- 87252; 87253; if reflexed, add 87140 x2

**LOINC Codes:**
- Culture: 16291-7 Acyclovir: 73574-6, 9416-9 Foscarnet: 42317-8

**Notes:**
- If culture is positive for HSV, then HSV typing test will be added. Additional charges apply.

Herpes Simplex Virus by PCR (ARUP test code 0060041) on CSF specimens is standard of care for diagnosing HSV meningitis/meningoencephalitis.
Herpes simplex virus, DNA, Quantitative
P319, P337

ORDERING

Ordering Recommendations:
For testing of CSF, order Rapid HSV DNA, CSF.
For testing of blood, order Rapid HSV DNA, skin lesion / blood.

Quantification can be performed on positive samples by ordering add-on Herpes Simplex Virus PCR, Quantitative test.

Available Stat:
No

Performing Lab:
- Amniotic fluid: Focus Diagnostics
- Other samples: Viracor

Methodology:
Real time PCR

Reported:
2-5 days

Additional Information:
HSV is a etiologic agent of encephalitis and aseptic meningitis as well as a wide variety of other infections. PCR for HSV in CNS disease is highly sensitive, whereas culture is often negative. This assay differentiates between HSV-1 and HSV-2.

This test has not been cleared or approved by the U.S. Food and Drug Administration. It was developed and its performance characteristics have been determined by the performing laboratory.

Synonyms:
- HSV
- PCR

COLLECTION

Sample Type:
CSF, amniotic fluid, EDTA plasma

Collect:
- CSF or Amniotic fluid: Sterile tube
- Blood: Lavender top

Amount to Collect:
- CSF or Amniotic fluid: 1 mL
- Blood: 3 mL

Preferred Volume:
- CSF or Amniotic fluid: 1 mL
- Plasma: 1 mL

Minimum Volume:
- CSF or Amniotic fluid: 0.5 mL
- Plasma: 0.5 mL

Stability (from collection to initiation):
- CSF and amniotic fluid: Frozen at -70C 1 month
- Plasma: Room temperature 4 days, frozen at -70C 1 month

PROCESSING

Test Code:
- Amniotic fluid: P319
- Other samples: P337

Test Group:
Herpes

Sendout: Yes

Performing Lab:
- Amniotic fluid: Focus Diagnostics
- Other samples: Viracor

Specimen Preparation:
- Test sent out and reported by Microbiology.
- CSF and amniotic fluid: Store at -70°C. Ship frozen on dry ice.
- Blood: Centrifuge blood, remove plasma, and freeze at -70C. Ship frozen on dry ice.
- CSF and plasma: Send to Viracor for HSV1 and HSV2 Real time qPCR #8500
  Amniotic fluid: Send to Focus for Herpes Simplex Virus, Type 1 & 2 DNA, Quantitative Real-Time PCR # 43220

Preferred Volume:
- CSF or Amniotic fluid: 1 mL
- Plasma: 1 mL

Minimum Volume:
- CSF or Amniotic fluid: 0.5 mL
- Plasma: 0.5 mL

Stability (from collection to initiation):
- CSF and amniotic fluid: Frozen at -70C 1 month
- Plasma: Room temperature 4 days, frozen at -70C 1 month

RESULT INTERPRETATION

Units:
- copies/mL

Reference Interval:
- Not detected

Additional Information:
- HSV is a etiologic agent of encephalitis and aseptic meningitis as well as a wide variety of other infections. PCR for HSV in CNS disease is highly sensitive, whereas culture is often negative. This assay differentiates between HSV-1 and HSV-2.

- This test has not been cleared or approved by the U.S. Food and Drug Administration. It was developed and its performance characteristics have been determined by the performing laboratory.

ADMINISTRATIVE

CPT Codes:
- 87530-90 x2

LOINC Codes:
- 5014-6

COMPLETE VIEW

Available Stat:
- No

Ordering Recommendations:
- For testing of CSF, order Rapid HSV DNA, CSF.
- For testing of blood, order Rapid HSV DNA, skin lesion / blood.

- Quantification can be performed on positive samples by ordering add-on Herpes Simplex Virus PCR, Quantitative test.

Test Code:
- Amniotic fluid: P319
Other samples: P337

**Test Group:**
Herpes

**Performing Lab:**
Amniotic fluid: Focus Diagnostics
Other samples: Viracor

**Sendout:**
Yes

**Methodology:**
Real time PCR

**Collect:**
CSF or Amniotic fluid: Sterile tube
Blood: Lavender top

**Amount to Collect:**
CSF or Amniotic fluid: 1 mL
Blood: 3 mL

**Sample Type:**
CSF, amniotic fluid, EDTA plasma

**Preferred Volume:**
CSF or Amniotic fluid: 1 mL
Plasma: 1 mL

**Minimum Volume:**
CSF or Amniotic fluid: 0.5 mL
Plasma: 0.5 mL

**Specimen Preparation:**
Test sent out and reported by Microbiology.

CSF and amniotic fluid: Store at -70°C. Ship frozen on dry ice.

Blood: Centrifuge blood, remove plasma, and freeze at -70°C. Ship frozen on dry ice.

CSF and plasma: Send to Viracor for HSV1 and HSV2 Real time qPCR #8500

Amniotic fluid: Send to Focus for Herpes Simplex Virus, Type 1 & 2 DNA, Quantitative Real-Time PCR # 43220

**Units:**
copies/mL

**Reference Interval:**
Not detected

**Synonyms:**
- HSV
- PCR

**Stability (from collection to initiation):**
CSF and amniotic fluid: Frozen at -70°C 1 month
Plasma: Room temperature 4 days, frozen at -70°C 1 month

**Reported:**
2-5 days

**Additional Information:**
HSV is a etiologic agent of encephalitis and aseptic meningitis as well as a wide variety of other infections. PCR for HSV in CNS disease is highly sensitive, whereas culture is often negative. This assay differentiates between HSV-1 and HSV-2.

This test has not been cleared or approved by the U.S. Food and Drug Administration. It was developed and its performance characteristics have been determined by the performing laboratory.

**CPT Codes:**
87530-90 x2

**LOINC Codes:**
5014-6
Heterophile Agglutination

ORDERING

Available Stat:
No

Performing Lab:
Immunology

Performed:
Wednesday and Friday (day shift)

Methodology:
Latex particle agglutination

Reported:
1-3 days

Additional Information:
Heterophile antibodies are present in greater than 90% of cases of infectious mononucleosis at some point during acute illness. These antibodies are named for their ability to react with the so-called Paul-Bunnell antigen found on bovine red blood cells. This test uses highly purified antigen to provide high sensitivity and specificity for detection of heterophile antibodies due to acute EBV infection, thus differential absorption with guinea pig kidney (GPK) is not required. In cases of heterophile-negative infection with high clinical suspicion, EBV-specific antibodies (see entry for EB Virus Antibodies) may be performed as a follow-up test.

Synonyms:
- monospot

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum

Rejection Criteria:
Hemolyzed specimen

PROCESSING

Test Code:
MONO

Performing Lab:
Immunology

Specimen Preparation:
Freeze serum at -20C

Preferred Volume:
0.5 mL serum

Rejection Criteria:
Hemolyzed specimen

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:

Heterophile antibodies are present in greater than 90% of cases of infectious mononucleosis at some point during acute illness. These antibodies are named for their ability to react with the so-called Paul-Bunnell antigen found on bovine red blood cells. This test uses highly purified antigen to provide high sensitivity and specificity for detection of heterophile antibodies due to acute EBV infection, thus differential absorption with guinea pig kidney (GPK) is not required. In cases of heterophile-negative infection with high clinical suspicion, EBV-specific antibodies (see entry for EB Virus Antibodies) may be performed as a follow-up test.

CPT Codes:
86308

LOINC Codes:
5213-4

COMPLETE VIEW

Available Stat: No
Test Code: MONO
Performing Lab: Immunology
Performed: Wednesday and Friday (day shift)
Methodology: Latex particle agglutination
Collect: Gold top
Amount to Collect: 1 mL blood
Sample Type: Serum
Preferred Volume: 0.5 mL serum
Rejection Criteria: Hemolyzed specimen
Specimen Preparation: Freeze serum at -20C
Reference Interval: Negative
Synonyms:
  • monospot
Reported: 1-3 days

Additional Information:

Heterophile antibodies are present in greater than 90% of cases of infectious mononucleosis at some point during acute illness. These antibodies are named for their ability to react with the so-called Paul-Bunnell antigen found on bovine red blood cells. This test uses highly purified antigen to provide high sensitivity and specificity for detection of heterophile antibodies due to acute EBV infection, thus differential absorption with guinea pig kidney (GPK) is not required. In cases of heterophile-negative infection with high clinical suspicion, EBV-specific antibodies (see entry for EB Virus Antibodies) may be performed as a follow-up test.

CPT Codes:
86308

LOINC Codes:
5213-4
Histamine, plasma
HIST

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzyme immunoassay
Reported:
Set up 2x per week. TAT: 6-8 days
Additional Information:
Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

COLLECTION

Patient Preparation:
Patient should avoid taking allergy causing drugs, antihistamines, oral corticosteroids and substances which block H2 receptors 24 hours prior to collection.
Sample Type:
EDTA plasma
Collect:
Lavender top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
Avoid hemolysis.
Stability (from collection to initiation):
Room temperature and refrigerated 1 day, frozen at -20C 1 week.
Unacceptable Conditions:
Hemolyzed
Rejection Criteria:
Thawed, refrigerated or room temperature sample.

PROCESSING

Test Code:
HIST
Test Group:
Histamine
Sendout:
Yes
Performing Lab:
Specimen Preparation:
Centrifuge immediately and freeze in plastic vial at -20C. Transport frozen to China basin. Order Quest # 36586X

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Hemolyzed

Rejection Criteria:
Thawed, refrigerated or room temperature sample.

Stability (from collection to initiation):
Room temperature and refrigerated 1 day, frozen at -20C 1 week.

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
0.1-1.8 ng/mL

Additional Information:
Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

ADMINISTRATIVE

CPT Codes:
83088-90

LOINC Codes:
2416-6

COMPLETE VIEW

Available Stat:
No

Test Code:
HIST

Test Group:
Histamine

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Enzyme immunoassay

Patient Preparation:
Patient should avoid taking allergy causing drugs, antihistamines, oral corticosteroids and substances which block H2 receptors 24 hours prior to collection.

Remarks:
Avoid hemolysis.

Collect:
Lavender top

**Amount to Collect:**
2 mL blood

**Sample Type:**
EDTA plasma

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Rejection Criteria:**
Thawed, refrigerated or room temperature sample.

**Unacceptable Conditions:**
Hemolyzed

**Specimen Preparation:**
Centrifuge immediately and freeze in plastic vial at -20C. Transport frozen to China basin. Order Quest # 36586X

**Units:**
ng/mL

**Reference Interval:**
0.1-1.8 ng/mL

**Stability (from collection to initiation):**
Room temperature and refrigerated 1 day, frozen at -20C 1 week.

**Reported:**
Set up 2x per week. TAT: 6-8 days

**Additional Information:**
Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

**CPT Codes:**
83088-90

**LOINC Codes:**
2416-6
Histamine, urine
HISTU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Radioimmunoassay
Reported:
Set up 2x per week. TAT 8-10 days.
Additional Information:
Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

COLLECTION

Patient Preparation:
Patient should avoid taking allergy causing drugs, antihistamines, oral corticosteroids and substances which block H2 receptors 24 hours prior to collection.
Sample Type:
24 hour urine collection
Collect:
Brown 24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Remarks:
Refrigerate specimen during collection. Protect sample from light
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen at -20C 2 weeks.
Unacceptable Conditions:
Container not refrigerated during collection or not protected from light

PROCESSING

Test Code:
HISTU
Test Group:
Histamine
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Process immediately. Aliquot 10 mL. Record total volume on both test request form and specimen container. Transport refrigerated.

**Preferred Volume:**
10 mL urine

**Minimum Volume:**
2 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection or not protected from light

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 2 weeks, frozen at -20C 2 weeks.

**RESULT INTERPRETATION**

**Units:**
mg/24 hours

**Reference Interval:**
Normal: 0.006 - 0.131 mg/24 hours

**Additional Information:**
Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

**ADMINISTRATIVE**

**CPT Codes:**
82570-90, 83088-90

**LOINC Codes:**
9410-2

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
HISTU

**Test Group:**
Histamine

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Radioimmunoassay

**Patient Preparation:**
Patient should avoid taking allergy causing drugs, antihistamines, oral corticosteroids and substances which block H2 receptors 24 hours prior to collection.

**Remarks:**
Refrigerate specimen during collection. Protect sample from light

**Collect:**
Brown [24 hour urine collection container]

**Amount to Collect:**
Entire 24 hour urine output
Sample Type: 24 hour urine collection

Preferred Volume: 10 mL urine

Minimum Volume: 2 mL urine

Unacceptable Conditions: Container not refrigerated during collection or not protected from light

Specimen Preparation: Process immediately. Aliquot 10 mL. Record total volume on both test request form and specimen container. Transport refrigerated. Order Quest # 6825N

Units: mg/24 hours

Reference Interval: Normal: 0.006 - 0.131 mg/24 hours

Stability (from collection to initiation): Room temperature 2 days, refrigerated 2 weeks, frozen at -20C 2 weeks.

Reported: Set up 2x per week. TAT 8-10 days.

Additional Information: Histamine is a mediator of the allergic response. Histamine release causes itching, flushing, hives, vomiting, syncope, and even shock. In addition, some patients with gastric carcinoids may exhibit high concentrations of Histamine.

This test was performed using a kit that has not been approved or cleared by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute.

This test should not be used for diagnosis without confirmation by other medically established means.

CPT Codes: 82570-90, 83088-90

LOINC Codes: 9410-2
Histone Antibody

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: EIA
Reported: 3-5 days

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Frozen 1 month

PROCESSING

Test Code: HISTO
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot serum and freeze. Forward to CB.
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Frozen 1 month

RESULT INTERPRETATION

Units: U
Reference Interval: <1.0 U
CPT Codes:
83516-90

COMPLETE VIEW

Available Stat:
No

Test Code:
HISTO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
EIA

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Aliquot serum and freeze. Forward to CB.

Units:
U

Reference Interval:
<1.0 U

Stability (from collection to initiation):
Frozen 1 month

Reported:
3-5 days

CPT Codes:
83516-90
Histoplasma capsulatum Antibody Immunodiffusion
HSTO

ORDERING

Available Stat: No
Performing Lab: Quest
Reported: Test performed Tuesday, Thursday and Saturday. Turnaround time: 4-6 days.
Additional Information: Preferred initial screening test.
ID testing detects both H and M bands. The H band is generally found in association with the M band, is unaffected by skin testing, and is consistently seen in patients with active histoplasmosis; the M band is often seen alone, is affected by skin testing, and may be found in either acute or chronic infection.
Testing by Complement Fixation is suggested on all positives.
Synonyms: • H. capsulatum

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Remarks: Sera should be screened by ID. Draw before doing fungal skin tests.

PROCESSING

Test Code: HSTO
Test Group: Histoplasma
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest # 52183P
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
# RESULT INTERPRETATION

**Reference Interval:**
- Negative

**Additional Information:**
- Preferred initial screening test.

ID testing detects both H and M bands. The H band is generally found in association with the M band, is unaffected by skin testing, and is consistently seen in patients with active histoplasmosis; the M band is often seen alone, is affected by skin testing, and may be found in either acute or chronic infection.

Testing by Complement Fixation is suggested on all positives.

# ADMINISTRATIVE

**CPT Codes:**
- 86698-90

**LOINC Codes:**
- 5218-3

# COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- HSTO

**Test Group:**
- Histoplasma

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Remarks:**
- Sera should be screened by ID. Draw before doing fungal skin tests.

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Specimen Preparation:**
- Refrigerate. Order Quest # 52183P

**Reference Interval:**
- Negative

**Synonyms:**
- H. capsulatum

**Reported:**
- Test performed Tuesday, Thursday and Saturday. Turnaround time: 4-6 days.

**Additional Information:**
- Preferred initial screening test.

ID testing detects both H and M bands. The H band is generally found in association with the M band, is unaffected by skin testing, and

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*Printed 06/07/19
Test information subject to change*
is consistently seen in patients with active histoplasmosis; the M band is often seen alone, is affected by skin testing, and may be found in either acute or chronic infection.

Testing by Complement Fixation is suggested on all positives.

**CPT Codes:**
86698-90

**LOINC Codes:**
5218-3
Histoplasma capsulatum Antibody, by Complement Fixation
HICFB

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Complement fixation
Reported:
Test set up Monday - Friday, Turn around time 3-5 days
Additional Information:
Patients should be screened by immunodiffusion before requesting complement fixation. Titers to both mycelial and yeast phase antigens are reported, yeast phase antigen being more sensitive but less specific than mycelial phase antigen. Cross reactions frequently occur with Blastomyces and Coccidioides.

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Collect samples prior to performing fungal skin testing which can significantly increase antibody titers in sensitized individuals making results of this test uninterpretable.
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.
Unacceptable Conditions:
Hemolysis, lipemia
Rejection Criteria:
Hemolysis, lipemia

PROCESSING

Test Code:
HICFB
Test Group:
Histoplasma
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Order Quest test # 938X. For B&T patients order LabCorp test # 164319
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Hemolysis, lipemia

Rejection Criteria:
Hemolysis, lipemia

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
Titer

Reference Interval:
<1:8

Additional Information:
Patients should be screened by immunodiffusion before requesting complement fixation. Titers to both mycelial and yeast phase antigens are reported, yeast phase antigen being more sensitive but less specific than mycelial phase antigen. Cross reactions frequently occur with Blastomyces and Coccidioides.

ADMINISTRATIVE

CPT Codes:
86698-90 x2

LOINC Codes:
20573-2

COMPLETE VIEW

Available Stat:
No

Test Code:
HICFB

Test Group:
Histoplasma

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Complement fixation

Remarks:
Collect samples prior to performing fungal skin testing which can significantly increase antibody titers in sensitized individuals making results of this test uninterpretable.

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Printed 06/07/19
Test information subject to change
Hemolysis, lipemia

**Unacceptable Conditions:**
- Hemolysis, lipemia

**Specimen Preparation:**
- Order Quest test # 938X. For B&T patients order LabCorp test # 164319

**Units:**
- Titer

**Reference Interval:**
- <1.8

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

**Reported:**
- Test set up Monday - Friday, Turn around time 3-5 days

**Additional Information:**
- Patients should be screened by immunodiffusion before requesting complement fixation. Titers to both mycelial and yeast phase antigens are reported, yeast phase antigen being more sensitive but less specific than mycelial phase antigen. Cross reactions frequently occur with Blastomyces and Coccidioides.

**CPT Codes:**
- 86698-90 x2

**LOINC Codes:**
- 20573-2
Histoplasma capsulatum Antigen

ORDERING

Approval Required:
Yes, for testing requested on specimens other than urine.

Available Stat:
No

Performing Lab:
Mira Vista Diagnostics via Quest

Methodology:
Enzyme immunoassay

Reported:
Test performed Monday-Friday. Turnaround: 2-5 days.

Additional Information:
Urine is the most sensitive specimen for diagnosis.

Sensitivity:
Disseminated infection: 92%
Severe pulmonary infection: 80%
Self-limited pulmonary infection: 34%
Chronic pulmonary infection: 14%

Synonyms:
• H. capsulatum

COLLECTION

Sample Type:
Random urine, EDTA or heparinized plasma, serum, CSF, BAL

Collect:
Urine: Urine cup
Blood: Gold top, Lavender top, Lt Green top, Red top
CSF: CSF tube or sterile collection tube
BAL: Black top tube

Amount to Collect:
Urine: 10 mL
Blood: 4 mL
All other samples: 2 mL

Preferred Volume:
Urine: 2 mL
Plasma or serum: 2 mL
All other samples: 2 mL

Minimum Volume:
Urine: 0.5 mL
Plasma or serum: 1 mL
All other samples: 1 mL

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 2 months

Unacceptable Conditions:
Specimen submitted < 2 weeks after prior specimen.

PROCESSING

Test Code:
HISTAG
Test Group:
Histoplasma
Sendout:
Yes
Performing Lab:
Mira Vista Diagnostics via Quest
Specimen Preparation:
Refrigerate sample. Order Quest test code #34441X
Preferred Volume:
Urine: 2 mL
Plasma or serum: 2 mL
All other samples: 2 mL
Minimum Volume:
Urine: 0.5 mL
Plasma or serum: 1 mL
All other samples: 1 mL
Unacceptable Conditions:
Specimen submitted < 2 weeks after prior specimen.
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 2 months

RESULT INTERPRETATION

Units:
ng/mL
Reference Interval:
<0.7: Negative
0.7-2.9: Borderline
> 2.9: Moderate to strong positive
Additional Information:
Urine is the most sensitive specimen for diagnosis.
Sensitivity:
Disseminated infection: 92%
Severe pulmonary infection: 80%
Self-limited pulmonary infection: 34%
Chronic pulmonary infection: 14%

ADMINISTRATIVE

CPT Codes:
87385-90
LOINC Codes:
13971-7

COMPLETE VIEW

Approval Required:
Yes, for testing requested on specimens other than urine.
Available Stat:
No
Test Code:
HISTAG
Test Group:
Histoplasma
Performing Lab:
Sendout:
   Yes

Methodology:
   Enzyme immunoassay

Collect:
   Urine: Urine cup
   Blood: Gold top, Lavender top, Lt Green top, Red top
   CSF: CSF tube or sterile collection tube
   BAL: Black top tube

Amount to Collect:
   Urine: 10 mL
   Blood: 4 mL
   All other samples: 2 mL

Sample Type:
   Random urine, EDTA or heparinized plasma, serum, CSF, BAL

Preferred Volume:
   Urine: 2 mL
   Plasma or serum: 2 mL
   All other samples: 2 mL

Minimum Volume:
   Urine: 0.5 mL
   Plasma or serum: 1 mL
   All other samples: 1 mL

Unacceptable Conditions:
   Specimen submitted < 2 weeks after prior specimen.

Specimen Preparation:
   Refrigerate sample. Order Quest test code #34441X

Units:
   ng/mL

Reference Interval:
   <0.7: Negative
   0.7-2.9: Borderline
   > 2.9: Moderate to strong positive

Synonyms:
   • H. capsulatum

Stability (from collection to initiation):
   Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 2 months

Reported:
   Test performed Monday-Friday. Turnaround: 2-5 days.

Additional Information:
   Urine is the most sensitive specimen for diagnosis.

Sensitivity:
   Disseminated infection: 92%
   Severe pulmonary infection: 80%
   Self-limited pulmonary infection: 34%
   Chronic pulmonary infection: 14%

CPT Codes:
   87385-90

LOINC Codes:
   13971-7
HIV Antibody and Antigen Combination Test

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Immunology

**Performed:**
Monday - Friday (day shift only)

**Methodology:**
Chemiluminescent Immunoassay

**Reported:**
3-5 days (3-5 additional days for confirmation of positives)

**Additional Information:**
This test detects antibodies to HIV-1 and HIV-2 along with the p24 antigen. Reactive results will be tested secondarily with an immunoassay to differentiate HIV-1 antibodies from HIV-2 antibodies. Indeterminate or negative results on the secondary assay will be reflex tested for HIV nucleic acid (HIV-1 NAT, sendout test). Positive screening with negative or equivocal secondary testing could indicate acute HIV infection or a false positive result. This testing methodology follows the CDC recommendations published in June 2014 (for further information, see http://www.cdc.gov/hiv/guidelines/testing.html).

Note: Per the CDC recommendations, HIV-1 Western blot testing is generally not indicated with the availability of the HIV-1 NAT test. HIV-1 NAT can be ordered separately in cases where a false positive screening result is suspected.

**Reflex Testing:**
HIV-1/2 Antibody Differentiation will automatically be performed on all positive samples at an additional charge. Indeterminate or negative results on the secondary assay will be reflex to HIV-1 NAT testing (send out test).

**Synonyms:**
- Human Immunodeficiency virus:HIV-1, HIV-2 Antibody & HIV-1 p24 Antigen

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum

**Remarks:**
For tests not ordered directly via APEX, the ordering provider should document patient consent in the medical record

**Stability (from collection to initiation):**
Room temperature 3 days

**Unacceptable Conditions:**
Grossly hemolyzed samples

**PROCESSING**

**Test Code:**
HIVAA

**Test Group:**
HIV

**Performing Lab:**
Immunology
Specimen Preparation:
Refrigerate samples.

Preferred Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed samples

Stability (from collection to initiation):
Room temperature 3 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
This test detects antibodies to HIV-1 and HIV-2 along with the p24 antigen. Reactive results will be tested secondarily with an
immunoassay to differentiate HIV-1 antibodies from HIV-2 antibodies. Indeterminate or negative results on the secondary assay will be
reflex tested for HIV nucleic acid (HIV-1 NAT, sendout test). Positive screening with negative or equivocal secondary testing could
indicate acute HIV infection or a false positive result. This testing methodology follows the CDC recommendations published in June
2014 (for further information, see http://www.cdc.gov/hiv/guidelines/testing.html).

Note: Per the CDC recommendations, HIV-1 Western blot testing is generally not indicated with the availability of the HIV-1 NAT test.
HIV-1 NAT can be ordered separately in cases where a false positive screening result is suspected.

Interpretive Data:

<table>
<thead>
<tr>
<th>Assay interpretation for secondary testing:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-1</td>
<td>HIV-2</td>
<td>Assay Interpretation</td>
</tr>
<tr>
<td>Nonreactive Antibody Result</td>
<td>Nonreactive</td>
<td>HIV ANTIBODY NEGATIVE</td>
</tr>
<tr>
<td>Indeterminate Antibody</td>
<td>Nonreactive</td>
<td>HIV-1 INDETERMINATE a</td>
</tr>
<tr>
<td>Nonreactive Antibody</td>
<td>Indeterminate</td>
<td>HIV-2 INDETERMINATE b</td>
</tr>
<tr>
<td>Indeterminate Antibody</td>
<td>Indeterminate</td>
<td>HIV INDETERMINATE c</td>
</tr>
<tr>
<td>Reactive Antibody Result</td>
<td>Nonreactive</td>
<td>HIV-1 POSITIVE</td>
</tr>
<tr>
<td>Reactive Antibody Result</td>
<td>Indeterminate</td>
<td>HIV-1 POSITIVE</td>
</tr>
<tr>
<td>Nonreactive Antibody Result</td>
<td>Reactive</td>
<td>HIV-2 POSITIVE</td>
</tr>
<tr>
<td>Indeterminate Antibody Result</td>
<td>Reactive</td>
<td>HIV-2 POSITIVE</td>
</tr>
</tbody>
</table>
| Reactive Antibody Result | Reactive | HIV POSITIVE Untypable (undifferentiated): Antibodies to HIV-1 and HIV-2 confirmed in the sample. This may
occur in an HIV-2 positive sample with significant cross-reactivity to HIV-1, or may be due to co-infection with
both HIV-1 and HIV-2 (rare).* |

*Note: Differentiation features managed by proprietary algorithm.

a HIV-1 band(s) detected but did not meet the criteria for HIV-1 Positivity. No HIV-2 bands were detected.
b HIV-2 band(s) detected but did not meet the criteria for HIV-2 Positivity. No HIV-1 bands were detected.
c HIV band(s) detected but did not meet the criteria for HIV-1 Positivity or HIV-2 Positivity.

ADMINISTRATIVE

CPT Codes:
87389

LOINC Codes:
56888-1

COMPLETE VIEW

Available Stat:
No

Test Code:
HIVAA
Test Group:
- HIV
Performing Lab:
- Immunology
Performed:
- Monday - Friday (day shift only)
Methodology:
- Chemiluminescent Immunoassay
Remarks:
- For tests not ordered directly via APEX, the ordering provider should document patient consent in the medical record
Collect:
- Red top
Amount to Collect:
- 1 mL blood
Sample Type:
- Serum
Preferred Volume:
- 0.5 mL serum
Unacceptable Conditions:
- Grossly hemolyzed samples
Specimen Preparation:
- Refrigerate samples.
Reference Interval:
- Negative
Interpretive Data:

Assay interpretation for secondary testing:

<table>
<thead>
<tr>
<th>HIV-1 Antibody Result</th>
<th>HIV-2 Antibody Result</th>
<th>Assay Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonreactive</td>
<td>Nonreactive</td>
<td>HIV ANTIBODY NEGATIVE</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>Nonreactive</td>
<td>HIV-1 INDETERMINATE a</td>
</tr>
<tr>
<td>Nonreactive</td>
<td>Indeterminate</td>
<td>HIV-2 INDETERMINATE b</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>Indeterminate</td>
<td>HIV INDETERMINATE c</td>
</tr>
<tr>
<td>Reactive</td>
<td>Nonreactive</td>
<td>HIV-1 POSITIVE</td>
</tr>
<tr>
<td>Reactive</td>
<td>Indeterminate</td>
<td>HIV-1 POSITIVE</td>
</tr>
<tr>
<td>Nonreactive</td>
<td>Reactive</td>
<td>HIV-2 POSITIVE</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>Reactive</td>
<td>HIV-2 POSITIVE</td>
</tr>
<tr>
<td>Reactive</td>
<td>Reactive</td>
<td>HIV POSITIVE</td>
</tr>
</tbody>
</table>

HIV POSITIVE Untypable (undifferentiated): Antibodies to HIV-1 and HIV-2 confirmed in the sample. This may occur in an HIV-2 positive sample with significant cross-reactivity to HIV-1, or may be due to co-infection with both HIV-1 and HIV-2 (rare).*

*Note: Differentiation features managed by proprietary algorithm.

a HIV-1 band(s) detected but did not meet the criteria for HIV-1 Positivity. No HIV-2 bands were detected.
b HIV-2 band(s) detected but did not meet the criteria for HIV-2 Positivity. No HIV-1 bands were detected.
c HIV band(s) detected but did not meet the criteria for HIV-1 Positivity or HIV-2 Positivity.

Synonyms:
- Human Immunodeficiency virus:HIV-1, HIV-2 Antibody & HIV-1 p24 Antigen

Stability (from collection to initiation):
- Room temperature 3 days

Reported:
- 3-5 days (3-5 additional days for confirmation of positives)

Reflex Testing:
- HIV-1/2 Antibody Differentiation will automatically be performed on all positive samples at an additional charge. Indeterminate or negative results on the secondary assay will be reflex to HIV-1 NAT testing (send out test).

Additional Information:
- This test detects antibodies to HIV-1 and HIV-2 along with the p24 antigen. Reactive results will be tested secondarily with an immunoassay to differentiate HIV-1 antibodies from HIV-2 antibodies. Indeterminate or negative results on the secondary assay will be
reflex tested for HIV nucleic acid (HIV-1 NAT, sendout test). Positive screening with negative or equivocal secondary testing could indicate acute HIV infection or a false positive result. This testing methodology follows the CDC recommendations published in June 2014 (for further information, see http://www.cdc.gov/hiv/guidelines/testing.html).

Note: Per the CDC recommendations, HIV-1 Western blot testing is generally not indicated with the availability of the HIV-1 NAT test. HIV-1 NAT can be ordered separately in cases where a false positive screening result is suspected.

CPT Codes:
87389

LOINC Codes:
56888-1
HIV Genotyping
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Monogram Bioscience
Methodology:
PCR/ABI
Additional Information:
Note: Patients must have a viral load of at least 500 copies/mL for genotyping to be performed.

Testing recommendadions:


Panel's Recommendations:
· HIV drug-resistance testing is recommended in persons with HIV infection at entry into care regardless of whether antiretroviral therapy (ART) will be initiated immediately or deferred (AII). If therapy is deferred, repeat testing should be considered at the time of ART initiation (CIII).
· Genotypic testing is recommended as the preferred resistance testing to guide therapy in antiretroviral (ARV)-na•ve patients (AIII).
· Standard genotypic drug-resistance testing in ARV-na•ve persons involves testing for mutations in the reverse transcriptase (RT) and protease (PR) genes. If transmitted integrase strand transfer inhibitor (INSTI) resistance is a concern, providers may wish to supplement standard genotypic resistance testing with an INSTI genotype test (CIII).
· HIV drug-resistance testing should be performed to assist in the selection of active drugs when changing ARV regimens in persons with virologic failure and HIV RNA levels >1,000 copies/mL (AI). In persons with HIV RNA levels >500 but <1,000 copies/mL, testing may be unsuccessful but should still be considered (BII).
· Drug-resistance testing should also be performed when managing suboptimal viral load reduction (AII).
· In persons failing INSTI-based regimens, genotypic testing for INSTI resistance should be performed to determine whether to include a drug from this class in subsequent regimens (AII).
· Drug-resistance testing in the setting of virologic failure should be performed while the person is taking prescribed ARV drugs or, if not possible, within 4 weeks after discontinuing therapy (AII).
· Genotypic testing is recommended as the preferred resistance testing to guide therapy in patients with suboptimal virologic responses or virologic failure while on first or second regimens (AII).
· The addition of phenotypic to genotypic testing is generally preferred for persons with known or suspected complex drugresistance mutation patterns, particularly to protease inhibitors (PIs) (BIII).
· Genotypic resistance testing is recommended for all pregnant women before initiation of ART (AII) and for those entering pregnancy with detectable HIV RNA levels while on therapy (AI).

Rating of Recommendations
A = Strong
B = Moderate
C = Optional

Rating of Evidence
I = Data from randomized controlled trials
II = Data from well-designed nonrandomized trials or observational
III = Expert opinion

Synonyms:
· PCR

COLLECTION

Sample Type:
EDTA Plasma
Collect:
Lavender top
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL plasma
Minimum Volume:  
3 mL plasma

Remarks:  
Note: If both genotyping and phenotyping are requested for B&T patients, TWO separate tubes should be drawn.

PROCESSING

Test Code:  
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:  
HIV

Sendout:  
Yes

Performing Lab:  
Monogram Bioscience

Specimen Preparation:  
Centrifuge sample @ 100-1200g x 10-15 min. and separate plasma within 6 hours of sample collection. Transfer plasma to capped plastic tube and freeze at -20C. Do not thaw sample after freezing. Ship frozen with dry ice.

Note: If both genotyping and phenotyping are requested for B&T patients, aliquot the two tubes separately and freeze at -20C.

Preferred Volume:  
3 mL plasma

Minimum Volume:  
3 mL plasma

RESULT INTERPRETATION

Additional Information:  
Note: Patients must have a viral load of at least 500 copies/mL for genotyping to be performed.

Testing recommendations:


Panel's Recommendations:
- HIV drug-resistance testing is recommended in persons with HIV infection at entry into care regardless of whether antiretroviral therapy (ART) will be initiated immediately or deferred (AII). If therapy is deferred, repeat testing should be considered at the time of ART initiation (CIII).
- Genotypic testing is recommended as the preferred resistance testing to guide therapy in antiretroviral (ARV)-naïve patients (AIII).
- Standard genotypic drug-resistance testing in ARV-naïve persons involves testing for mutations in the reverse transcriptase (RT) and protease (PR) genes. If transmitted integrase strand transfer inhibitor (INSTI) resistance is a concern, providers may wish to supplement standard genotypic resistance testing with an INSTI genotype test (CIII).
- HIV drug-resistance testing should be performed to assist in the selection of active drugs when changing ARV regimens in persons with virologic failure and HIV RNA levels >1,000 copies/mL (A). In persons with HIV RNA levels >500 but <1,000 copies/mL, testing may be unsuccessful but should still be considered (BII).
- Drug-resistance testing should also be performed when managing suboptimal viral load reduction (AII).
- In persons failing INSTI-based regimens, genotypic testing for INSTI resistance should be performed to determine whether to include a drug from this class in subsequent regimens (AII).
- Drug-resistance testing in the setting of virologic failure should be performed while the person is taking prescribed ARV drugs or, if not possible, within 4 weeks after discontinuing therapy (AII).
- Genotypic testing is recommended as the preferred resistance testing to guide therapy in patients with suboptimal virologic responses or virologic failure while on first or second regimens (AII).
- The addition of phenotypic to genotypic testing is generally preferred for persons with known or suspected complex drugresistance mutation patterns, particularly to protease inhibitors (PIs) (BIII).
- Genotypic resistance testing is recommended for all pregnant women before initiation of ART (AIII) and for those entering pregnancy with detectable HIV RNA levels while on therapy (AII)

Rating of Recommendations  
A = Strong  
B = Moderate

Rating of Evidence  
I = Data from randomized controlled trials  
II = Data from well-designed nonrandomized trials or observational
Available Stat: No

Test Code: MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

Test Group: HIV

Performing Lab: Monogram Bioscience

Sendout: Yes

Methodology: PCR/ABI

Remarks: Note: If both genotyping and phenotyping are requested for B&T patients, TWO separate tubes should be drawn.

Collect: Lavender top

Amount to Collect: 6 mL blood

Sample Type: EDTA Plasma

Preferred Volume: 3 mL plasma

Minimum Volume: 3 mL plasma

Specimen Preparation: Centrifuge sample @ 100-1200g x 10-15 min. and separate plasma within 6 hours of sample collection. Transfer plasma to capped plastic tube and freeze at -20C. Do not thaw sample after freezing. Ship frozen with dry ice.

Note: If both genotyping and phenotyping are requested for B&T patients, aliquot the two tubes separately and freeze at -20C.

Synonyms: PCR

Additional Information: Note: Patients must have a viral load of at least 500 copies/mL for genotyping to be performed.

Testing recommnedations:


Panel's Recommendations:
- HIV drug-resistance testing is recommended in persons with HIV infection at entry into care regardless of whether antiretroviral therapy (ART) will be initiated immediately or deferred (AII). If therapy is deferred, repeat testing should be considered at the time of ART initiation (CIII).
- Genotypic testing is recommended as the preferred resistance testing to guide therapy in antiretroviral (ARV)-naive patients (AIII).
- Standard genotypic drug-resistance testing in ARV-naive persons involves testing for mutations in the reverse transcriptase (RT) and protease (PR) genes. If transmitted integrase strand transfer inhibitor (INSTI) resistance is a concern, providers may wish to supplement standard genotypic resistance testing with an INSTI genotype test (CIII).
- HIV drug-resistance testing should be performed to assist in the selection of active drugs when changing ARV regimens in persons with virologic failure and HIV RNA levels >1,000 copies/mL (AII). In persons with HIV RNA levels >500 but <1,000 copies/mL, testing may be unsuccessful but should still be considered (BII).
- Drug-resistance testing should also be performed when managing suboptimal viral load reduction (AII).
- In persons failing INSTI-based regimens, genotypic testing for INSTI resistance should be performed to determine whether to include a drug from this class in subsequent regimens (AII).
- Drug-resistance testing in the setting of virologic failure should be performed while the person is taking prescribed ARV drugs or, if not
possible, within 4 weeks after discontinuing therapy (All).

- Genotypic testing is recommended as the preferred resistance testing to guide therapy in patients with suboptimal virologic responses or virologic failure while on first or second regimens (All).
- The addition of phenotypic to genotypic testing is generally preferred for persons with known or suspected complex drugresistance mutation patterns, particularly to protease inhibitors (PIs) (BIII).
- Genotypic resistance testing is recommended for all pregnant women before initiation of ART (All) and for those entering pregnancy with detectable HIV RNA levels while on therapy (AI)

<table>
<thead>
<tr>
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<tr>
<td>Rating of Evidence</td>
<td>I = Data from randomized controlled trials</td>
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<td>III = Expert opinion</td>
</tr>
</tbody>
</table>
HIV Phenotyping
MOLT

ORDERING

Available Stat: No
Performing Lab: Monogram Biosciences
Methodology: Culture
Additional Information: HIV susceptibility testing (genotyping or phenotyping) should be reserved for patients who are: 1. Failing treatment requiring a change in regimen (prior to change in regimen) 2. Pregnant or 3. Have acute/recent HIV infection (w/in 3-6 months) in areas with high levels of transmission of resistance viruses (usually to AZT/3TC). Phenotyping requires a viral load > 500 copies/mL.


COLLECTION

Sample Type: EDTA plasma
Collect: Lavender top
Amount to Collect: 6 mL blood
Preferred Volume: 3 mL plasma
Minimum Volume: 3 mL plasma
Remarks: Note: If both genotyping and phenotyping are requested for B&T patients, TWO separate tubes should be drawn.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: HIV
Sendout: Yes
Performing Lab: Monogram Biosciences
Specimen Preparation: Centrifuge sample @ 100-1200g x 10-15 min. and separate plasma within 6 hours of sample collection. Transfer plasma to capped plastic tube and freeze at -20C. Do not thaw sample after freezing. Ship frozen with dry ice.

Note: If both genotyping and phenotyping are requested for B&T patients, aliquot the two tubes separately and freeze at -20C.
Preferred Volume: 3 mL plasma
Minimum Volume: 3 mL plasma

RESULT INTERPRETATION
Reference Interval:
See Additional Information

Additional Information:

HIV susceptibility testing (genotyping or phenotyping) should be reserved for patients who are: 1. Failing treatment requiring a change in regimen (prior to change in regimen) 2. Pregnant or 3. Have acute/recent HIV infection (w/in 3-6 months) in areas with high levels of transmission of resistance viruses (usually to AZT/3TC). Phenotyping requires a viral load > 500 copies/mL.


COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
HIV

Performing Lab:
Monogram Biosciences

Sendout:
Yes

Methodology:
Culture

Remarks:
Note: If both genotyping and phenotyping are requested for B&T patients, TWO separate tubes should be drawn.

Collect:
Lavender top

Amount to Collect:
6 mL blood

Sample Type:
EDTA plasma

Preferred Volume:
3 mL plasma

Minimum Volume:
3 mL plasma

Specimen Preparation:
Centrifuge sample @ 100-1200g x 10-15 min. and separate plasma within 6 hours of sample collection. Transfer plasma to capped plastic tube and freeze at -20C. Do not thaw sample after freezing. Ship frozen with dry ice.

Note: If both genotyping and phenotyping are requested for B&T patients, aliquot the two tubes separately and freeze at -20C.

Reference Interval:
See Additional Information

Additional Information:

HIV susceptibility testing (genotyping or phenotyping) should be reserved for patients who are: 1. Failing treatment requiring a change in regimen (prior to change in regimen) 2. Pregnant or 3. Have acute/recent HIV infection (w/in 3-6 months) in areas with high levels of transmission of resistance viruses (usually to AZT/3TC). Phenotyping requires a viral load > 500 copies/mL.

HIV Rapid Antibody Screen

ORDERING

Approval Required:
Testing Limited to OB Service and Employee Health

Available Stat:
Yes

Performing Lab:
Parnassus Blood Gas lab

Performed:
Test available 24 hours per day 7 days per week

Methodology:
OraQuick ADVANCE Qualitative Immunoassay

Reported:
1 hour

Additional Information:
The Screening HIV Antibody test is only offered in the following situations:

1. High-risk OB patients in whom a prenatal HIV antibody test was not performed and when delivery is expected within the next 24 hours.
2. Testing of patients after a healthcare worker has had a needlestick or body fluid exposure.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Reflex Testing:
If positive a HIV differentiation using the "HIV-1/2 Antibody Differentiation" test will automatically be performed at a separate charge.

Synonyms:
- HIV Ab
- Rapid HIV screen

COLLECTION

Sample Type:
EDTA whole blood & serum

Collect:
Lavender top & Red top

Amount to Collect:
0.5 mL blood (LAV) & 3 mL (Red)

Preferred Volume:
0.5 mL blood (EDTA) & 1 mL serum

Remarks:
Testing is limited to OB service, and Employee Health. Consent should be documented in the patient or employee record as applicable. Include contact information (pager #) for phoning results on the request.

Unacceptable Conditions:
Samples NOT received from OB or Employee Health.

PROCESSING

Test Code:
HIVR

Test Group:
HIV
Performing Lab:
   Parnassus Blood Gas lab

Specimen Preparation:
   Refer all Parnassus samples to Blood Gas Lab (NCPL) pneumatic tube station #916 Phone x31755;
   Refer all Mission bay samples to Mission Bay Hospital Lab, pneumatic tube station #21 Phone x42146

Preferred Volume:
   0.5 mL blood (EDTA) & 1 mL serum

Unacceptable Conditions:
   Samples NOT received from OB or Employee Health.

RESULT INTERPRETATION

Reference Interval:
   Negative

Critical Values:
   All results will be phoned

Additional Information:
   The Screening HIV Antibody test is only offered in the following situations:
   1. High-risk OB patients in whom a prenatal HIV antibody test was not performed and when delivery is expected within the next 24 hours.
   2. Testing of patients after a healthcare worker has had a needlestick or body fluid exposure.

   Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
   86703

LOINC Codes:
   49580-4

COMPLETE VIEW

Approval Required:
   Testing Limited to OB Service and Employee Health

Available Stat:
   Yes

Test Code:
   HIVR

Test Group:
   HIV

Performing Lab:
   Parnassus Blood Gas lab

Performed:
   Test available 24 hours per day 7 days per week

Methodology:
   OraQuick ADVANCE Qualitative Immunoassay

Remarks:
   Testing is limited to OB service, and Employee Health. Consent should be documented in the patient or employee record as applicable. Include contact information (pager #) for phoning results on the request.

Collect:
   Lavender top & Red top

Amount to Collect:
0.5 mL blood (LAV) & 3 mL (Red)

**Sample Type:**
- EDTA whole blood & serum

**Preferred Volume:**
- 0.5 mL blood (EDTA) & 1 mL serum

**Unacceptable Conditions:**
- Samples NOT received from OB or Employee Health.

**Specimen Preparation:**
- Refer all Parnassus samples to Blood Gas Lab (NCPL) pneumatic tube station #916 Phone x31755;
- Refer all Mission bay samples to Mission Bay Hospital Lab, pneumatic tube station #21 Phone x42146

**Reference Interval:**
- Negative

**Critical Values:**
- All results will be phoned

**Synonyms:**
- HIV Ab
- Rapid HIV screen

**Reported:**
- 1 hour

**Reflex Testing:**
- If positive a HIV differentiation using the “HIV-1/2 Antibody Differentiation” test will automatically be performed at a separate charge.

**Additional Information:**
- The Screening HIV Antibody test is only offered in the following situations:
  1. High-risk OB patients in whom a prenatal HIV antibody test was not performed and when delivery is expected within the next 24 hours.
  2. Testing of patients after a healthcare worker has had a needlestick or body fluid exposure.

- Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**
- 86703

**LOINC Codes:**
- 49580-4
HIV-1 DNA, Qualitative - for patients < 6 month of age
MOLT

ORDERING

Performing Lab:
Quest
Methodology:
PCR
Reported:
Set up: Tues-Sat; Report available: next day.
Additional Information:
This test is generally performed ONLY on neonates and infants under 6 months of age. The sensitivity of the assay is 10 copies/mL whole blood and is only available as a qualitative assay. The test detects viral DNA that has integrated into the host genome within white blood cells rather than free RNA. In general, this test is considered interchangeable with HIV-1 RNA measured by PCR, but the minimum blood volume required is lower (1 mL whole blood vs. 1.1 mL plasma). The sensitivity of either test is low during the first month of life, and repeat testing at 1-2 months of age is recommended.

Click here for the CDC definition of HIV infection in patients < 18 months of age
Synonyms:
• Neonatal HIV screen

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top, Yellow (ACD) acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood
Minimum Volume:
0.5 mL blood
Stability (from collection to initiation):
Room temperature: 6 days
Refrigerated: 6 days
Frozen: Unacceptable
Storage/Transport Temperature:
Room temperature
Rejection Criteria:
Hemolysis • Received frozen • Heparinized whole blood

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
HIV
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do NOT centrifuge. Keep at room temperature. Complete form including specimen number, age, sex and date only; do not include
patient name or hospital number. Order Quest # 98376P.

**Preferred Volume:**
1 mL blood

**Minimum Volume:**
0.5 mL blood

**Rejection Criteria:**
- Hemolysis
- Received frozen
- Heparinized whole blood

**Stability (from collection to initiation):**
- Room temperature: 6 days
- Refrigerated: 6 days
- Frozen: Unacceptable

**Storage/Transport Temperature:**
- Room temperature

### RESULT INTERPRETATION

**Reference Interval:**
Not detected

**Additional Information:**
This test is generally performed **ONLY** on neonates and infants under 6 months of age. The sensitivity of the assay is 10 copies/mL whole blood and is only available as a qualitative assay. The test detects viral DNA that has integrated into the host genome within white blood cells rather than free RNA. In general, this test is considered interchangeable with HIV-1 RNA measured by PCR, but the minimum blood volume required is lower (1 mL whole blood vs. 1.1 mL plasma). The sensitivity of either test is low during the first month of life, and repeat testing at 1-2 months of age is recommended.

[Click here for the CDC definition of HIV infection in patients < 18 months of age](#)

### ADMINISTRATIVE

**CPT Codes:**
- 87535

**LOINC Codes:**
- 44871-2

### COMPLETE VIEW

**Test Code:**
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

**Test Group:**
HIV

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
PCR

**Collect:**
Lavender top, Yellow (ACD) acceptable

**Amount to Collect:**
1 mL blood

**Sample Type:**
EDTA whole blood

**Preferred Volume:**
1 mL blood

**Minimum Volume:**
0.5 mL blood
Rejection Criteria:
- Hemolysis
- Received frozen
- Heparinized whole blood

Specimen Preparation:
Do NOT centrifuge. Keep at room temperature. Complete form including specimen number, age, sex and date only; do not include patient name or hospital number. Order Quest # 98376P.

Reference Interval:
- Not detected

Synonyms:
- Neonatal HIV screen

Storage/Transport Temperature:
- Room temperature

Stability (from collection to initiation):
- Room temperature: 6 days
- Refrigerated: 6 days
- Frozen: Unacceptable

Reported:
- Set up: Tues-Sat; Report available: next day.

Additional Information:
This test is generally performed ONLY on neonates and infants under 6 months of age. The sensitivity of the assay is 10 copies/mL whole blood and is only available as a qualitative assay. The test detects viral DNA that has integrated into the host genome within white blood cells rather than free RNA. In general, this test is considered interchangeable with HIV-1 RNA measured by PCR, but the minimum blood volume required is lower (1 mL whole blood vs. 1.1 mL plasma). The sensitivity of either test is low during the first month of life, and repeat testing at 1-2 months of age is recommended.

Click here for the CDC definition of HIV infection in patients < 18 months of age

CPT Codes:
- 87535

LOINC Codes:
- 44871-2
HIV-1 RNA, CSF
HIVRC

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
PCR
Reported:
3-5 days
Additional Information:
This test is intended for use in conjunction with clinical presentation and other laboratory markers of disease progress for the clinical management of HIV-1 infected patients. The test can be used to assess patient prognosis by measuring the baseline HIV-1 RNA level or to monitor the effects of antiretroviral therapy by measuring changes in EDTA plasma HIV-1 RNA levels during the course of antiretroviral treatment.

COLLECTION

Sample Type:
CSF
Collect:
CSF tube
Amount to Collect:
3 mL CSF
Preferred Volume:
3 mL CSF
Minimum Volume:
1.1 mL CSF
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 6 days, frozen 42 days
Rejection Criteria:
Specimen collected using heparin as anticoagulant. Leaking, uncapped or broken containers.

PROCESSING

Test Code:
HIVRC
Test Group:
HIV
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 16186.
Preferred Volume:
3 mL CSF
Minimum Volume:
1.1 mL CSF
Rejection Criteria:
Specimen collected using heparin as anticoagulant. Leaking, uncapped or broken containers.
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 6 days, frozen 42 days

RESULT INTERPRETATION

Units:
Copies/mL & Log copies/mL

Reference Interval:
<20 copies/mL
< 1.30 log copies/mL

Additional Information:
This test is intended for use in conjunction with clinical presentation and other laboratory markers of disease progress for the clinical management of HIV-1 infected patients. The test can be used to assess patient prognosis by measuring the baseline HIV-1 RNA level or to monitor the effects of antiretroviral therapy by measuring changes in EDTA plasma HIV-1 RNA levels during the course of antiretroviral treatment.

ADMINISTRATIVE

CPT Codes:
87536-90

LOINC Codes:
41497-9, 41498-7

COMPLETE VIEW

Available Stat:
No

Test Code:
HIVRC

Test Group:
HIV

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
PCR

Collect:
CSF tube

Amount to Collect:
3 mL CSF

Sample Type:
CSF

Preferred Volume:
3 mL CSF

Minimum Volume:
1.1 mL CSF

Rejection Criteria:
Specimen collected using heparin as anticoagulant. Leaking, uncapped or broken containers.

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 16186.

Units:
Copies/mL & Log copies/mL

Reference Interval:
<20 copies/mL
< 1.30 log copies/mL

**Stability (from collection to initiation):**
- Room temperature 1 day, refrigerated 6 days, frozen 42 days

**Reported:**
- 3-5 days

**Additional Information:**
This test is intended for use in conjunction with clinical presentation and other laboratory markers of disease progress for the clinical management of HIV-1 infected patients. The test can be used to assess patient prognosis by measuring the baseline HIV-1 RNA level or to monitor the effects of antiretroviral therapy by measuring changes in EDTA plasma HIV-1 RNA levels during the course of antiretroviral treatment.

**CPT Codes:**
- 87536-90

**LOINC Codes:**
- 41497-9, 41498-7
HIV-1 RNA, Qualitative, TMA

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: TMA

Additional Information:
The APTIMA® HIV-1 RNA, Qualitative assay may be used:
1. As an aid in the diagnosis of acute and primary HIV-1 infection.
2. To confirm HIV-1 infection in persons who repeatedly test positive for HIV-1 infection.
3. To resolve indeterminate or inconclusive HIV-1 Western blot results.

COLLECTION

Sample Type: Serum or plasma
Collect:
Gold top, Red top, Lavender top, Blue top
Amount to Collect:
3.2 mL
Preferred Volume:
1.6 mL
Minimum Volume:
0.6 mL
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen 35 days

PROCESSING

Test Code: HIV1T
Test Group: HIV
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Aliquot of freeze. Send to CB frozen, Order Quest code 16185.
Preferred Volume:
1.6 mL
Minimum Volume:
0.6 mL
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen 35 days

RESULT INTERPRETATION

Reference Interval:
Not detected

Additional Information:

The APTIMA® HIV-1 RNA, Qualitative assay may be used:
1. As an aid in the diagnosis of acute and primary HIV-1 infection.
2. To confirm HIV-1 infection in persons who repeatedly test positive for HIV-1 infection.
3. To resolve indeterminate or inconclusive HIV-1 Western blot results.

CPT Codes:
87535-90

LOINC Codes:
25835-0

COMPLETE VIEW

Available Stat:
No

Test Code:
HIV1T

Test Group:
HIV

Performing Lab:
Quest

Sendout:
Yes

Methodology:
TMA

Collect:
Gold top, Red top, Lavender top, Blue top

Amount to Collect:
3.2 mL

Sample Type:
Serum or plasma

Preferred Volume:
1.6 mL

Minimum Volume:
0.6 mL

Specimen Preparation:
Aliquot of freeze. Send to CB frozen, Order Quest code 16185.

Reference Interval:
Not detected

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen 35 days

Additional Information:

The APTIMA® HIV-1 RNA, Qualitative assay may be used:
1. As an aid in the diagnosis of acute and primary HIV-1 infection.
2. To confirm HIV-1 infection in persons who repeatedly test positive for HIV-1 infection.
3. To resolve indeterminate or inconclusive HIV-1 Western blot results.

CPT Codes:
87535-90

LOINC Codes:
25835-0
HIV-1 RNA, Quantitative

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Methodology:
RT-PCR
Reported:
Performed 2x per week. Turnaround time: 3-7 days.
Additional Information:
This test is FDA approved for monitoring patients with a known diagnosis of HIV. This test is generally not used to establish a diagnosis of HIV. However, in the setting of acute HIV, if the antibody test is negative or equivocal, a high viral load is often present. If ordered for diagnostic purposes the provider should sign in the attestation area of the ID Serology and Molecular Testing requisition to document that patient consent was obtained.

High off-scale results are routinely reported as > 1,000,000 copies/mL or > 6.0 log copies/mL.

Low level results where HIV RNA is detected by the assay but not quantifiable are reported as 'Detected' with a result <40 copies/mL or <1.60 log copies/mL.

'<40 copies/mL, Not Detected' or <1.60 log copies/mL, Not Detected' is reported when no HIV RNA can be detected by the assay. This result should not imply the patient is not infected with HIV. Viral loads less than 40 copies/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

COLLECTION

Sample Type:
EDTA Plasma
Collect:
Pearl White top preferred, Lavender top acceptable
Amount to Collect:
8.5 mL blood
Preferred Volume:
3 mL plasma
Minimum Volume:
1.5 mL plasma (this volume is insufficient for repeat testing)
Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 1 day, frozen at -20C 35 days
Unacceptable Conditions:
Heparinized samples

PROCESSING

Test Code:
HIVRT
Test Group:
HIV
Performing Lab:
Immunology
Specimen Preparation:
Centrifuge and freeze Pearl White tube within 6 hours at -70C.

If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70C.

Preferred Volume:
3 mL plasma

Minimum Volume:
1.5 mL plasma (this volume is insufficient for repeat testing)

Unacceptable Conditions:
Heparinized samples

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 1 day, frozen at -20C 35 days

RESULT INTERPRETATION

Units:
copies/mL or log copies/mL

Reference Interval:
<40 copies/mL
<1.60 log copies/mL

Additional Information:
This test is FDA approved for monitoring patients with a known diagnosis of HIV. This test is generally not used to establish a diagnosis of HIV. However, in the setting of acute HIV, if the antibody test is negative or equivocal, a high viral load is often present. If ordered for diagnostic purposes the provider should sign in the attestation area of the ID Serology and Molecular Testing requisition to document that patient consent was obtained.

High off-scale results are routinely reported as > 1,000,000 copies/mL or > 6.0 log copies/mL.

Low level results where HIV RNA is detected by the assay but not quantifiable are reported as ‘Detected’ with a result <40 copies/mL or <1.60 log copies/mL.

‘<40 copies/mL, Not Detected’ or ‘<1.60 log copies/mL, Not Detected’ is reported when no HIV RNA can be detected by the assay. This result should not imply the patient is not infected with HIV. Viral loads less than 40 copies/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

ADMINISTRATIVE

CPT Codes:
87536

COMPLETE VIEW

Available Stat:
No

Test Code:
HIVRT

Test Group:
HIV

Performing Lab:
Immunology

Methodology:
RT-PCR

Collect:
Pearl White top preferred, Lavender top acceptable
Amount to Collect:
8.5 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
3 mL plasma

Minimum Volume:
1.5 mL plasma (this volume is insufficient for repeat testing)

Unacceptable Conditions:
Heparinized samples

Specimen Preparation:
Centrifuge and freeze Pearl White tube within 6 hours at -70C.

If Lavender top received, centrifuge and separate plasma within 6 hours of collection. Freeze plasma at -70C.

Units:
copies/mL or log copies/mL

Reference Interval:
<40 copies/mL
<1.60 log copies/mL

Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 1 day, frozen at -20C 35 days

Reported:
Performed 2x per week. Turnaround time: 3-7 days.

Additional Information:
This test is FDA approved for monitoring patients with a known diagnosis of HIV. This test is generally not used to establish a diagnosis of HIV. However, in the setting of acute HIV, if the antibody test is negative or equivocal, a high viral load is often present. If ordered for diagnostic purposes the provider should sign in the attestation area of the ID Serology and Molecular Testing requisition to document that patient consent was obtained.

High off-scale results are routinely reported as > 1,000,000 copies/mL or > 6.0 log copies/mL.

Low level results where HIV RNA is detected by the assay but not quantifiable are reported as 'Detected' with a result <40 copies/mL or <1.60 log copies/mL.

'<=40 copies/mL, Not Detected' or '<1.60 log copies/mL, Not Detected' is reported when no HIV RNA can be detected by the assay. This result should not imply the patient is not infected with HIV. Viral loads less than 40 copies/mL will not be reliably detected by this assay. Correlation with clinical findings and serologic results are recommended.

Positive results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
87536
HLA Antibody Specificity - Class I
HTSL1 (Sunquest: ILLS1)

ORDERING
Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
- Class I Single Antigen Testing by Luminex, Single Antigen Specificity Class I

COLLECTION
Sample Type:
Serum
Collect:
Red top x 2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL serum
Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide here
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING
Test Code:
HTSL1 (Sunquest: ILLS1)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

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**RESULT INTERPRETATION**

**Additional Information:**
- This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
- 86832

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**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTSL1 (Sunquest: ILLS1)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**
- For additional collection information, please refer to the ITL Sample Collection Guide [here](#)  
  ITL (415) 476-3387

**Collect:**
- Red top x 2

**Amount to Collect:**
- 12 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 6 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class I Single Antigen Testing by Luminex, Single Antigen Specificity Class I

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific HLA Class I antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:
86832
HLA Antibody Specificity - Class II
HTLS2 (Sunquest: ILLS2)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Luminex-based

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

Reflex Testing:
Yes

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum

Collect:
Red top x2

Amount to Collect:
12 mL blood

Preferred Volume:
6 mL serum

Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide here

ITL (415) 476-3387

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTLS2 (Sunquest: ILLS2)

Test Group:
HLA Antibody Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

RESULT INTERPRETATION

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:
86833

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTLS2 (Sunquest: ILLS2)

Test Group:
HLA Antibody Testing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Luminex-based

Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide here

ITL (415) 476-3387

Collect:
Red top x2

Amount to Collect:
12 mL blood

Sample Type:
Serum

Preferred Volume:
6 mL serum

Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Reflex Testing:
Additional Information:

This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:

86833
HLA Antibody Testing - Class I PRA
HTPRA1 (Sunquest: ILPRA1)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
- Class I PRA by Luminex, PRA Class I

COLLECTION

Sample Type:
Serum
Collect:
Red top x 2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL serum
Minimum Volume:
1.25 mL serum
Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide here
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTPRA1 (Sunquest: ILPRA1)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
- 6 mL serum

**Minimum Volume:**
- 1.25 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

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**RESULT INTERPRETATION**

**Additional Information:**
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
- 86830

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**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTPRA1 (Sunquest: ILPRA1)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**
For additional collection information, please refer to the ITL Sample Collection Guide [here](#).

ITL (415) 476-3387

**Collect:**
- Red top x 2

**Amount to Collect:**
- 12 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 6 mL serum

**Minimum Volume:**
- 1.25 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
Class I PRA by Luminex, PRA Class I

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Reflex Testing:
Yes

Additional Information:
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:
86830
HLA Antibody Testing - Class II PRA
HTPRA2 (Sunquest: ILPRA2)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Luminex-based

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Additional Information:
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

Reflex Testing:
Yes

Synonyms:
- Class I PRA by Luminex, PRA Class II

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
12 mL blood

Preferred Volume:
6 mL serum

Minimum Volume:
1.25 mL serum

Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide [here](#)

ITL (415) 476-3387

PROCESSING

Test Code:
HTPRA2 (Sunquest: ILPRA2)

Test Group:
HLA Antibody Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
6 mL serum

Minimum Volume:
RESULT INTERPRETATION

Additional Information:
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:
86831

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTPRA2 (Sunquest: ILPRA2)
Test Group:
HLA Antibody Testing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Luminex-based
Remarks:
For additional collection information, please refer to the ITL Sample Collection Guide here
ITL (415) 476-3387
Collect:
Red top
Amount to Collect:
12 mL blood
Sample Type:
Serum
Preferred Volume:
6 mL serum
Minimum Volume:
1.25 mL serum
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Synonyms:
- Class I PRA by Luminex, PRA Class II
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Reflex Testing:
Yes
Additional Information:
This test detects sensitization to HLA Class I antigens through blood transfusion, organ transplantation, pregnancy, etc. It is reported as a percentage of positive cells in a panel. In addition to solid organ testing protocols, this test can be requested for evaluation of refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
CPT Codes:
**ORDERING**

**Available Stat:**
Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
- Molecular - SSP/SSOP

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

**COLLECTION**

**Sample Type:**
- ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
- Yellow top (ACD)

**Amount to Collect:**
- 8.5 mL blood

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**
- Please see ITL Sample Collection Guide [here](#).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**Rejection Criteria:**
- WBC count too low (<1,000)

**PROCESSING**

**Test Code:**
- HTCELIAC (Sunquest: ILCEL)

**Test Group:**
- HLA Typing

**Sendout:**
Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Rejection Criteria:**
- WBC count too low (<1,000)

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.
CPT Codes:
   81373

Available Stat:
   Yes
Test Code:
   HTCELIAC (Sunquest: ILCEL)
Test Group:
   HLA Typing
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
   Yes
Methodology:
   Molecular - SSP/SSOP
Remarks:
   Please see ITL Sample Collection Guide here.
Collect:
   Yellow top (ACD)
Amount to Collect:
   8.5 mL blood
Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887
Rejection Criteria:
   WBC count too low (<1,000)
Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
CPT Codes:
   81373
HLA Class I Typing - Intermediate resolution
HTSSP (Sunquest: ILC1IR)

ORDERING
Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION
Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING
Test Code: HTSSP (Sunquest: ILC1IR)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTSSP (Sunquest: ILC1IR)
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular -SBT
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
81382
**HLA Class II Typing - Intermediate resolution**

**HTEXG (Sunquest: ILC2IR)**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SBT

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for >72 hours

**Unacceptable Conditions:**
WBC count too low (<1,000)

### PROCESSING

**Test Code:**
HTEXG (Sunquest: ILC2IR)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
WBC count too low (<1,000)
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
   81382

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   HTEXG (Sunquest: ILC2IR)
Test Group:
   HLA Typing
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
   Yes
Methodology:
   Molecular -SBT
Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS
   ITL (415) 476-3387
Collect:
   Yellow top (ACD)
Amount to Collect:
   8.5 mL blood
Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)
Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
   81382
HLA-A High Resolution Typing
HTSEA (Sunquest: ILSEA)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular -SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions: WBC count too low (<1,000)

PROCESSING

Test Code: HTSEA (Sunquest: ILSEA)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions: WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

**ADMINISTRATIVE**

CPT Codes:
81380

**COMPLETE VIEW**

Available Stat:
Yes

Test Code:
HTSEA (Sunquest: ILSEA)

Test Group:
HLA Typing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Molecular -SBT

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81380
**HLA-A Typing - Intermediate Resolution**

**HTALD (Sunquest: ILALD)**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SSP/SSOP

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

**Synonyms:**
- HLA-A Typing by SSP/SSOP

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**Unacceptable Conditions:**
WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

### PROCESSING

**Test Code:**
HTALD (Sunquest: ILALD)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887
**Unacceptable Conditions:**
- WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**ADMINISTRATIVE**

**CPT Codes:**
- 81373

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTALD (Sunquest: ILALD)

**Test Group:**
- HLA Typing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Molecular - SSP/SSOP

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
- Yellow top (ACD)

**Amount to Collect:**
- 8.5 mL blood

**Sample Type:**
- ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
- WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Synonyms:**
- HLA-A Typing by SSP/SSOP

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

**CPT Codes:**
- 81373
**HLA-A2 Typing**

**ILA2**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SSP/SSOP

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**
Please see ITL Sample Collection Guide [here](#).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**Rejection Criteria:**
WBC count too low (<1,000)

### PROCESSING

**Test Code:**
HTA2 (Sunquest: ILA2)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Rejection Criteria:**
WBC count too low (<1,000)

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.
ADMINISTRATIVE

CPT Codes:

81373

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTA2 (Sunquest: ILA2)

Test Group:
HLA Typing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Molecular - SSP/SSOP

Remarks:
Please see ITL Sample Collection Guide here.

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:
81373
**HLA-A68 Typing**

**ILA68**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SSP/SSOP

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**
Please see ITL Sample Collection Guide [here](#).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

**Rejection Criteria:**
WBC count too low (<1,000)

### PROCESSING

**Test Code:**
HTA68 (Sunquest: ILA68)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Rejection Criteria:**
WBC count too low (<1,000)

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.
ADMINISTRATIVE

CPT Codes:

81373

COMPLETE VIEW

Available Stat:

Yes

Test Code:

HTA68 (Sunquest: ILA68)

Test Group:

HLA Typing

Performing Lab:

Immunogenetics & Transplantation Laboratory (ITL)

Sendout:

Yes

Methodology:

Molecular - SSP/SSOP

Remarks:

Please see ITL Sample Collection Guide [here](#).

Collect:

Yellow top (ACD)

Amount to Collect:

8.5 mL blood

Sample Type:

ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:

8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:

1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:

WBC count too low (<1,000)

Specimen Preparation:

Keep sample at Room Temperature, DO NOT refrigerator or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):

If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

Reported:

Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:

81373
HLA-ABC Typing - Intermediate Resolution
ILSSP

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SSP/SSOP
Reported: Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
Synonyms:
- Class I Typing by SSP/SSOP, HLA Typing Class I

COLLECTION

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good up to 72 hours
Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING

Test Code: ILSSP
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)

Stability (from collection to initiation):
   If kept at ambient temperature, can be good up to 72 hours

ADMINISTRATIVE

CPT Codes:
   81372

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   ILSSP
Test Group:
   HLA Typing
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
   Yes
Methodology:
   Molecular - SSP/SSOP
Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS

   ITL (415) 476-3387
Collect:
   Yellow top (ACD)
Amount to Collect:
   8.5 mL blood
Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)
Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Synonyms:
   • Class I Typing by SSP/SSOP, HLA Typing Class I
Stability (from collection to initiation):
   If kept at ambient temperature, can be good up to 72 hours
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
CPT Codes:
   81372
**HLA-B High Resolution Typing**
HTSEB (Sunquest: ILSEB)

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SBT

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**
ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for >72 hours

**Unacceptable Conditions:**
WBC count too low (<1,000)

### PROCESSING

**Test Code:**
HTSEB (Sunquest: ILSEB)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

**ADMINISTRATIVE**

CPT Codes:
81380

**COMPLETE VIEW**

Available Stat:
Yes

**Test Code:**
HTSEB (Sunquest: ILSEB)

**Test Group:**
HLA Typing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Molecular -SBT

**Remarks:**
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
WBC count too low (<1,000)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for >72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81380
HLA-B Typing - Intermediate Resolution
HTBLD (Sunquest: ILBLD)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SSP/SSOP
Reported: Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
Synonyms:
- HLA-B Typing by SSP/SSOP

COLLECTION

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

Unacceptable Conditions:
WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

PROCESSING

Test Code:
HTBLD (Sunquest: ILBLD)

Test Group:
HLA Typing

Sendout: Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
  WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

ADMINISTRATIVE

CPT Codes:
  81373

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  HTBLD (Sunquest: ILBLD)
Test Group:
  HLA Typing
Performing Lab:
  Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
  Yes
Methodology:
  Molecular - SSP/SSOP
Remarks:
  SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
  Yellow top (ACD)
Amount to Collect:
  8.5 mL blood
Sample Type:
  ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
  8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
  1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
  WBC count too low (<1,000). For other specimens, contact ITL at 6-3387.

Specimen Preparation:
  Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Synonyms:
  - HLA-B Typing by SSP/SSOP

Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

Reported:
  Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:
  81373
# HLA-B*1502 Typing

**HT1502 (Sunquest: IL1502)**

## ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
- Molecular - SSP/SSOP/SBT

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Synonyms:**
- HLA-B High Resolution Typing for Carbamazepine sensitivity

## COLLECTION

**Sample Type:**
- ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
- Yellow top (ACD)

**Amount to Collect:**
- 8.5 mL blood

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**
- **SAMPLE COLLECTION GUIDE FOR ITL TESTS**

  ITL (415) 476-3387

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for >72 hours

**Unacceptable Conditions:**
- WBC count too low (<1,000)

## PROCESSING

**Test Code:**
- HT1502 (Sunquest: IL1502)

**Test Group:**
- HLA Typing

**Sendout:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
   81381

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   HT1502 (Sunquest: IL1502)
Test Group:
   HLA Typing
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
   Yes
Methodology:
   Molecular - SSP/SSOP/SBT
Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS

   ITL (415) 476-3387
Collect:
   Yellow top (ACD)
Amount to Collect:
   8.5 mL blood
Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
   WBC count too low (<1,000)
Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Synonyms:
   • HLA-B High Resolution Typing for Carbamazepine sensitivity
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
   81381
**HLA-B*5701 Typing**

HT5701 (Sunquest: IL5701)

### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
- Molecular - SSP/SSOP/SBT

**Reported:**
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Synonyms:**
- HLA-B High Resolution Typing for Abacavir sensitivity

### COLLECTION

**Sample Type:**
- ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
- Yellow top (ACD)

**Amount to Collect:**
- 8.5 mL blood

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3387

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**
- **SAMPLE COLLECTION GUIDE FOR ITL TESTS**

  ITL (415) 476-3387

  **Stability (from collection to initiation):**
  - If kept at ambient temperature, can be good for >72 hours

  **Unacceptable Conditions:**
  - WBC count too low (<1,000)

### PROCESSING

**Test Code:**
- HT5701 (Sunquest: IL5701)

**Test Group:**
- HLA Typing

**Sendout:**
- Yes

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
- 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours

Administrative

CPT Codes:
   81381

Complete View

Available Stat:
   Yes

Test Code:
   HT5701 (Sunquest: IL5701)

Test Group:
   HLA Typing

Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
   Yes

Methodology:
   Molecular - SSP/SSOP/SBT

Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS

   ITL (415) 476-3387

Collect:
   Yellow top (ACD)

Amount to Collect:
   8.5 mL blood

Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
   WBC count too low (<1,000)

Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Synonyms:
   - HLA-B High Resolution Typing for Abacavir sensitivity

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours

Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
   81381
HLA-B*5801 Typing
IL5801

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Molecular - SBT

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Remarks:
Please see ITL Sample Collection Guide here.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

Rejection Criteria:
WBC count too low (<1,000)

PROCESSING

Test Code:
HT5801 (Sunquest: IL5801)

Test Group:
HLA Typing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
ADMINISTRATIVE

CPT Codes:

81380

COMPLETE VIEW

Available Stat:

Yes

Test Code:

HT5801 (Sunquest: IL5801)

Test Group:

HLA Typing

Performing Lab:

Immunogenetics & Transplantation Laboratory (ITL)

Sendout:

Yes

Methodology:

Molecular - SBT

Remarks:

Please see ITL Sample Collection Guide [here](#).

Collect:

Yellow top (ACD)

Amount to Collect:

8.5 mL blood

Sample Type:

ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:

8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:

1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:

WBC count too low (<1,000)

Stability (from collection to initiation):

If kept at ambient temperature, can be good for >72 hours

Reported:

Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:

81380
HLA-B27 Typing
HTB27 (Sunquest: ILB27)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Molecular - SSP/SSOP

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

Synonyms:
- HLA Typing for Ankylosing Spondylitis

COLLECTION

Sample Type:
ACD anticoagulated whole blood

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Preferred Volume:
8.5 mL blood

Minimum Volume:
1 mL blood

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING

Test Code:
HTB27 (Sunquest: ILB27)

Test Group:
HLA Typing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
8.5 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):

If kept at ambient temperature, can be good for up to 72 hours

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**ADMINISTRATIVE**

CPT Codes:

81374

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**COMPLETE VIEW**

Available Stat:  
Yes

Test Code:  
HTB27 (Sunquest: ILB27)

Test Group:  
HLA Typing

Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:  
Yes

Methodology:  
Molecular - SSP/SSOP

Remarks:  
**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

Collect:  
Yellow top (ACD)

Amount to Collect:  
8.5 mL blood

Sample Type:  
ACD anticoagulated whole blood

Preferred Volume:  
8.5 mL blood

Minimum Volume:  
1 mL blood

Unacceptable Conditions:  
WBC count too low (<1,000)

Specimen Preparation:  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:  
- HLA Typing for Ankylosing Spondylitis

Stability (from collection to initiation):  
If kept at ambient temperature, can be good for up to 72 hours

Reported:  
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:  
81374
HLA-B51-Typing
ILB51

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks: Please see ITL Sample Collection Guide here.
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
Rejection Criteria: WBC count too low (<1,000)

PROCESSING

Test Code: HTB51 (Sunquest: ILB51)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Rejection Criteria: WBC count too low (<1,000)
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
**ADMINISTRATIVE**

CPT Codes:
- 81380

**COMPLETE VIEW**

Available Stat:
- Yes

Test Code:
- HTB51 (Sunquest: ILB51)

Test Group:
- HLA Typing

Performing Lab:
- Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
- Yes

Methodology:
- Molecular - SBT

Remarks:
- Please see ITL Sample Collection Guide [here](#).

Collect:
- Yellow top (ACD)

Amount to Collect:
- 8.5 mL blood

Sample Type:
- ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
- 8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
- 1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:
- WBC count too low (<1,000)

Specimen Preparation:
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
- If kept at ambient temperature, can be good for >72 hours

Reported:
- Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
- 81380
HLA-C High Resolution Typing
HTSEC (Sunquest: ILSEC)

ORDERING

Available Stat: 
Yes
Performing Lab: 
Immunogenetics & Transplantation Laboratory (ITL)
Methodology: 
Molecular - SBT
Reported: 
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type: 
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: 
Yellow top (ACD)
Amount to Collect: 
8.5 mL blood
Preferred Volume: 
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 
1 mL blood; for other specimens, contact ITL at 6-3887
Remarks: 
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation): 
If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions: 
WBC count too low (<1,000)

PROCESSING

Test Code: 
HTSEC (Sunquest: ILSEC)
Test Group: 
HLA Typing
Sendout: 
Yes
Performing Lab: 
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: 
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions: 
WBC count too low (<1,000)
Stability (from collection to initiation):
  If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
  81380

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  HTSEC (Sunquest: ILSEC)
Test Group:
  HLA Typing
Performing Lab:
  Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
  Yes
Methodology:
  Molecular -SBT
Remarks:
  SAMPLE COLLECTION GUIDE FOR ITL TESTS
  ITL (415) 476-3387
Collect:
  Yellow top (ACD)
Amount to Collect:
  8.5 mL blood
Sample Type:
  ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
  8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
  1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
  WBC count too low (<1,000)
Specimen Preparation:
  Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
  If kept at ambient temperature, can be good for >72 hours
Reported:
  Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
  81380
HLA-C Typing - Intermediate Resolution
HTCLD (Sunquest: ILCLD)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SSP/SSOP
Reported: Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
Synonyms: HLA-C Typing by SSP/SSOP, HLA-Cw Typing

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks: SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation): If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.
Unacceptable Conditions: WBC count too low (<1,000)

PROCESSING

Test Code: HTCLD (Sunquest: ILCLD)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

ADMINISTRATIVE

CPT Codes:
   81373

COMPLETE VIEW

Available Stat:
   Yes

Test Code:
   HTCLD (Sunquest: ILCLD)

Test Group:
   HLA Typing

Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
   Yes

Methodology:
   Molecular - SSP/SSOP

Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS
   ITL (415) 476-3387

Collect:
   Yellow top (ACD)

Amount to Collect:
   8.5 mL blood

Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
   WBC count too low (<1,000)

Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerator or centrifuge. For other specimens, contact ITL at 6-3387.

Synonyms:
   HLA-C Typing by SSP/SSOP, HLA-Cw Typing

Stability (from collection to initiation):
   If kept at ambient temperature, can be good for up to 72 hours. For other specimens, contact ITL at 6-3387.

Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:
   81373
HLA-Comprehensive High Resolution Typing
ILCOM

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks: Please see ITL Sample Collection Guide here.
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
Rejection Criteria: WBC count too low (<1,000)

PROCESSING

Test Code: HTCOMPHLA (Sunquest: ILCOM)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Rejection Criteria: WBC count too low (<1,000)
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
CPT Codes:
81380

Available Stat:
Yes

Test Code:
HTCOMPHLA (Sunquest: ILCOM)

Test Group:
HLA Typing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Molecular - SBT

Remarks:
Please see ITL Sample Collection Guide [here](#).

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Rejection Criteria:
WBC count too low (< 1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for > 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days

CPT Codes:
81380
HLA-DPA1 High Resolution Typing
HTDPA (Sunquest: ILDPA)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks: SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation): If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions: WBC count too low (<1,000)

PROCESSING

Test Code: HTDPA (Sunquest: ILDPA)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions: WBC count too low (<1,000)

Test information subject to change
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
   81382

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   HTDPA (Sunquest: ILDPA)
Test Group:
   HLA Typing
Performing Lab:
   Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
   Yes
Methodology:
   Molecular -SBT
Remarks:
   SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Collect:
   Yellow top (ACD)
Amount to Collect:
   8.5 mL blood
Sample Type:
   ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
   8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
   1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
   WBC count too low (<1,000)
Specimen Preparation:
   Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
   If kept at ambient temperature, can be good for >72 hours
Reported:
   Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
   81382
**HLA-DPB1 High Resolution Typing**

**HTDPB (Sunquest: ILDPB)**

### ORDERING

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Molecular - SBT

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

### COLLECTION

**Sample Type:**
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

**Collect:**
Yellow top (ACD)

**Amount to Collect:**
8.5 mL blood

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for >72 hours

**Unacceptable Conditions:**
WBC count too low (<1,000)

### PROCESSING

**Test Code:**
HTDPB (Sunquest: ILDPB)

**Test Group:**
HLA Typing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

**Preferred Volume:**
8.5 mL blood; for other specimens, contact ITL at 6-3887

**Minimum Volume:**
1 mL blood; for other specimens, contact ITL at 6-3887

**Unacceptable Conditions:**
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTDPB (Sunquest: ILDPB)
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular -SBT
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
81382
HLA-DQA1 High Resolution Typing
HTDQA (Sunquest: ILDQA)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Molecular - SBT
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING

Test Code:
HTDQA (Sunquest: ILDQA)
Test Group:
HLA Typing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Stability (from collection to initiation):

If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HTDQA (Sunquest: ILDQA)

Test Group:
HLA Typing

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Molecular -SBT

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

CPT Codes:
81382
HLA-DQB1 High Resolution Typing
HTDQB (Sunquest: ILDQB)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SBT
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING

Test Code: HTDQB (Sunquest: ILDQB)
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTDQB (Sunquest: ILDQB)
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular -SBT
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
81382
HLA-DR/DQ Typing - Intermediate Resolution
ILEXG

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SSP/SSOP
Reported: Test run Monday - Friday. Expected TAT for routine test is < 8 working days.
Synonyms:
- Class II Typing by SSP/SSOP

COLLECTION

Sample Type: ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume: 1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387

Stability (from collection to initiation):
If kept at ambient temperature, can be good up to 72 hours
Unacceptable Conditions:
- WBC count too low (<1,000)

PROCESSING

Test Code: ILEXG
Test Group: HLA Typing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume:
- 8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
- 1 mL blood; for other specimens, contact ITL at 6-3887

Test information subject to change
Unacceptable Conditions:
WBC count too low (<1,000)

Stability (from collection to initiation):
If kept at ambient temperature, can be good up to 72 hours

ADMINISTRATIVE

CPT Codes:
81375

COMPLETE VIEW

Available Stat:
Yes
Test Code:
ILEXG
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular - SSP/SSOP
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
WBC count too low (<1,000)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Synonyms:
- Class II Typing by SSP/SSOP

Stability (from collection to initiation):
If kept at ambient temperature, can be good up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 8 working days.

CPT Codes:
81375
HLA-DRB1 High Resolution Typing
HTSED (Sunquest: ILSED)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Molecular - SBT

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.

Collect:
Yellow top (ACD)

Amount to Collect:
8.5 mL blood

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

Unacceptable Conditions:
WBC count too low (<1,000)

PROCESSING

Test Code:
HTSED (Sunquest: ILSED)

Test Group:
HLA Typing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.

Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887

Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887

Unacceptable Conditions:
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE

CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTSED (Sunquest: ILSED)
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular -SBT
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Sample Type:
ACD anticoagulated whole blood; contact ITL at 6-3887 for other specimens such as amniotic fluid, bone marrow aspirate, buccal mucosa, cord blood, cultured cells, DNA, whole blood spotted on filter paper, etc.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Unacceptable Conditions:
WBC count too low (<1,000)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
81382
HLA-DRB3/4/5 High Resolution Typing
ILDRB

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Molecular -SSP/SBT
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

COLLECTION

Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Remarks:
Please see ITL Sample Collection Guide here.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Rejection Criteria:
WBC count too low (<1,000)

PROCESSING

Test Code:
HTDRB345 (Sunquest: ILDRB)
Test Group:
HLA Typing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Rejection Criteria:
WBC count too low (<1,000)
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours

ADMINISTRATIVE
CPT Codes:
81382

COMPLETE VIEW

Available Stat:
Yes
Test Code:
HTDRB345 (Sunquest: ILDRB)
Test Group:
HLA Typing
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
Yes
Methodology:
Molecular -SSP/SBT
Remarks:
Please see ITL Sample Collection Guide here.
Collect:
Yellow top (ACD)
Amount to Collect:
8.5 mL blood
Preferred Volume:
8.5 mL blood; for other specimens, contact ITL at 6-3887
Minimum Volume:
1 mL blood; for other specimens, contact ITL at 6-3887
Rejection Criteria:
WBC count too low (<1,000)
Specimen Preparation:
Keep sample at Room Temperature. DO NOT refrigerate or centrifuge. For other specimens, contact ITL at 6-3387.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for >72 hours
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
CPT Codes:
81382
Hold SNP Array
HSNPA

ORDERING

Approval Required:  
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff. Insurance authorization required for outpatients.

Available Stat:  
No

Performing Lab:  
Medical Genomics - Cytogenetics (Microarray)

Performed:  
N/A

Methodology:  
N/A

Additional Information:  
The sample will be retained for two (2) weeks from the time of collection pending receipt of the payer authorization. If authorization is not received by the laboratory in that timeframe the sample will be discarded.

This test should be ordered only when:
(1) The patient is present to have their sample collected and it would be problematic for the patient to return AND there has not yet been authorization received from the patient's insurer that they will reimburse for a SNP array to be performed.
(2) If routine chromosome analysis is desired prior to performing the array as this will obviate the need to collect another sample for array testing.

For questions, contact the microarray laboratory at 514-8964

Microarray results are reported based on the human genome build 19 (hg19/GRCh37). Cases prior December 1st, 2011, were reported based on hg18/NCBI36. Which human genome build is used must be noted when looking up regions in publicly available databases.

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

Synonyms:  
- Hold for authorization
- Hold for approval
- Hold for insurance authorization
- Hold for insurance approval
- Microarray

COLLECTION

Sample Type:  
EDTA or Heparinized whole blood, Extracted DNA

Collect:  
Lavender top preferred, Dark Green top acceptable

Amount to Collect:  
Adult: 5 mL blood
Infant/child: 3 mL blood

Preferred Volume:  
Adult: 5 mL blood
Infant/Child: 3 mL blood
Extracted DNA: 10 µg (mcg)

Minimum Volume:
Adult: 2 mL blood
Infant/Child: 2 mL blood
Extracted DNA: 10 µg (mcg)

Remarks:
Insurance pre-authorization required for outpatients
Only collect samples Monday - Friday and avoid holidays.
Do not collect sample in lithium heparin (Lt. Green top).
Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Note: Samples will only be held for 2 weeks pending insurance authorization.

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks.

Unacceptable Conditions:
Unlabeled sample, insufficient sample, clotted samples, samples received in Lithium-heparin (Lt. Green top)

PROCESSING

Test Code:
HSNPA

Test Group:
Microarray

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Specimen Preparation:
Refrigerate samples DO NOT CENTRIFUGE OR FREEZE. Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

Preferred Volume:
Adult: 5 mL blood
Infant/Child: 3 mL blood
Extracted DNA: 10 µg (mcg)

Minimum Volume:
Adult: 2 mL blood
Infant/Child: 2 mL blood
Extracted DNA: 10 µg (mcg)

Unacceptable Conditions:
Unlabeled sample, insufficient sample, clotted samples, samples received in Lithium-heparin (Lt. Green top)

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks.

RESULT INTERPRETATION

Reference Interval:
Normal

Additional Information:
The sample will be retained for two (2) weeks from the time of collection pending receipt of the payer authorization. If authorization is not received by the laboratory in that time frame the sample will be discarded.

This test should be ordered only when:
(1) The patient is present to have their sample collected and it would be problematic for the patient to return AND there has not yet been authorization received from the patient’s insurer that they will reimburse for a SNP array to be performed.
(2) If routine chromosome analysis is desired prior to performing the array as this will obviate the need to collect another sample for
array testing.

For questions, contact the microarray laboratory at 514-8964

Microarray results are reported based on the human genome build 19 (hg19/GRCh37). Cases prior December 1st, 2011, were reported based on hg18/NCBI36. Which human genome build is used must be noted when looking up regions in publicly available databases.

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

COMPLETE VIEW

Approval Required:
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff. Insurance authorization required for outpatients.

Available Stat:
No

Test Code:
HSNPA

Test Group:
Microarray

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Performed:
N/A

Methodology:
N/A

Remarks:
Insurance pre-authorization required for outpatients

Only collect samples Monday - Friday and avoid holidays.

Do not collect sample in lithium heparin (Lt. Green top).

Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Note: Samples will only be held for 2 weeks pending insurance authorization.

Collect:
Lavender top preferred, Dark Green top acceptable

Amount to Collect:
Adult: 5 mL blood
Infant/child: 3 mL blood

Sample Type:
EDTA or Heparinized whole blood, Extracted DNA

Preferred Volume:
Adult: 5 mL blood
Infant/Child: 3 mL blood
Extracted DNA: 10 µg (mcg)

Minimum Volume:
Adult: 2 mL blood
Infant/Child: 2 mL blood
Extracted DNA: 10 µg (mcg)

Unacceptable Conditions:
Unlabeled sample, insufficient sample, clotted samples, samples received in Lithium-heparin (Lt. Green top)
Specimen Preparation:
Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE**. Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

Reference Interval:
Normal

Synonyms:
- Hold for authorization
- Hold for approval
- Hold for insurance authorization
- Hold for insurance approval
- Microarray

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks.

Additional Information:
The sample will be retained for two (2) weeks from the time of collection pending receipt of the payer authorization. If authorization is not received by the laboratory in that time frame the sample will be discarded.

This test should be ordered only when:
(1) The patient is present to have their sample collected and it would be problematic for the patient to return AND there has not yet been authorization received from the patient's insurer that they will reimburse for a SNP array to be performed.
(2) If routine chromosome analysis is desired prior to performing the array as this will obviate the need to collect another sample for array testing.

For questions, contact the microarray laboratory at 514-8964

Microarray results are reported based on the human genome build 19 (hg19/GRCh37). Cases prior December 1st, 2011, were reported based on hg18/NCBI36. Which human genome build is used must be noted when looking up regions in publicly available databases.

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)
Hold Specimen
HSFD

ORDERING

Available Stat:
No
Performing Lab:
Central Processing
Additional Information:
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C. Specimens are held for 2 weeks only. HSFD covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

COLLECTION

Sample Type:
blood, urine, CSF or other body fluid
Collect:
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container
Amount to Collect:
5 mL blood

PROCESSING

Test Code:
HSFD
Performing Lab:
Central Processing
Specimen Preparation:
If sample type is blood, spin sample first and aliquot plasma or serum. Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

RESULT INTERPRETATION

Additional Information:
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C. Specimens are held for 2 weeks only. HSFD covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

ADMINISTRATIVE

CPT Codes:
99001

COMPLETE VIEW

Available Stat:
No
Test Code:
HSFD
Performing Lab:
Central Processing
Collect:
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container
Amount to Collect:
5 mL blood

Sample Type:

- blood, urine, CSF or other body fluid

Specimen Preparation:

- If sample type is blood, spin sample first and aliquot plasma or serum. Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

Additional Information:

- If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C. Specimens are held for 2 weeks only. HSFD covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

CPT Codes:

- 99001
Hold specimen frozen
HSFZ

ORDERING

Available Stat: 
No
Performing Lab:  
Parnassus, Mission Bay and Mt. Zion Central Processing
Additional Information:  
If sample storage instructions are not included, sample will be stored refrigerated at 2-8C.
Specimens are held for 2 weeks only.
HSFZ covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

COLLECTION

Sample Type:  
Blood, urine, CSF or other body fluid
Collect:  
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

PROCESSING

Test Code:  
HSFZ
Performing Lab:  
Parnassus, Mission Bay and Mt. Zion Central Processing
Specimen Preparation:  
If sample type is blood, spin sample first and aliquot plasma or serum.
Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

RESULT INTERPRETATION

Additional Information:  
If sample storage instructions are not included, sample will be stored refrigerated at 2-8C.
Specimens are held for 2 weeks only.
HSFZ covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

ADMINISTRATIVE

CPT Codes:  
99001

COMPLETE VIEW

Available Stat:  
No
Test Code:  
HSFZ
Performing Lab:  
Parnassus, Mission Bay and Mt. Zion Central Processing
Collect:
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

Sample Type:
Blood, urine, CSF or other body fluid

Specimen Preparation:
If sample type is blood, spin sample first and aliquot plasma or serum. Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

Additional Information:
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C. Specimens are held for 2 weeks only.

HSFZ covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

CPT Codes:
99001
Hold specimen refrigerated  
HSRF

ORDERING

Available Stat:  
No

Performing Lab:  
Parnassus, Mission Bay and Mt. Zion Central Processing

Additional Information:  
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C.

Specimens are held for 2 weeks only.

HSRF covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

COLLECTION

Sample Type:  
Blood, urine, CSF or other body fluid

Collect:  
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

PROCESSING

Test Code:  
HSRF

Performing Lab:  
Parnassus, Mission Bay and Mt. Zion Central Processing

Specimen Preparation:  
If sample type is blood, spin sample first and aliquot plasma or serum.

Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

RESULT INTERPRETATION

Additional Information:  
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C.

Specimens are held for 2 weeks only.

HSRF covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

ADMINISTRATIVE

CPT Codes:  
99001

COMPLETE VIEW

Available Stat:  
No

Test Code:  
HSRF
Performing Lab:
Parnassus, Mission Bay and Mt. Zion Central Processing

Collect:
CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

Sample Type:
Blood, urine, CSF or other body fluid

Specimen Preparation:
If sample type is blood, spin sample first and aliquot plasma or serum.

Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

Additional Information:
If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C.

Specimens are held for 2 weeks only.

HSRF covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

CPT Codes:
99001
# Hold Specimen Room Temperature

**HDRT**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Parnassus, Mission Bay and Mt. Zion Central Processing

**Additional Information:**
- If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C.
- Specimens are held for 2 weeks only.
- HDRT covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

## COLLECTION

**Sample Type:**
- Blood, urine, CSF or other body fluid

**Collect:**
- CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

## PROCESSING

**Test Code:**
- HDRT

**Performing Lab:**
- Parnassus, Mission Bay and Mt. Zion Central Processing

**Specimen Preparation:**
- If sample type is blood, spin sample first and aliquot plasma or serum.
- Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

## RESULT INTERPRETATION

**Additional Information:**
- If sample storage instructions are not included, sample will be stored refrigerated at 2-8°C.
- Specimens are held for 2 weeks only.
- HDRT covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

## ADMINISTRATIVE

**CPT Codes:**
- 99001

## COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- HDRT

**Performing Lab:**
- Parnassus, Mission Bay and Mt. Zion Central Processing
Parnassus, Mission Bay and Mt. Zion Central Processing

Collect:
- CSF tube, Gold top, Red top, Light Green top, Dark Green top, Lavender top, Blue top, urine container

Sample Type:
- Blood, urine, CSF or other body fluid

Specimen Preparation:
- If sample type is blood, spin sample first and aliquot plasma or serum.
- Please follow instructions included with the order on how to store sample. Order should indicate either frozen, refrigerated or room temperature storage requirement.

Additional Information:
- If sample storage instructions are not included, sample will be stored refrigerated at 2-8C.
- Specimens are held for 2 weeks only.
- HDRT covers cost of materials and preliminary processing, such as centrifugation, aliquotting, storage and record-keeping.

CPT Codes:
- 99001

Test information subject to change.
Homocysteine, Total
HCYS

ORDERING

Performing Lab:
China Basin Chemistry

Performed:
Wednesday and Saturday; for expedited testing, see additional information section below.

Methodology:
Chemiluminescent Microparticle Immunoassay-Abbott Architect i2000

Reported:
1-4 days; for expedited testing, see additional information section below.

Additional Information:
Note: if an inborn error of metabolism is suspected, email Clinlab.chemistry@ucsf.edu with the patient MRN and name to let the lab know that you are sending a sample for same day homocysteine testing. Draw the patient sample and deliver it to the lab. Samples should arrive at the lab by noon on weekdays, or 10am on weekends and holidays for results to be reported by 4pm.

Elevated levels are a risk factor for coronary artery disease and vascular thrombosis. The test for total plasma homocysteine may be used to screen for conditions causing homocystinuria. However, for cystinuria, order quantitative urine cystine.

Homocystinuria due to severe homozygous defects in the cystathionine beta synthase gene (or rare defects in other genes involved in the metabolism of sulfur-containing amino acids) may be associated with plasma homocysteine levels > 100 umol/L. Note that renal disease or deficiency in vitamin B12 or folate may also lead to similar elevations, although the C677T MTHFR mutation does not.

Homocysteine is measured as the sum of free homocysteine, homocysteine released by reduction from disulfides such as homocystine and cysteine-homocysteine, and homocysteine bound to serum proteins. "Total" homocysteine is sometimes signified by the abbreviations tHcy or Hcys or the term "Homocyst(e)ine".

Patients taking methotrexate, nicotinic acid, theophylline, nitrous oxide or L-dopa can have elevated serum or plasma homocysteine levels. S-adenosyl-methionine cross reacts in the Hcy assay (see lab procedure link)


Synonyms:
- Homocysteine, Total

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is recommended because a protein-rich meal may increase results by 15%-20%.

Sample Type:
Heparinized Plasma (serum acceptable)

Collect:
Light Green top on ice (Gold top on ice acceptable)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Remarks:
Chill tube on ice before collection and transport on ice to lab.
If sample is not collected on ice, release of homocysteine from erythrocytes may increase levels by approximately 10% per hour at room temperature. (Clin Chem 50:3-32, 2004)

**PROCESSING**

**Test Code:**

HCYS

**Performing Lab:**

China Basin Chemistry

**Specimen Preparation:**

Centrifuge immediately and refrigerate plasma or serum.

If sample was not received on ice, append the ETC "ICEH" or the following comment: "Specimen not received on ice, may cause falsely elevated result in some cases."

**Preferred Volume:**

1 mL serum or plasma

**Minimum Volume:**

0.5 mL serum or plasma

**RESULT INTERPRETATION**

**Units:**

umol/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Male &amp; Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 days to &lt;1 year</td>
<td>3-10 umol/L</td>
</tr>
<tr>
<td>1-11 years</td>
<td>3-8 umol/L</td>
</tr>
<tr>
<td>12-14 years</td>
<td>5-10 umol/L</td>
</tr>
<tr>
<td>15-18 years</td>
<td>5-13 umol/L</td>
</tr>
<tr>
<td>19-70 years</td>
<td>4-14 umol/L</td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>6-20 umol/L</td>
</tr>
</tbody>
</table>

**Additional Information:**

Note: if an inborn error of metabolism is suspected, email Clinlab.chemistry@ucsf.edu with the patient MRN and name to let the lab know that you are sending a sample for same day homocysteine testing. Draw the patient sample and deliver it to the lab. Samples should arrive at the lab by noon on weekdays, or 10am on weekends and holidays for results to be reported by 4pm.

Elevated levels are a risk factor for coronary artery disease and vascular thrombosis. The test for total plasma homocysteine may be used to screen for conditions causing homocystinuria. However, for cystinuria, order quantitative urine cystine.

Homocystinuria due to severe homozygous defects in the cystathionine beta synthase gene (or rare defects in other genes involved in the metabolism of sulfur-containing amino acids) may be associated with plasma homocysteine levels > 100 umol/L. Note that renal disease or deficiency in vitamin B12 or folate may also lead to similar elevations, although the C677T MTHFR mutation does not.

Homocysteine is measured as the sum of free homocysteine, homocysteine released by reduction from disulfides such as homocystine and cysteine-homocysteine, and homocysteine bound to serum proteins. "Total" homocysteine is sometimes signified by the abbreviations tHcy or Hcys or the term "Homocyst(e)ine".

Patients taking methotrexate, nicotinic acid, theophylline, nitrous oxide or L-dopa can have elevated serum or plasma homocysteine levels. S-adenosyl-methionine cross reacts in the Hcy assay (see lab procedure link)


**ADMINISTRATIVE**

Printed 06/07/19
Test information subject to change
CPT Codes:
83090
LOINC Codes:
13965-9

**COMPLETE VIEW**

**Test Code:**
HCYS

**Performing Lab:**
China Basin Chemistry

**Performed:**
Wednesday and Saturday; for expedited testing, see additional information section below.

**Methodology:**
Chemiluminescent Microparticle Immunoassay-Abbott Architect i2000

**Patient Preparation:**
An 8 hour fast before specimen collection is recommended because a protein-rich meal may increase results by 15%-20%.

**Remarks:**
Chill tube on ice before collection and transport on ice to lab.

If sample is not collected on ice, release of homocysteine from erythrocytes may increase levels by approximately 10% per hour at room temperature. (Clin Chem 50:3-32, 2004)

**Collect:**
Light Green top on ice (Gold top on ice acceptable)

**Amount to Collect:**
2 mL blood

**Sample Type:**
Heparinized Plasma (serum acceptable)

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.5 mL serum or plasma

**Specimen Preparation:**
Centrifuge immediately and refrigerate plasma or serum.

If sample was not received on ice, append the ETC "ICEH" or the following comment: "Specimen not received on ice, may cause falsely elevated result in some cases."

**Units:**
µmol/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Male &amp; Female</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3-10 µmol/L</td>
</tr>
<tr>
<td>1-11 years</td>
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</tr>
<tr>
<td>12-14 years</td>
<td>5-10 µmol/L</td>
</tr>
<tr>
<td>15-18 years</td>
<td>5-13 µmol/L</td>
</tr>
<tr>
<td>19-70 years</td>
<td>4-14 µmol/L</td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>6-20 µmol/L</td>
</tr>
</tbody>
</table>

**Synonyms:**
• Homocysteine, Total

**Reported:**
1-4 days; for expedited testing, see additional information section below.

**Additional Information:**
Note: if an inborn error of metabolism is suspected, email Clinlab.chemistry@ucsf.edu with the patient MRN and name to let the lab know that you are sending a sample for same day homocysteine testing. Draw the patient sample and deliver it to the lab. Samples should arrive at the lab by noon on weekdays, or 10am on weekends and holidays for results to be reported by 4pm.
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Homocysteine is measured as the sum of free homocysteine, homocysteine released by reduction from disulfides such as homocystine and cysteine-homocysteine, and homocysteine bound to serum proteins. “Total” homocysteine is sometimes signified by the abbreviations tHcy or Hcys or the term “Homocyst(e)ine”.

Patients taking methotrexate, nicotinic acid, theophylline, nitrous oxide or L-dopa can have elevated serum or plasma homocysteine levels. S-adenosyl-methionine cross-reacts in the Hcy assay (see lab procedure link).


CPT Codes:
83090

LOINC Codes:
13965-9
Homovanillic Acid, 24 hour urine
HVA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC, ECD
Reported:
Test run Monday-Friday. Turnaround time: 3-6 days.
Additional Information:
To convert mg/d to mmol/d (SI units) multiply by 5.49.
Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.
Synonyms:
• HVA

COLLECTION

Patient Preparation:
Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise and discontinue at least 2 weeks prior to testing any treatment with L-DOPA, which interferes in the assay.
Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
Remarks:
Refrigerate container during collection.
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
HVA
Test Group:
Homovanillic
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate a 10 mL aliquot of the well-mixed collection. The final pH should be < 3. Record the total urine volume on the test request and on the aliquot. Order Quest # 1248N

Printed 06/07/19
Test information subject to change
Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

RESULT INTERPRETATION

Units:
mg/24 h

Reference Interval:
3-8 years  0.5-6.7 mg/d
9-12 years  1.1-6.8 mg/d
13-17 years 1.4-7.2 mg/d
> 17 years  1.6-7.5 mg/d

Additional Information:
To convert mg/d to mmol/d (SI units) multiply by 5.49.

Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

ADMINISTRATIVE

CPT Codes:
83150-90

LOINC Codes:
2436-4

COMPLETE VIEW

Available Stat:
No

Test Code:
HVA

Test Group:
Homovanillic

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC, ECD

Patient Preparation:
Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise and discontinue at least 2 weeks prior to testing any treatment with L-DOPA, which interferes in the assay.

Remarks:
Refrigerate container during collection.

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection
Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

Specimen Preparation:
Refrigerate a 10 mL aliquot of the well-mixed collection. The final pH should be < 3. Record the total urine volume on the test request and on the aliquot. Order Quest # 1248N

Units:
mg/24 h

Reference Interval:
- 3-8 years: 0.5-6.7 mg/d
- 9-12 years: 1.1-6.8 mg/d
- 13-17 years: 1.4-7.2 mg/d
- > 17 years: 1.6-7.5 mg/d

Synonyms:
- HVA

Reported:
Test run Monday-Friday. Turnaround time: 3-6 days.

Additional Information:
To convert mg/d to mmol/d (SI units) multiply by 5.49.

Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

CPT Codes:
83150-90

LOINC Codes:
2436-4
Homovanillic Acid, random urine
HVAR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC, ECD
Reported:
Test run four days a week. Reports in two days.

Additional Information:
Homovanillic acid (HVA, 4-hydroxy-3-methoxyphenylacetic acid) has been identified as the principal urinary metabolite of dopa and dopamine. HVA is excreted in free form in relatively large amounts, and is frequently measured to support a diagnosis of neuroblastoma and malignant pheochromocytoma. HVA has been used to monitor chronic lead exposure and response to medication during the treatment of Parkinson's disease.

Synonyms:
• HVA

COLLECTION

Patient Preparation:
It is preferable for the patient to be off medications for three days prior to collection. However, common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection.

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine

PROCESSING

Test Code:
HVAR
Test Group:
Homovanillic
Sendout:
Yes
Performing Lab:
Quest

Specimen Preparation:
Preferably the sample should be acidified with 6N HCl (or boric acid) to pH < 3. Quest will accept samples from IMMEDIATELY after collection at -20C. Ship frozen. Order Quest Test #84855N.

Samples for Brown & Toland patients MUST be acidified or LabCorp will reject. Order test # 120246

Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Units:
mg/g creatinine

Reference Interval:
Homovanillic acid in random urine:
Birth-6 months  9.1-36 mg/g creatinine
7-11 months  11.2-33 mg/g creatinine
1-2 years  8.5-38 mg/g creatinine
3-8 years  2.1-23 mg/g creatinine
9-12 years  1.1-12 mg/g creatinine
>= 18 year olds  1.4-5.3 mg/g creatinine

Creatinine in random urine:
Birth-6 months  0.02-0.32 g/L
7-11 months  0.02-0.36 g/L
1-2 years  0.02-1.28 g/L
3-8 years  0.2-1.49 g/L
9-12 years  0.02-1.83 g/L
>= 18 year olds  0.27-3.00 g/L

Additional Information:
Homovanillic acid (HVA, 4-hydroxy-3-methoxyphenylacetic acid) has been identified as the principal urinary metabolite of dopa and dopamine. HVA is excreted in free form in relatively large amounts, and is frequently measured to support a diagnosis of neuroblastoma and malignant pheochromocytoma. HVA has been used to monitor chronic lead exposure and response to medication during the treatment of Parkinson's disease.

ADMINISTRATIVE

CPT Codes:
83150-90
LOINC Codes:
11146-8

COMPLETE VIEW

Available Stat:
No
Test Code:
HVAR
Test Group:
Homovanillic
Performing Lab:
Quest
Sendout:
Yes
Methodology:
HPLC, ECD
Patient Preparation:
It is preferable for the patient to be off medications for three days prior to collection. However, common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Patient should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection.
Collect:
Urine cup
Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Preferably the sample should be acidified with 6N HCl (or boric acid) to pH < 3. Quest will accept samples from IMMEDIATELY after collection at -20C. Ship frozen. Order Quest Test #84855N.

Samples for Brown & Toland patients MUST be acidified or LabCorp will reject. Order test # 120246

Units:
mg/g creatinine

Reference Interval:
Homovanillic acid in random urine:
Birth-6 months 9.1-36 mg/g creatinine
7-11 months 11.2-33 mg/g creatinine
1-2 years 8.5-38 mg/g creatinine
3-8 years 2.1-23 mg/g creatinine
9-12 years 1.1-12 mg/g creatinine
>= 18 year olds 1.4-5.3 mg/g creatinine

Creatinine in random urine:
Birth-6 months 0.02-0.32 g/L
7-11 months 0.02-0.36 g/L
1-2 years 0.02-1.28 g/L
3-8 years 0.2-1.49 g/L
9-12 years 0.02-1.83 g/L
>= 18 year olds 0.27-3.00 g/L

Synonyms:
• HVA

Reported:
Test run four days a week. Reports in two days.

Additional Information:
Homovanillic acid (HVA, 4-hydroxy-3-methoxyphenylacetic acid) has been identified as the principal urinary metabolite of dopa and dopamine. HVA is excreted in free form in relatively large amounts, and is frequently measured to support a diagnosis of neuroblastoma and malignant pheochromocytoma. HVA has been used to monitor chronic lead exposure and response to medication during the treatment of Parkinson's disease.

CPT Codes:
83150-90

LOINC Codes:
11146-8
HSV DNA, Qualitative for Non-CSF samples

ORDERING

Performed:
DAILY
Methodology:
Real time PCR detection and thermal melt analysis
Reported:
1 day
Additional Information:
The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.
Synonyms:
• HERPES, HSV

COLLECTION

Sample Type:
Swab from cutaneous or mucocutaneous lesion
Collect:
Flocked swab in universal transport medium (UTM)
Amount to Collect:
1 flocked swab
Preferred Volume:
1 flocked swab
Minimum Volume:
1 flocked swab
Remarks:
Unroof lesion and swab fluid of vesicle and base of lesion to obtain cells. Immediately place swab in UTM. If testing of BAL/bronchial wash, body fluids, or tissue is required, order Herpes Simplex Virus PCR, Quantitative
Stability (from collection to initiation):
Room Temp, Refrigerated 5 days, Frozen 1 month
Rejection Criteria:
Samples not received in suitable container/transport medium. Unsuitable specimen types.

PROCESSING

Preferred Volume:
1 flocked swab
Minimum Volume:
1 flocked swab
Rejection Criteria:
Samples not received in suitable container/transport medium. Unsuitable specimen types.
Stability (from collection to initiation):
Room Temp, Refrigerated 5 days, Frozen 1 month

RESULT INTERPRETATION

Reference Interval:
Not detected
Additional Information:
The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.
## ADMINISTRATIVE

**CPT Codes:**

- 87529

**LOINC Codes:**

- 20444-6

## COMPLETE VIEW

**Performed:**

DAILY

**Methodology:**

Real time PCR detection and thermal melt analysis

**Remarks:**

Unroof lesion and swab fluid of vesicle and base of lesion to obtain cells. Immediately place swab in UTM. If testing of BAL/bronchial wash, body fluids, or tissue is required, order Herpes Simplex Virus PCR, Quantitative

**Collect:**

Flocked swab in universal transport medium (UTM)

**Amount to Collect:**

1 flocked swab

**Sample Type:**

Swab from cutaneous or mucocutaneous lesion

**Preferred Volume:**

1 flocked swab

**Minimum Volume:**

1 flocked swab

**Rejection Criteria:**

Samples not received in suitable container/transport medium. Unsuitable specimen types.

**Reference Interval:**

Not detected

**Synonyms:**

- HERPES, HSV

**Stability (from collection to initiation):**

Room Temp, Refrigerated 5 days, Frozen 1 month

**Reported:**

1 day

**Additional Information:**

The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.

**CPT Codes:**

- 87529

**LOINC Codes:**

- 20444-6
HTLV-I/II Antibody

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: EIA, Western blot confirmation
Reported: 10-14 days (Confirmatory testing requires 10-14 additional days)
Reflex Testing: If the EIA is positive a confirmatory Western blot is automatically performed and charged for separately.
Synonyms:
- Human T Lymphotropic virus antibody
- Human T lymphocytotropic virus antibody

COLLECTION

Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.6 mL serum (insufficient for confirmation)
Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month

PROCESSING

Test Code: HTLV12
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest test #37222
Preferred Volume: 1 mL serum
Minimum Volume: 0.6 mL serum (insufficient for confirmation)
Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month

RESULT INTERPRETATION
Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
86790-90 (Western blot: 86689-90)

COMPLETE VIEW

Available Stat:
No
Test Code:
HTLV12
Performing Lab:
Quest
Sendout:
Yes
Methodology:
EIA, Western blot confirmation
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.6 mL serum (insufficient for confirmation)
Specimen Preparation:
Refrigerate. Order Quest test #37222
Reference Interval:
Negative
Synonyms:
• Human T Lymphotropic virus antibody
• Human T lymphocytotropic virus antibody
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month
Reported:
10-14 days (Confirmatory testing requires 10-14 additional days)
Reflex Testing:
If the EIA is positive a confirmatory Western blot is automatically performed and charged for separately.
CPT Codes:
86790-90 (Western blot: 86689-90)
Human Chorionic Gonadotropin for Pregnancy, serum, < 18 year old (Pediatric)  
HCGPP

ORDERING

Available Stat:  
Yes, for ectopic R/O only

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:  
Parnassus and Mission Bay: 24 hrs per day, 7 days a week  
Mt. Zion: 0700-2300, 7 days a week

Methodology:  
Parnassus and Mission Bay: Beckman Access Chemiluminescent Immunoassay on DxI600 platform.  
Mt. Zion: Access 2 Immunoassay

Reported:  
STAT 1 hour, Routine same or next day.

Additional Information:

Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

Assay Information:

1. This hCG for pregnancy assay does not detect all forms of hCG - a negative hCG for pregnancy result with this assay does not rule out the possibility that increased hCG levels might be present due to unusual forms of hCG produced in some conditions other than pregnancy.

In cases where increases in hCG due to conditions other than pregnancy are suspected, an hCG for tumor assay can be ordered which detects additional forms of hCG not always detected in the hCG for pregnancy assay. While this pregnancy assay may be useful for monitoring some patients with trophoblastic disease producing forms of hCG detected in the pregnancy test, the hCG for tumor assay provides a more sensitive assay for this purpose.

This hCG for pregnancy assay provides good detection of hCG, hyperglycosylated hCG, and hCG beta; marginal detection of nicked hCG, nicked hyperglycosylated hCG, asialo hCG, and nicked hCG beta; poor detection of nicked hCG missing CTP and of beta-core fragment. Note - this assay gives unreliable results on urine samples and should only be used for pregnancy testing in serum (Clinica Chimica Acta 412 (2011) 2216-2222, Clinical Chemistry 56:1839-1844, 2010).

While normal pregnancy is the main cause of increased serum hCG levels, increases in serum hCG may also occur due to false-positive test results caused by immunoassay interferences, neoplastic processes including gestational trophoblastic disease and non-trophoblastic malignancies, and production of hCG by the pituitary gland. Non-trophoblastic tumors where increased hCG may occur include seminiferous and nonseminiferous testicular tumors and benign or malignant non-testicular teratomas. Increased hCG in modest amounts may occasionally occur in hepatic, neuroendocrine, breast, ovarian, pancreatic, cervical, and gastric cancers.

2. The following table describes the cross-reactivity of the Access Total betahCG (5th IS) assay:

<table>
<thead>
<tr>
<th>Substance Concentration added (IU/L)</th>
<th>Substance Concentration without Cross-Reactant (IU/L)</th>
<th>Substance Concentration with Cross-Reactant (IU/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hLH 103</td>
<td>2.25</td>
<td>2.10</td>
</tr>
<tr>
<td>hFSH 1000</td>
<td>2.3</td>
<td>2.23</td>
</tr>
<tr>
<td>hTSH 1</td>
<td>2.44</td>
<td>2.53</td>
</tr>
<tr>
<td>hCG alpha-subunit 500</td>
<td>2.95</td>
<td>2.87</td>
</tr>
</tbody>
</table>


4. Minimum detection limit of 1 IU/L.

5. Total betahCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total betahCG (5th IS) assay. Concentrations of total betahCG measured in 100% of samples were determined to be <= 11.6 IU/L. The observed ranges and 95th percentile of total betahCG concentrations are shown in the table below. (2)
**Reference Population (Non-pregnant Females)**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>Median (IU/L)</th>
<th>Range (IU/L)</th>
<th>95th Percentile [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=18 and &lt;40 years</td>
<td>132</td>
<td>0</td>
<td>0-0.6</td>
<td>0.3 [0.2-0.4]</td>
</tr>
<tr>
<td>&gt;= 40 years</td>
<td>141</td>
<td>0</td>
<td>0-3.1</td>
<td>1.5 [1.1-2.9]</td>
</tr>
<tr>
<td>Post-menopausal*</td>
<td>134</td>
<td>2.8</td>
<td>0.1-11.6</td>
<td>7.7 [6.4-10.4]</td>
</tr>
</tbody>
</table>

*post menopausal status confirmed using circulating FSH and estradiol level. Source: Beckman Coulter Access Total hCG 5th IS package insert.

**Diagnosing pregnancy:**

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and "normal" ranges during different stages of gestation are difficult to define.

Levels in an ectopic pregnancy are often lower than in normal intrauterine pregnancy (3). See Normal Range information for expected levels of hCG in normal pregnancy.

**WARNING: Causes of increased hCG levels other than pregnancy:**

1. Increased hCG levels can also occur in non-pregnant peri-menopausal or post-menopausal women, in patients with gestational trophoblastic disease or other tumors, following previous injection of hCG, and in patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays (3,4).

2. Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels > 20 IU/L (5,6).

3. If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing.

**WARNING: False positives**

1. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor.

2. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

3. In addition to a negative urine hCG test, characteristics of false-positive serum measurements may include low-level positive results (generally < 1000 IU/L and usually < 150 IU/L) that fail to show substantial changes in time with serial testing.

4. A negative serum result obtained by a different testing methodology should also increase suspicion for a false-positive initial test.

Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see HCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.

2. Measure serum hCG levels over several days or weeks and check for a trend in values. False positive results may show little variation over time. In contrast, hCG levels will increase during uncomplicated gestation or decrease after evacuation of trophoblastic tissue.

3. Increased hCG levels due to pituitary hCG in peri-menopausal and post-menopausal women can be suppressed by treatment for 3 weeks with a high-progesterone oral contraceptive pill (6). Elevated levels of FSH > 20 IU/L are also consistent with peri-menopause and post-menopause (5,6).

4. Place an order for a “chemistry special study” (orderable from the Apex test menu) in addition to an order for a regular hCG assay. This will alert the Chemistry section of the laboratory to investigate for possible interferences in the hCG assay. The investigation will include performance of heterophile antibody blocking studies and dilution studies and testing of the sample in several different hCG assays.

**References:**


**Synonyms:**
- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests
- choriogonadotropin
- UCG
- pregnancy test
- ectopic pregnancy test

**COLLECTION**

**Sample Type:**
- Serum or plasma

**Collect:**
- Gold top or Lt Green top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.3 mL serum or plasma

**Remarks:**
- Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 6 months

**PROCESSING**

**Test Code:**
- HCGPP

**Test Group:**
- HCG

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.3 mL serum or plasma

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 6 months
RESULT INTERPRETATION

Units:
IU/L

Reference Interval:
Normal (Non-pregnant) <5 IU/L

Representative hCG ranges during normal pregnancy are summarized below and are based on values previously reported by the assay manufacturer for the method employing the WHO 3rd IS and that have been adjusted to reflect the increased levels in the new method employing the WHO 5th IS.

- 0.2-1 weeks: 5-65 IU/L
- 1-2 weeks: 65-650 IU/L
- 2-3 weeks: 130-6500 IU/L
- 3-4 weeks: 650-13,000 IU/L
- 4-5 weeks: 1300-65,000 IU/L
- 5-6 weeks: 13,000-130,000 IU/L
- 6-8 weeks: 19,500-260,000 IU/L
- 8-12 weeks: 13,000-130,000 IU/L

Additional Information:

Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

Assay Information:

1. This hCG for pregnancy assay does not detect all forms of hCG - a negative hCG for pregnancy result with this assay does not rule out the possibility that increased hCG levels might be present due to unusual forms of hCG produced in some conditions other than pregnancy.

In cases where increases in hCG due to conditions other than pregnancy are suspected, an hCG for tumor assay can be ordered which detects additional forms of hCG not always detected in the hCG for pregnancy assay. While this pregnancy assay may be useful for monitoring some patients with trophoblastic disease producing forms of hCG detected in the pregnancy test, the hCG for tumor assay provides a more sensitive assay for this purpose.

This hCG for pregnancy assay provides good detection of hCG, hyperglycosylated hCG, and hCG beta; marginal detection of nicked hCG, nicked hyperglycosylated hCG, asialo hCG, and nicked hCG beta; poor detection of nicked hCG missing CTP and of beta-core fragment. Note - this assay gives unreliable results on urine samples and should only be used for pregnancy testing in serum (Clinica Chimica Acta 412 (2011) 2216-2222, Clinical Chemistry 56:1839-1844, 2010).

While normal pregnancy is the main cause of increased serum hCG levels, increases in serum hCG may also occur due to false-positive test results caused by immunoassay interferences, neoplastic processes including gestational trophoblastic disease and non-trophoblastic malignancies, and production of hCG by the pituitary gland. Non-trophoblastic tumors where increased hCG may occur include seminiferous and nonseminiferous testicular tumors and benign or malignant non-testicular teratomas. Increased hCG in modest amounts may occasionally occur in hepatic, neuroendocrine, breast, ovarian, pancreatic, cervical, and gastric cancers.

2. The following table describes the cross-reactivity of the Access Total betahCG (5th IS) assay:

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<th>Substance</th>
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<td>hCG alpha-subunit</td>
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4. Minimum detection limit of 1 IU/L.

5. Total betahCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total betahCG (5th IS) assay. Concentrations of total betahCG measured in 100% of samples were determined to be <= 11.6 IU/L. The observed ranges and 95th percentile of total betahCG concentrations are shown in the table below. (2)
Diagnosing pregnancy:

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and "normal" ranges during different stages of gestation are difficult to define.

Levels in an ectopic pregnancy are often lower than in normal intrauterine pregnancy (3). See Normal Range information for expected levels of hCG in normal pregnancy.

WARNING: Causes of increased hCG levels other than pregnancy:

1. Increased hCG levels can also occur in non-pregnant peri-menopausal or post-menopausal women, in patients with gestational trophoblastic disease or other tumors, following previous injection of hCG, and in patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays (3,4).

2. Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels > 20 IU/L (5,6).

3. If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing.

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1. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor.

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4. A negative serum result obtained by a different testing methodology should also increase suspicion for a false-positive initial test.

Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see HCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.

2. Measure serum hCG levels over several days or weeks and check for a trend in values. False positive results may show little variation over time. In contrast, hCG levels will increase during uncomplicated gestation or decrease after evacuation of trophoblastic tissue.

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References:


**ADMINISTRATIVE**

CPT Codes:
- 84702

LOINC Codes:
- 19080-1

**COMPLETE VIEW**

Available Stat:
- Yes, for ectopic R/O only

Test Code:
- HCGPP

Test Group:
- HCG

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
- Parnassus and Mission Bay: 24 hrs per day, 7 days a week
- Mt. Zion: 0700-2300, 7 days a week

Methodology:
- Parnassus and Mission Bay: Beckman Access Chemiluminescent Immunoassay on DxI600 platform.
- Mt. Zion: Access 2 Immunoassay

Remarks:
- Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

Collect:
- Gold top or Lt Green top

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 0.5 mL serum or plasma

Minimum Volume:
- 0.3 mL serum or plasma

Units:
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**Synonyms:**
- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests
- choriogonadotropin
- UCG
- pregnancy test
- ectopic pregnancy test

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 6 months

**Reported:**
- STAT 1 hour, Routine same or next day.

**Additional Information:**

Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

**Assay Information:**

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2. The following table describes the cross-reactivity of the Access Total betaHCG (5th IS) assay:

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<th>Substance</th>
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<td>hCG beta-subunit</td>
<td>500</td>
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4. Minimum detection limit of 1 IU/L.

5. Total beta-hCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total beta-hCG (5th IS) assay. Concentrations of total beta-hCG measured in 100% of samples were determined to be \(\leq 11.6\) IU/L. The observed ranges and 95th percentile of total beta-hCG concentrations are shown in the table below. (2)

<table>
<thead>
<tr>
<th>Reference Population (Non-pregnant Females)</th>
<th>N</th>
<th>Median (IU/L)</th>
<th>Range (IU/L)</th>
<th>95th Percentile [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=18 and &lt;40 years</td>
<td>132</td>
<td>0</td>
<td>0-0.6</td>
<td>0.3 [0.2-0.4]</td>
</tr>
<tr>
<td>&gt;= 40 years</td>
<td>141</td>
<td>0</td>
<td>0-3.1</td>
<td>1.5 [1.1-2.9]</td>
</tr>
<tr>
<td>Post-menopausal*</td>
<td>134</td>
<td>2.8</td>
<td>0.1-11.6</td>
<td>7.7 [6.4-10.4]</td>
</tr>
</tbody>
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*post-menopausal status confirmed using circulating FSH and estradiol level. Source-Beckman Coulter Access Total bHCG 5th IS package insert.

Diagnosing pregnancy:

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and "normal" ranges during different stages of gestation are difficult to define.

Levels in an ectopic pregnancy are often lower than in normal intrauterine pregnancy (3). See Normal Range information for expected levels of hCG in normal pregnancy.

WARNING: Causes of increased hCG levels other than pregnancy:

1. Increased hCG levels can also occur in non-pregnant peri-menopausal or post-menopausal women, in patients with gestational trophoblastic disease or other tumors, following previous injection of hCG, and in patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays (3,4).

2. Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels > 20 IU/L (5,6).

3. If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing.

WARNING: False positives

1. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor.

2. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

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Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see HCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.

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References:


CPT Codes:
84702

LOINC Codes:
19080-1
Human Chorionic Gonadotropin for Pregnancy, serum, >= 18 year old (Adult)
HCGPA

ORDERING

Available Stat:
Yes, for ectopic R/O only

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Parnassus and Mission Bay: 24 hrs per day, 7 days a week
Mt. Zion: 0700-2300, 7 days a week

Methodology:
Parnassus and Mission Bay: Beckman Access Chemiluminescent Immunoassay on DxI600 platform.
Mt. Zion: Access 2 Immunoassay

Reported:
STAT 1 hour, Routine same or next day.

Additional Information:
Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

Assay Information:
1. This hCG for pregnancy assay does not detect all forms of hCG - a negative hCG for pregnancy result with this assay does not rule out the possibility that increased hCG levels might be present due to unusual forms of hCG produced in some conditions other than pregnancy.

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4. Minimum detection limit of 1 IU/L.

5. Total betaCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total betaCG (5th IS) assay. Concentrations of total betaCG measured in 100% of samples were determined to be <= 11.6 IU/L. The observed ranges and 95th percentile of total betaCG concentrations are shown in the table below. (2)
Diagnosing pregnancy:

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and "normal" ranges during different stages of gestation are difficult to define.

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**Synonyms:**
- HCG
- Beta-HCG
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- gonadotropin tests
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- pregnancy test
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**COLLECTION**

**Sample Type:**
- Serum or plasma

**Collect:**
- Gold top or Lt. Green top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Remarks:**
- Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 6 months

**PROCESSING**

**Test Code:**
- HCGPA

**Test Group:**
- HCG

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Chemistry

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 6 months
RESULT INTERPRETATION

Units:
IU/L

Reference Interval:
Normal (Non-pregnant) <5 IU/L

Representative hCG ranges during normal pregnancy are summarized below and are based on values previously reported by the assay manufacturer for the method employing the WHO 3rd IS and that have been adjusted to reflect the increased levels in the new method employing the WHO 5th IS.

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In cases where increases in hCG due to conditions other than pregnancy are suspected, an hCG for tumor assay can be ordered which detects additional forms of hCG not always detected in the hCG for pregnancy assay. While this pregnancy assay may be useful for monitoring some patients with trophoblastic disease producing forms of hCG detected in the pregnancy test, the hCG for tumor assay provides a more sensitive assay for this purpose.

This hCG for pregnancy assay provides good detection of hCG, hyperglycosylated hCG, and hCG beta; marginal detection of nicked hCG, nicked hyperglycosylated hCG, asialo hCG, and nicked hCG beta; poor detection of nicked hCG missing CTP and of beta-core fragment. Note: this assay gives unreliable results on urine samples and should only be used for pregnancy testing in serum (Clinica Chimica Acta 412 (2011) 2216-2222, Clinical Chemistry 56:1839-1844, 2010).

While normal pregnancy is the main cause of increased serum hCG levels, increases in serum hCG may also occur due to false-positive test results caused by immunoassay interferences, neoplastic processes including gestational trophoblastic disease and non-trophoblastic malignancies, and production of hCG by the pituitary gland. Non-trophoblastic tumors where increased hCG may occur include seminiferous and nonseminiferous testicular tumors and benign or malignant non-testicular teratomas. Increased hCG in modest amounts may occasionally occur in hepatic, neuroendocrine, breast, ovarian, pancreatic, cervical, and gastric cancers.

2. The following table describes the cross-reactivity of the Access Total betaCG (5th IS) assay:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration added (IU/L)</th>
<th>Concentration without Cross-Reactant (IU/L)</th>
<th>Concentration with Cross-Reactant (IU/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hLH</td>
<td>103</td>
<td>2.25</td>
<td>2.10</td>
</tr>
<tr>
<td>hFSH</td>
<td>1000</td>
<td>2.3</td>
<td>2.23</td>
</tr>
<tr>
<td>hTSH</td>
<td>1</td>
<td>2.44</td>
<td>2.53</td>
</tr>
<tr>
<td>hCG alpha-subunit</td>
<td>500</td>
<td>2.95</td>
<td>2.87</td>
</tr>
</tbody>
</table>


4. Minimum detection limit of 1 IU/L.

5. Total betaCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total betaCG (5th IS) assay. Concentrations of total betaCG measured in 100% of samples were determined to be <= 11.6 IU/L. The observed ranges and 95th percentile of total betaCG concentrations are shown in the table below. (2)
### Reference Population (Non-pregnant Females)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Median (IU/L)</th>
<th>Range (IU/L)</th>
<th>95th Percentile [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=18 and &lt;40 years</td>
<td>132</td>
<td>0</td>
<td>0-0.6</td>
<td>0.3 [0.2-0.4]</td>
</tr>
<tr>
<td>&gt;= 40 years</td>
<td>141</td>
<td>0</td>
<td>0-3.1</td>
<td>1.5 [1.1-2.9]</td>
</tr>
<tr>
<td>Post-menopausal*</td>
<td>134</td>
<td>2.8</td>
<td>0.1-11.6</td>
<td>7.7 [6.4-10.4]</td>
</tr>
</tbody>
</table>

*post menopausal status confirmed using circulating FSH and estradiol level. Source-Beckman Coulter Access Total bHCG 5th IS package insert.

### Diagnosing pregnancy:

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and "normal" ranges during different stages of gestation are difficult to define.

Levels in an ectopic pregnancy are often lower than in normal intrauterine pregnancy (3). See Normal Range information for expected levels of hCG in normal pregnancy.

**WARNING: Causes of increased hCG levels other than pregnancy:**

1. Increased hCG levels can also occur in non-pregnant peri-menopausal or post-menopausal women, in patients with gestational trophoblastic disease or other tumors, following previous injection of hCG, and in patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays (3,4).

2. Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels > 20 IU/L (5,6).

3. If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing.

**WARNING: False positives**

1. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor.

2. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

3. In addition to a negative urine hCG test, characteristics of false-positive serum measurements may include low-level positive results (generally < 1000 IU/L and usually < 150 IU/L) that fail to show substantial changes in time with serial testing.

4. A negative serum result obtained by a different testing methodology should also increase suspicion for a false-positive initial test.

Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see HCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.

2. Measure serum hCG levels over several days or weeks and check for a trend in values. False positive results may show little variation over time. In contrast, hCG levels will increase during uncomplicated gestation or decrease after evacuation of trophoblastic tissue.

3. Increased hCG levels due to pituitary hCG in peri-menopausal and post-menopausal women can be suppressed by treatment for 3 weeks with a high-progesterone oral contraceptive pill (6). Elevated levels of FSH > 20 IU/L are also consistent with peri-menopause and post-menopause (5,6).

4. Place an order for a "chemistry special study" (orderable from the Apex test menu) in addition to an order for a regular hCG assay. This will alert the Chemistry section of the laboratory to investigate for possible interferences in the hCG assay. The investigation will include performance of heterophile antibody blocking studies and dilution studies and testing of the sample in several different hCG assays.

### References:


**ADMINISTRATIVE**

**CPT Codes:**
84702

**LOINC Codes:**
19080-1

**COMPLETE VIEW**

**Available Stat:**
Yes, for ectopic R/O only

**Test Code:**
HCGPA

**Test Group:**
HCG

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Chemistry

**Performed:**
Parnassus and Mission Bay: 24 hrs per day, 7 days a week
Mt. Zion: 0700-2300, 7 days a week

**Methodology:**
Parnassus and Mission Bay: Beckman Access Chemiluminescent Immunoassay on DxI600 platform.
Mt. Zion: Access 2 Immunoassay

**Remarks:**
Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

**Collect:**
Gold top or Lt. Green top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum or plasma

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.5 mL serum

**Units:**
IU/L

**Reference Interval:**
Normal (Non-pregnant) <5 IU/L

Representative hCG ranges during normal pregnancy are summarized below and are based on values previously reported by the assay manufacturer for the method employing the WHO 3rd IS and that have been adjusted to reflect the increased levels in the new method employing the WHO 5th IS.
0.2-1 weeks 5-65 IU/L
1-2 weeks 65-650 IU/L
2-3 weeks 130-6500 IU/L
3-4 weeks 650-13,000 IU/L
4-5 weeks 1300-65,000 IU/L
5-6 weeks 13,000-130,000 IU/L
6-8 weeks 19,500-260,000 IU/L
8-12 weeks 13,000-130,000 IU/L

Synonyms:
- HCG
- Beta-HCG
- β-HCG
- gonadotropin tests
- choriogonadotropin
- UCG
- pregnancy test
- ectopic pregnancy test

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 6 months

Reported:
- STAT 1 hour, Routine same or next day.

Additional Information:
Be sure that you are selecting the appropriate test for pediatric vs. adult patients. Two tests are offered so that the results can be appropriately filtered to appear in MyChart.

Assay Information:
1. This hCG for pregnancy assay does not detect all forms of hCG - a negative hCG for pregnancy result with this assay does not rule out the possibility that increased hCG levels might be present due to unusual forms of hCG produced in some conditions other than pregnancy.

In cases where increases in hCG due to conditions other than pregnancy are suspected, an hCG for tumor assay can be ordered which detects additional forms of hCG not always detected in the hCG for pregnancy assay. While this pregnancy assay may be useful for monitoring some patients with trophoblastic disease producing forms of hCG detected in the pregnancy test, the hCG for tumor assay provides a more sensitive assay for this purpose.

This hCG for pregnancy assay provides good detection of hCG, hyperglycosylated hCG, and hCG beta; marginal detection of nicked hCG, nicked hyperglycosylated hCG, asialo hCG, and nicked hCG beta; poor detection of nicked hCG missing CTP and of beta-core fragment. Note - this assay gives unreliable results on urine samples and should only be used for pregnancy testing in serum (Clinica Chimica Acta 412 (2011) 2216-2222, Clinical Chemistry 56:1839-1844, 2010).

While normal pregnancy is the main cause of increased serum hCG levels, increases in serum hCG may also occur due to false-positive test results caused by immunoassay interferences, neoplastic processes including gestational trophoblastic disease and non-trophoblastic malignancies, and production of hCG by the pituitary gland. Non-trophoblastic tumors where increased hCG may occur include seminiferous and nonseminiferous testicular tumors and benign or malignant non-testicular teratomas. Increased hCG in modest amounts may occasionally occur in hepatic, neuroendocrine, breast, ovarian, pancreatic, cervical, and gastric cancers.

2. The following table describes the cross-reactivity of the Access Total beta-hCG (5th IS) assay:

<table>
<thead>
<tr>
<th>Substance Concentration added (IU/L)</th>
<th>hCG Concentration without Cross-Reactant (IU/L)</th>
<th>hCG Concentration with Cross-Reactant (IU/L)</th>
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<tr>
<td>hLH</td>
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<tr>
<td>hFSH</td>
<td>1000</td>
<td>2.3</td>
</tr>
<tr>
<td>hTSH</td>
<td>1</td>
<td>2.44</td>
</tr>
<tr>
<td>hCG alpha-subunit</td>
<td>500</td>
<td>2.95</td>
</tr>
</tbody>
</table>

4. Minimum detection limit of 1 IU/L.

5. Total betahCG concentrations were measured in human serum samples collected from apparently healthy non-pregnant females using the Access Total betahCG (5th IS) assay. Concentrations of total betahCG measured in 100% of samples were determined to be <= 11.6 IU/L. The observed ranges and 95th percentile of total betahCG concentrations are shown in the table below. (2)

<table>
<thead>
<tr>
<th>Reference Population (Non-pregnant Females)</th>
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<th>Range (IU/L)</th>
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</tr>
</tbody>
</table>

Post-menopausal status confirmed using circulating FSH and estradiol level. Source: Beckman Coulter Access Total bHCG 5th IS package insert.

Diagnosing pregnancy:

This assay is suitable for pregnancy testing at or slightly before the time of the first missed menstrual period. During the first six weeks of normal pregnancy, serum levels of hCG can be expected to double every 1.5-2.5 days. To confirm pregnancy, it may be helpful to repeat the test after 3-5 days. hCG levels vary widely between individuals, and “normal” ranges during different stages of gestation are difficult to define.

Levels in an ectopic pregnancy are often lower than in normal intrauterine pregnancy (3). See Normal Range information for expected levels of hCG in normal pregnancy.

WARNING: Causes of increased hCG levels other than pregnancy:

1. Increased hCG levels can also occur in non-pregnant peri-menopausal or post-menopausal women, in patients with gestational trophoblastic disease or other tumors, following previous injection of hCG, and in patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays (3,4).

2. Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels > 20 IU/L (5,6).

3. If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing.

WARNING: False positives

1. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor.

2. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

3. In addition to a negative urine hCG test, characteristics of false-positive serum measurements may include low-level positive results (generally < 1000 IU/L and usually < 150 IU/L) that fail to show substantial changes in time with serial testing.

4. A negative serum result obtained by a different testing methodology should also increase suspicion for a false-positive initial test.

Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see HCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.

2. Measure serum hCG levels over several days or weeks and check for a trend in values. False positive results may show little variation over time. In contrast, hCG levels will increase during uncomplicated gestation or decrease after evacuation of trophoblastic tissue.

3. Increased hCG levels due to pituitary hCG in peri-menopausal and post-menopausal women can be suppressed by treatment for 3 weeks with a high-progesterone oral contraceptive pill (6). Elevated levels of FSH > 20 IU/L are also consistent with peri-menopause and post-menopause (5,6).

4. Place an order for a “chemistry special study” (orderable from the Apex test menu) in addition to an order for a regular hCG assay. This will alert the Chemistry section of the laboratory to investigate for possible interferences in the hCG assay. The investigation will include performance of heterophile antibody blocking studies and dilution studies and testing of the sample in several different hCG assays.
References:


CPT Codes:

84702

LOINC Codes:

19080-1
Human Chorionic Gonadotropin for Pregnancy, Urine < 18 year old
HCGUPE

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Performed: Test available 24 hours per day 7 days per week
Methodology: Cardinal Health HCG Combo Rapid Test
Reported: STAT 1 hour, Routine 4 hours
Additional Information:

This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Note, this assay kit is different than that used in POCT.

Synonyms:
- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests Choriogonadotropin
- UCG
- urine pregnancy test
- dipstick pregnancy test

COLLECTION

Sample Type: Random urine (First morning void preferred)
Collect: Urine cup preferred but urine may be collected in any clean, dry, plastic or glass container
Amount to Collect: 10 mL urine
Preferred Volume: 10 mL urine
Minimum Volume: 1 mL urine
Remarks:
Urine specimens may be collected in any clean, dry, plastic or glass container.

Specimens collected at any time may be used, however, the first morning urine generally contains the highest hCG concentration and is the best sample.

**Stability (from collection to initiation):**

Refrigerated 48 hours.

**PROCESSING**

- **Test Code:** HCGUPE
- **Test Group:** HCG
- **Performing Lab:** Parnassus, Mission Bay & Mt. Zion Hematology
- **Preferred Volume:** 10 mL urine
- **Minimum Volume:** 1 mL urine
- **Stability (from collection to initiation):** Refrigerated 48 hours.

**RESULT INTERPRETATION**

- **Reference Interval:** Negative (non-pregnant)
- **Additional Information:**
  - This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.
  
  A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

  If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

  Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

  A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

  Note, this assay kit is different than that used in POCT.

**ADMINISTRATIVE**

- **CPT Codes:**
  - 81025
- **LOINC Codes:**
  - 2106-3

**COMPLETE VIEW**

- Available Stat: Yes
- Test Code:
HCGUPE

Test Group:
HCG

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Cardinal Health HCG Combo Rapid Test

Remarks:
Urine specimens may be collected in any clean, dry, plastic or glass container.
Specimens collected at any time may be used, however, the first morning urine generally contains the highest hCG concentration and is the best sample.

Collect:
Urine cup preferred but urine may be collected in any clean, dry, plastic or glass container

Amount to Collect:
10 mL urine

Sample Type:
Random urine (First morning void preferred)

Preferred Volume:
10 mL urine

Minimum Volume:
1 mL urine

Reference Interval:
Negative (non-pregnant)

Synonyms:
• HCG
• Beta-HCG
• b-HCG
• gonadotropin tests Choriogonadotropin
• UCG
• urine pregnancy test
• dipstick pregnancy test

Stability (from collection to initiation):
Refrigerated 48 hours.

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Note, this assay kit is different than that used in POCT.
CPT Codes:
81025

LOINC Codes:
2106-3
Human Chorionic Gonadotropin for Pregnancy, Urine >= 18 year old
HCGUA

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Performed: Test available 24 hours per day 7 days per week
Methodology: Cardinal Health HCG Combo Rapid Test
Reported: STAT 1 hour, Routine 4 hours
Additional Information:
This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Note, this assay kit is different than that used in POCT.

Synonyms:
- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests Choriogonadotropin
- UCG
- urine pregnancy test
- dipstick pregnancy test

COLLECTION

Sample Type: Random urine (First morning void preferred)
Collect: Urine cup preferred but urine may be collected in any clean, dry, plastic or glass container
Amount to Collect: 10 mL urine
Preferred Volume: 10 mL urine
Minimum Volume: 1 mL urine
Remarks:
Urine specimens may be collected in any clean, dry, plastic or glass container.

Specimens collected at any time may be used, however, the first morning urine generally contains the highest hCG concentration and is the best sample.

Stability (from collection to initiation):
Refrigerated 48 hours.

**PROCESSING**

**Test Code:**
HCGUA

**Test Group:**
HCG

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Preferred Volume:**
10 mL urine

**Minimum Volume:**
1 mL urine

Stability (from collection to initiation):
Refrigerated 48 hours.

**RESULT INTERPRETATION**

**Reference Interval:**
Negative (non-pregnant)

**Additional Information:**
This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Note, this assay kit is different than that used in POCT.

**ADMINISTRATIVE**

**CPT Codes:**
81025

**LOINC Codes:**
2106-3

**COMPLETE VIEW**

Available Stat:
Yes

Test Code:
HCGUA

Test Group:
HCG

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Cardinal Health HCG Combo Rapid Test

Remarks:
Urine specimens may be collected in any clean, dry, plastic or glass container.

Specimens collected at any time may be used, however, the first morning urine generally contains the highest hCG concentration and is the best sample.

Collect:
Urine cup preferred but urine may be collected in any clean, dry, plastic or glass container

Amount to Collect:
10 mL urine

Sample Type:
Random urine (First morning void preferred)

Preferred Volume:
10 mL urine

Minimum Volume:
1 mL urine

Reference Interval:
Negative (non-pregnant)

Synonyms:
- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests Choriogonadotropin
- UCG
- urine pregnancy test
- dipstick pregnancy test

Stability (from collection to initiation):
Refrigerated 48 hours.

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
This is the only test routinely covered by MediCal in the absence of a demonstrated ectopic pregnancy, choriocarcinoma or hydatidiform mole.

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Note, this assay kit is different than that used in POCT.
CPT Codes:
  81025
LOINC Codes:
  2106-3
Human Chorionic Gonadotropin for Tumor, CSF
BHCGC

ORDERING

Available Stat: No
Performing Lab: Mayo
Methodology: ICMA
Reported: Test run Tuesday. Turnaround time: 2-9 days.

Additional Information: This test was developed and its performance characteristics determined by Mayo Medical Laboratories. It has not been approved by the U.S. Food and Drug Administration.

Synonyms:
- HCG
- Beta-HCG
- b-HCG

COLLECTION

Sample Type: CSF
Collect: CSF tube or sterile collection tube
Amount to Collect: See preferred volume
Preferred Volume: 1 mL CSF
Minimum Volume: 0.2 mL CSF
Remarks: Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code: BHCGC
Test Group: HCG
Sendout: Yes
Performing Lab: Mayo
Specimen Preparation: Freeze specimen at -20C. Order MAYO# 8877. Call MCS for pickup
Preferred Volume: 1 mL CSF
Minimum Volume: 0.2 mL CSF
RESULT INTERPRETATION

Units:
   IU/L
Reference Interval:
   <1.5 IU/L
Additional Information:
   This test was developed and its performance characteristics determined by Mayo Medical Laboratories. It has not been approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
   84702-90

COMPLETE VIEW

Available Stat:
   No
Test Code:
   BHCGC
Test Group:
   HCG
Performing Lab:
   Mayo
Sendout:
   Yes
Methodology:
   ICMA
Remarks:
   Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
   CSF tube or sterile collection tube
Amount to Collect:
   See preferred volume
Sample Type:
   CSF
Preferred Volume:
   1 mL CSF
Minimum Volume:
   0.2 mL CSF
Specimen Preparation:
   Freeze specimen at -20C. Order MAYO# 8877. Call MCS for pickup
Units:
   IU/L
Reference Interval:
   <1.5 IU/L
Synonyms:
   • HCG
   • Beta-HCG
   • b-HCG
Reported:
   Test run Tuesday. Turnaround time: 2-9 days.
Additional Information:
   Printed 06/07/19
   Test information subject to change
This test was developed and its performance characteristics determined by Mayo Medical Laboratories. It has not been approved by the U.S. Food and Drug Administration.

**CPT Codes:**

84702-90
Human Chorionic Gonadotropin for Tumor, serum
HCGT

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday, Wednesday and Friday (day shift)
Methodology:
DPC Immunlite 2000 Immunochemiluminometric assay (ICMA)
Reported:
1-3 days
Additional Information:
Assay Information:
1. This test detects all major hCG variants including intact hCG, nicked hCG, free beta hCG subunits, hyperglycosylated hCG, hCG beta core fragments, hCG minus the C-terminal extension, and pituitary hCG (1,2).
2. No cross-reactivity is detected with an LH level of 16.5 ng/ml.
3. The assay is calibrated against the WHO 3rd International Standard 75/537 and has a minimum detection limit of 1 IU/L.
4. According to the assay manufacturer, serum levels of hCG are below 1.1 IU/L in 95% of healthy males and below 2.7 IU/L in 95% of healthy, non-pregnant females (3).

Assay Use:
The use of this test for hCG tumor monitoring was evaluated by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration for use as a tumor marker.

Warning about false positive hCG results and other causes of elevated serum hCG:

Elevated levels of serum hCG can occasionally lead to incorrect diagnoses of gestational trophoblastic disease or non-trophoblastic tumor. Increased hCG levels also occur in pregnant women, non-pregnant peri-menopausal or post-menopausal women, patients recently injected with hCG, patients with heterophile antibodies or other substances that cause false positive elevations in hCG immunoassays, and in infants less than 3 months of age (4,5). Non-pregnant peri-menopausal and post-menopausal women can have hCG levels up to at least 14 IU/L and these women also generally have FSH levels >20 IU/L (6,7).

If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay due to heterophile antibodies or other non-hCG substances and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

In addition to a negative urine hCG test, characteristics of false-positive serum measurements may include low-level positive results (generally <1000 IU/L and usually <150 IU/L) that fail to show substantial changes in time with serial testing. A negative serum result obtained by a different testing methodology should also increase suspicion for a false-positive initial test.

Therefore, when a false-positive serum hCG result is suspected, the following options should be considered:

1. Check of urine hCG (see hCG for Pregnancy, Urine). Urine hCG should be elevated in trophoblastic disease.
2. Measure serum hCG levels over several days or weeks and check for a trend in values. False positive results may show little variation over time. In contrast, hCG levels will increase during uncomplicated gestation or decrease after evacuation of trophoblastic tissue.
3. Increased hCG levels due to pituitary hCG in peri-menopausal and post-menopausal women can be suppressed by treatment for 3 weeks with a high-progesterone oral contraceptive pill (7). Elevated levels of FSH >20 IU/L are also consistent with peri-menopause and
post-menopause (6,7).

4. Place an order for a "chemistry special study" (orderable from the Apex test menu) in addition to an order for a regular hCG assay. This will alert the Chemistry section of the laboratory to investigate for possible interferences in the hCG assay. The investigation will include performance of heterophile antibody blocking studies and dilution studies and testing of the sample in several different hCG assays.

References:

Synonyms:
- HCG
- Beta-HCG
- b-HCG
- molar pregnancy
- tumor marker

**COLLECTION**

**Sample Type:**
Serum or plasma

**Collect:**
Gold top or Light Green top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.25 mL serum or plasma

**PROCESSING**

**Test Code:**
HCGT

**Test Group:**
HCG

**Performing Lab:**
China Basin Chemistry

**Specimen Preparation:**
Freeze specimen at -20C.

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.25 mL serum or plasma
RESULT INTERPRETATION

Units:
IU/L

Reference Interval:
Males: < 3 IU/L
Females: < 6 IU/L

Additional Information:

Assay Information:

1. This test detects all major hCG variants including intact hCG, nicked hCG, free beta hCG subunits, hyperglycosylated hCG, hCG beta core fragments, hCG minus the C-terminal extension, and pituitary hCG (1,2).

2. No cross-reactivity is detected with an LH level of 16.5 ng/ml.

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If gestational trophoblastic disease or non-trophoblastic tumor is suspected, an elevated serum hCG should be confirmed by urine hCG testing. An elevated serum hCG with a negative urine hCG suggests the possibility of a false-positive result in the serum assay due to heterophile antibodies or other non-hCG substances and should not be relied upon for diagnosis of gestational trophoblastic disease or tumor. Increased serum hCG with negative urine hCG can also occur in very early pregnancy or abnormal pregnancy such as ectopic pregnancy, blighted ovum, or miscarriage.

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References:


**ADMINISTRATIVE**

CPT Codes:
- 84702

LDT or Modified FDA:
- Yes

LOINC Codes:
- 53959-3

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- HCGT

Test Group:
- HCG

Performing Lab:
- China Basin Chemistry

Performed:
- Monday, Wednesday and Friday (day shift)

Methodology:
- DPC Immunlite 2000 Immunochemiluminometric assay (ICMA)

Collect:
- Gold top or Light Green top

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 0.5 mL serum or plasma

Minimum Volume:
- 0.25 mL serum or plasma

Specimen Preparation:
- Freeze specimen at -20C.

Units:
- IU/L

Reference Interval:
- Males: < 3 IU/L
- Females: < 6 IU/L

Synonyms:
- HCG
- Beta-HCG
b-HCG
molar pregnancy
tumor marker

Reported:
1-3 days

Additional Information:

Assay Information:

1. This test detects all major hCG variants including intact hCG, nicked hCG, free beta hCG subunits, hyperglycosylated hCG, hCG beta core fragments, hCG minus the C-terminal extension, and pituitary hCG (1,2).

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References:


**CPT Codes:**
- 84702

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 53959-3
Human Herpes virus 7, DNA
HHV7

ORDERING

Available Stat:
No
Performing Lab:
Viracor
Methodology:
Real time PCR
Reported:
Performed Monday-Friday. Turnaround 4-6 days
Additional Information:
Assay range: 100-1.0x10^8 copies/mL
Synonyms:
- HHV7 PCR
- Human Herpes virus 7, PCR
- HHV-7

COLLECTION

Sample Type:
EDTA whole blood, Unfixed tissue, CSF, Marrow, BAL
Collect:
Lavender top, CSF tube or sterile collection tube
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
2 mL blood
Remarks:
Tissue specimens should be placed in sterile saline to keep moist.
Unacceptable Conditions:
Improperly submitted samples

PROCESSING

Test Code:
HHV7
Test Group:
Herpes
Sendout:
Yes
Performing Lab:
Viracor
Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.
Preferred Volume:
3 mL blood
Minimum Volume:
Unacceptable Conditions:
Improperly submitted samples

RESULT INTERPRETATION

Units:
copies/mL

Additional Information:
Assay range: 100-1.0x10^8 copies/mL

ADMINISTRATIVE

CPT Codes:
87799-90

LOINC Codes:
49399-9

COMPLETE VIEW

Available Stat:
No

Test Code:
HHV7

Test Group:
Herpes

Performing Lab:
Viracor

Sendout:
Yes

Methodology:
Real time PCR

Remarks:
Tissue specimens should be placed in sterile saline to keep moist.

Collect:
Lavender top, CSF tube or sterile collection tube

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood, Unfixed tissue, CSF, Marrow, BAL

Preferred Volume:
3 mL blood

Minimum Volume:
2 mL blood

Unacceptable Conditions:
Improperly submitted samples

Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.

Units:
copies/mL

Synonyms:
- HHV7 PCR
- Human Herpes virus 7, PCR
• HHV-7

**Reported:**
Performed Monday-Friday, Turnaround 4-6 days

**Additional Information:**
Assay range: 100-1.0x10^8 copies/mL

**CPT Codes:**
87799-90

**LOINC Codes:**
49399-9
Human Herpes virus 8, DNA

HHV8

ORDERING

Available Stat:
No
Performing Lab: Viracor
Methodology: Real time PCR
Additional Information:
Assay range: 100-1.0x10^8 copies/mL
Synonyms:
- HHV8 PCR
- Human Herpes virus 8, PCR
- HHV-8

COLLECTION

Sample Type:
EDTA whole blood, Unfixed tissue, CSF, BAL
Collect:
Lavender top, CSF tube or sterile collection tube
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
2 mL blood

PROCESSING

Test Code: HHV8
Test Group: Herpes
Sendout: Yes
Performing Lab: Viracor
Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.
Preferred Volume:
3 mL blood
Minimum Volume:
2 mL blood

RESULT INTERPRETATION

Units:
copies/mL

Test information subject to change
Reference Interval:
Not detected

Additional Information:
Assay range: 100-1.0x10^8 copies/mL

CPT Codes:
87799-90

LOINC Codes:
49403-9

Available Stat:
No

Test Code:
HHV8

Test Group:
Herpes

Performing Lab:
Viracor

Sendout:
Yes

Methodology:
Real time PCR

Collect:
Lavender top, CSF tube or sterile collection tube

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood, Unfixed tissue, CSF, BAL

Preferred Volume:
3 mL blood

Minimum Volume:
2 mL blood

Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.

Units:
copies/mL

Reference Interval:
Not detected

Synonyms:
- HHV8 PCR
- Human Herpes virus 8, PCR
- HHV-8

Additional Information:
Assay range: 100-1.0x10^8 copies/mL

CPT Codes:
87799-90

LOINC Codes:
49403-9
Human Herpesvirus 6, DNA
HHV6

ORDERING

Ordering Recommendations:
There is no indication for HHV-6 testing on urine samples.

Available Stat: No

Performing Lab: Viracor

Methodology: Real time PCR

Reported:
Results available 24 hours after receipt at Viracor

Additional Information:
Assay range: 100-1.0x10^8 copies/mL

Synonyms:
- HHV-6 PCR
- Human Herpes virus 6, PCR
- HHV6

COLLECTION

Sample Type:
EDTA whole blood (preferred), CSF, Marrow, BAL, Unfixed tissue

Collect:
Lavender top, CSF tube or sterile collection tube

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
2 mL blood

Remarks:
Place tissue specimens in sterile saline to keep moist

Unacceptable Conditions:
Improperly submitted samples

PROCESSING

Test Code:
HHV6

Test Group:
Herpes

Sendout:
Yes

Performing Lab:
Viracor

Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.

Preferred Volume:
**Sample Type:**
- EDTA whole blood (preferred), CSF, Marrow, BAL, Unfixed tissue

**Preferred Volume:**
- 3 mL blood

**Minimum Volume:**
- 2 mL blood

**Unacceptable Conditions:**
- Improperly submitted samples

**Specimen Preparation:**
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection. CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.

**Synonyms:**
- HHV-6 PCR
- Human Herpes virus 6, PCR
• HHV6

Reported:
Results available 24 hours after receipt at Viracor

Additional Information:
Assay range: 100-1.0x10^8 copies/mL

CPT Codes:
87533-90

LOINC Codes:
29495-9
Human Papilloma Virus High-Risk DNA w/Genotypes 16/18 (aka HPV)

**HPVHRG**

### ORDERING

**Ordering Recommendations:**
- To add on HPVHRG to a sample already sent for Cytology testing, please call Cytology lab (Anatomic Pathology) at 353-7455. DO NOT place order in Apex.
- If only HPVHRG is required without Cytology, please order the HPVHRG in Apex and send the sample to Clinical Labs directly.

**Performing Lab:**
- Immunology

**Performed:**
- Twice a week

**Methodology:**
- PCR

**Reported:**
- 1-5 days

### Additional Information:
According to 2012 guidelines from the American College of Obstetricians and Gynecologists, high-risk HPV testing is appropriate in the following settings:

- Screening in conjunction with cervical cytology for all women aged 30-65 years.
- Initial management of women 25 years or older with ASC-US cytology result.
- Initial management of women 30 years or older with LSIL cytology result.
- Post-colposcopy at 12 months and possibly 24 months depending on cytology and histology results.
- Repeat testing is indicated in patients with prior positive results after 12 months.
- Repeat testing is indicated in patients with prior negative results after 3 years or 5 years depending on cytology results.
- Testing may also be indicated outside of the above guidelines when clinical management may be affected.

**Synonyms:**
- HPV
- Cervical cancer
- Pap smear
- Papanicolaou smear

### COLLECTION

**Sample Type:**
- Cervical brush sample in preservative

**Collect:**
- ThinPrep PreservCyt solution

**Minimum Volume:**
- Sample in 4 mL preservative

**Remarks:**
- Place the cervical brush in the Cytyc ThinPrep PreservCyt solution

**Unacceptable Conditions:**
- Specimen not received in required preservative

### PROCESSING

**Test Code:**
- HPVHRG

**Performing Lab:**
- Immunology

**Specimen Preparation:**
Store at room temperature until processed. Do not centrifuge the sample. Forward to Immunology at room temperature.

To add on HPVHRG to a sample already sent for Cytology testing, provider will need to call Cytology lab (Anatomic Pathology) at 353-7455. DO NOT place order in Apex.

If only HPVHRG is required without Cytology, provider can order the HPVHRG in Apex and send the sample to Clinical Labs directly.

Minimum Volume:
Sample in 4 mL preservative

Unacceptable Conditions:
Specimen not received in required preservative

RESULT INTERPRETATION

Reference Interval:
- HPV DNA, Genotype 16: Not Detected
- HPV DNA, Genotype 18: Not Detected
- HPV DNA, High Risk(Non 16/18): Not Detected

Additional Information:
According to 2012 guidelines from the American College of Obstetricians and Gynecologists, high-risk HPV testing is appropriate in the following settings:

- Screening in conjunction with cervical cytology for all women aged 30-65 years.
- Initial management of women 25 years or older with ASC-US cytology result.
- Initial management of women 30 years or older with LSIL cytology result.
- Post-colposcopy at 12 months and possibly 24 months depending on cytology and histology results.
- Repeat testing is indicated in patients with prior positive results after 12 months.
- Repeat testing is indicated in patients with prior negative results after 3 years or 5 years depending on cytology results.
- Testing may also be indicated outside of the above guidelines when clinical management may be affected.

ADMINISTRATIVE

CPT Codes:
87624

COMPLETE VIEW

Ordering Recommendations:
To add on HPVHRG to a sample already sent for Cytology testing, please call Cytology lab (Anatomic Pathology) at 353-7455. DO NOT place order in Apex.

If only HPVHRG is required without Cytology, please order the HPVHRG in Apex and send the sample to Clinical Labs directly.

Test Code:
HPVHRG

Performing Lab:
Immunology

Performed:
Twice a week

Methodology:
PCR

Remarks:
Place the cervical brush in the Cytyc ThinPrep PreservCyt solution

Collect:
ThinPrep PreservCyt solution

Sample Type:
Cervical brush sample in preservative

Minimum Volume:
Sample in 4 mL preservative
Unacceptable Conditions:
Specimen not received in required preservative

Specimen Preparation:
Store at room temperature until processed. Do not centrifuge the sample. Forward to Immunology at room temperature.

To add on HPVHRG to a sample already sent for Cytology testing, provider will need to call Cytology lab (Anatomic Pathology) at 353-7455. DO NOT place order in Apex.

If only HPVHRG is required without Cytology, provider can order the HPVHRG in Apex and send the sample to Clinical Labs directly.

Reference Interval:
HPV DNA, Genotype 16: Not Detected
HPV DNA, Genotype 18: Not Detected
HPV DNA, High Risk(Non 16/18): Not Detected

Synonyms:
- HPV
- Cervical cancer
- Pap smear
- Papanicolaou smear

Reported:
1-5 days

Additional Information:
According to 2012 guidelines from the American College of Obstetricians and Gynecologists, high-risk HPV testing is appropriate in the following settings:

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- Repeat testing is indicated in patients with prior positive results after 12 months.
- Repeat testing is indicated in patients with prior negative results after 3 years or 5 years depending on cytology results.
- Testing may also be indicated outside of the above guidelines when clinical management may be affected.

CPT Codes:
87624
Huntington's Disease Triplet Repeat
HUNT

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run once per 1-2 weeks or as needed
Methodology:
PCR and capillary electrophoresis. Reflex to genomic Southern blot, if homozygosity is detected by PCR.
Reported:
10-14 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
The results for this test will not be available in APEX to safeguard patient confidentiality. All Huntington's results are referred to Genetic Counselor Jamie C. Fong and must be obtained from her at (415) 476-8613.

Results are reported as in the Table below following recommendations from the American College of Medical Genetics and Genomics (Bean L, Bayrak-Toydemir P. Genet. Med 16:1-7, 2014, PMID: 25356969).

<table>
<thead>
<tr>
<th>CAG repeat size</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 27</td>
<td>Normal allele</td>
</tr>
<tr>
<td>27 - 35</td>
<td>Normal mutable allele</td>
</tr>
<tr>
<td>36 - 39</td>
<td>HD allele with reduced penetrance</td>
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This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Huntington chorea
- HTT

COLLECTION

Sample Type:
EDTA, citrated or ACD whole blood
Collect:
Lavender top preferred, Blue top and Yellow (ACD) tops acceptable
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Remarks:
All patients must receive genetic counseling prior to pre-symptomatic Huntington's testing. The name of the genetic counselor who provided counseling must be included on the test requisition.
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.
PROCESSING

Test Code: HUNT
Performing Lab: Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
3 mL blood

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

RESULT INTERPRETATION

Reference Interval:
Normal, CAG repeat sizes less than 27.

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The results for this test will not be available in APEX to safeguard patient confidentiality. All Huntington's results are referred to Genetic Counselor Jamie C. Fong and must be obtained from her at (415) 476-8613.

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ADMINISTRATIVE

CPT Codes:
81401

LDT or Modified FDA:
Yes

LOINC Codes:
53782-9

COMPLETE VIEW

Available Stat:
No

Test Code: HUNT
Performing Lab: Medical Genomics - Molecular Diagnostics

Performed:
Run once per 1-2 weeks or as needed

Methodology:
PCR and capillary electrophoresis. Reflex to genomic Southern blot, if homozygosity is detected by PCR.
Remarks:
All patients must receive genetic counseling prior to pre-symptomatic Huntingtons testing. The name of the genetic counselor who provided counseling must be included on the test requisition.

If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top preferred, Blue top and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood

Sample Type:
EDTA, citrated or ACD whole blood

Preferred Volume:
3 mL blood

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval:
Normal, CAG repeat sizes less than 27.

Synonyms:
- Huntington chorea
- HTT

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

The results for this test will not be available in APEX to safeguard patient confidentiality. All Huntington's results are referred to Genetic Counselor Jamie C. Fong and must be obtained from her at (415) 476-8613.

Results are reported as in the Table below following recommendations from the American College of Medical Genetics and Genomics (Bean L, Bayrak-Toydemir P. Genet. Med 16:1-7, 2014, PMID: 25356969).

<table>
<thead>
<tr>
<th>CAG repeat size</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 27</td>
<td>Normal allele</td>
</tr>
<tr>
<td>27 - 35</td>
<td>Normal mutable allele</td>
</tr>
<tr>
<td>36 - 39</td>
<td>HD allele with reduced penetrance</td>
</tr>
<tr>
<td>&gt;39</td>
<td>HD allele with full penetrance</td>
</tr>
</tbody>
</table>

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
81401

LDT or Modified FDA:
Yes

LOINC Codes:
53782-9
Hydroxycorticosteroids, 17-
17HS

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Modified Porter-Silber reaction
Reported:
Performed 5x per week. Turnaround 4-6 days
Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 2.76 (based on MW of Cortisol). Test includes creatinine as index of completeness of
collection (see Creatinine).
Synonyms:
• 17-OHCS
• Porter-Silber chromogens

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
50 mL urine
Minimum Volume:
20 mL urine
Remarks:
Obtain container at Specimen Receiving. Refrigerate sample while collecting.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
17HS
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Record total urine volume on test request and on vial containing aliquot. Order Quest # 15202X. For B&T patients order LabCorp test #
004242.
Preferred Volume:
50 mL urine
Minimum Volume:
20 mL urine
Unacceptable Conditions:
  Container not refrigerated during collection.

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 1 week, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
  mg/24 h

Reference Interval:
  Reference ranges not established for infants < 1 year old.
  Male & Female Normal Range
  1-2 years  0.5 - 2.5 mg/24 hr
  3-4 years  1.0 - 4.0 mg/24 hr
  5-6 years  1.0 - 4.8 mg/24 hr
  7-8 years  1.0 - 5.6 mg/24 hr
  9-10 years 1.0 - 7.0 mg/24 hr
  11-12 years 1.5 - 8.0 mg/24 hr

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-16 years</td>
<td>2.0 - 6.0 mg/24 hr</td>
<td>2.8 - 6.8 mg/24 hr</td>
</tr>
<tr>
<td>17-20 years</td>
<td>3.0 - 10.0 mg/24 hr</td>
<td>2.0 - 7.0 mg/24 hr</td>
</tr>
<tr>
<td>&gt; 20 years</td>
<td>3.0 - 10.0 mg/24 hr</td>
<td>2.0 - 6.0 mg/24 hr</td>
</tr>
</tbody>
</table>

Additional Information:
  To convert mg/d to µmol/d (SI units) multiply by 2.76 (based on MW of Cortisol). Test includes creatinine as index of completeness of collection (see Creatinine).

ADMINISTRATIVE

CPT Codes:
  82570-90, 83491-90

LOINC Codes:
  21036-9

COMPLETE VIEW

Available Stat:
  No

Test Code:
  17HS

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Modified Porter-Silber reaction

Remarks:
  Obtain container at Specimen Receiving. Refrigerate sample while collecting.

Collect:
  24 hour urine collection container

Amount to Collect:
  Entire 24 hour urine output

Sample Type:
  24 hour urine collection

Preferred Volume:
  50 mL urine
Minimum Volume:
20 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

Specimen Preparation:
Record total urine volume on test request and on vial containing aliquot. Order Quest # 15202X. For B&T patients order LabCorp test # 004242.

Units:
mg/24 h

Reference Interval:
Reference ranges not established for infants < 1 year old.

<table>
<thead>
<tr>
<th>Age</th>
<th>Male Normal Range</th>
<th>Female Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 years</td>
<td>0.5 - 2.5 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td>3-4 years</td>
<td>1.0 - 4.0 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td>5-6 years</td>
<td>1.0 - 4.8 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td>7-8 years</td>
<td>1.0 - 5.6 mg/24 hr</td>
<td></td>
</tr>
<tr>
<td>9-10 years</td>
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<tr>
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</tr>
<tr>
<td>&gt; 20 years</td>
<td>3.0 - 10.0 mg/24 hr</td>
<td>2.0 - 6.0 mg/24 hr</td>
</tr>
</tbody>
</table>

Synonyms:
- 17-OHCS
- Porter-Silber chromogens

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen at -20°C 1 month

Reported:
Performed 5x per week. Turnaround 4-6 days

Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 2.76 (based on MW of Cortisol). Test includes creatinine as index of completeness of collection (see Creatinine).

CPT Codes:
82570-90, 83491-90

LOINC Codes:
21036-9
Hydroxypregnenolone, 17-HPRE

ORDERING

Available Stat:  
No  
Performing Lab:  
ESCI  
Reported:  
Test run Wednesday and Saturday. Turnaround time: 3-6 days.  
Additional Information:  
To convert ng/dL to nmol/L (SI units) multiply by 0.0301.

COLLECTION

Sample Type:  
Serum  
Collect:  
Gold top  
Amount to Collect:  
2 mL blood  
Preferred Volume:  
1 mL serum  
Minimum Volume:  
0.2 mL serum

PROCESSING

Test Code:  
HPRE  
Sendout:  
Yes  
Performing Lab:  
ESCI  
Specimen Preparation:  
Process immediately. Freeze serum at -20C  
Preferred Volume:  
1 mL serum  
Minimum Volume:  
0.2 mL serum

RESULT INTERPRETATION

Units:  
ng/dL  
Reference Interval:  
<table>
<thead>
<tr>
<th>Segment</th>
<th>Reference Interval (ng/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord blood</td>
<td>50-2121</td>
</tr>
<tr>
<td>Premature infants</td>
<td>64-2380</td>
</tr>
<tr>
<td>Full-term infants-3 days</td>
<td>10-829</td>
</tr>
<tr>
<td>1-6 months</td>
<td>36-763</td>
</tr>
<tr>
<td>6-12 months</td>
<td>42-540</td>
</tr>
<tr>
<td>Pre-pubertal child (1-10 y/o)</td>
<td>15-221</td>
</tr>
<tr>
<td>Pubertal age groups</td>
<td>44 -235</td>
</tr>
</tbody>
</table>
>= 18 year olds        53-357 ng/dL

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0301.

CPT Codes:
  84143-90
LOINC Codes:
  6765-2

COMPLETE VIEW

Available Stat:
No
Test Code:
HPRE
Performing Lab:
ESCI
Sendout:
Yes
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Specimen Preparation:
Process immediately. Freeze serum at -20C
Units:
ng/dL
Reference Interval:
Cord blood   50-2121 ng/dL
Premature infants  64-2380 ng/dL
Full-term infants-3 days  10-829 ng/dL
1-6 months       36-763 ng/dL
6-12 months       42-540 ng/dL
Pre-pubertal child (1-10 y/o)  15-221 ng/dL
Pubertal age groups  44-235 ng/dL
>= 18 year olds    53-357 ng/dL

Reported:
Test run Wednesday and Saturday. Turnaround time: 3-6 days.

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0301.

CPT Codes:
  84143-90
LOINC Codes:
  6765-2
Hydroxyprogesterone, 17-17HP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Test run six days a week. Turnaround 3-6 days
Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0303.

17-Hydroxyprogesterone is elevated in patients with Congenital Adrenal Hyperplasia (CAH). CAH is a group of autosomal recessive diseases characterized by a deficiency of cortisol and an excess of ACTH concentration.

17 Hydroxyprogesterone is also useful in monitoring cortisol replacement therapy and in evaluating infertility and adrenal and ovarian neoplasms.

Synonyms:
• 17-OH-progesterone

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Remarks:
Collect in red top tube only, Gold top is not acceptable

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen at -20C 2 years.

Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
17HP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Order Quest # 17180.
Preferred Volume:
1 mL serum
Minimum Volume: 0.3 mL serum

Unacceptable Conditions: Collected in Gold top

Stability (from collection to initiation): Room temperature 2 days, refrigerated 1 week, frozen at -20°C 2 years.

RESULT INTERPRETATION

Units: ng/dL

Reference Interval:

Premature Infants (31 - 35 weeks) <= 360 ng/dL
Term Infants (3 days) <= 420 ng/dL

Pediatric:
1 - 12 months 11 - 170 ng/dL
1 - 4 years 4 - 115 ng/dL
5 - 9 years <= 90 ng/dL
10 - 13 years <= 169 ng/dL
14 - 17 years 16 - 283 ng/dL

Pregnancy:
First Trimester 78 - 457 ng/dL
Second Trimester 90 - 357 ng/dL
Third Trimester 44 - 578 ng/dL

>= 18 year old males:
8-30 years 32-307 ng/dL
31-40 years 42-196 ng/dL
41-50 years 33-195 ng/dL
51-60 years 37-129 ng/dL

>= 18 year old females:
Follicular phase <= 185 ng/dL
Mid-cycle phase <= 225 ng/dL
Luteal phase <= 285 ng/dL
Postmenopausal <= 45 ng/dL

Additional Information:
To convert ng/dL to nmol/L (SI units) multiply by 0.0303.

17-Hydroxyprogesterone is elevated in patients with Congenital Adrenal Hyperplasia (CAH). CAH is a group of autosomal recessive diseases characterized by a deficiency of cortisol and an excess of ACTH concentration.

17 Hydroxyprogesterone is also useful in monitoring cortisol replacement therapy and in evaluating infertility and adrenal and ovarian neoplasms.

ADMINISTRATIVE

CPT Codes:
83498-90

LOINC Codes:
1668-3
Available Stat: No
Test Code: 17HP
Performing Lab: Quest
Sendout: Yes
Methodology: LC/MS/MS
Remarks: Collect in red top tube only, Gold top is not acceptable
Collect: Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Collected in Gold top
Specimen Preparation: Order Quest # 17180.
Units: ng/dL
Reference Interval:
- Premature Infants (31 - 35 weeks) <= 360 ng/dL
- Term Infants (3 days) <= 420 ng/dL

Pediatric:
- 1 - 12 months 11 - 170 ng/dL
- 1 - 4 years 4 - 115 ng/dL
- 5 - 9 years <= 90 ng/dL
- 10 - 13 years <= 169 ng/dL
- 14 - 17 years 16 - 283 ng/dL

Pregnancy:
- First Trimester 78 - 457 ng/dL
- Second Trimester 90 - 357 ng/dL
- Third Trimester 44 - 578 ng/dL

>= 18 year old males:
- 8-30 years 32-307 ng/dL
- 31-40 years 42-196 ng/dL
- 41-50 years 33-195 ng/dL
- 51-60 years 37-129 ng/dL

>= 18 year old females:
- Follicular phase <= 185 ng/dL
- Mid-cycle phase <= 225 ng/dL
- Luteal phase <= 285 ng/dL
- Postmenopausal <= 45 ng/dL
Synonyms:
  - 17-OH-progesterone

Stability (from collection to initiation):
  Room temperature 2 days, refrigerated 1 week, frozen at -20°C 2 years.

Reported:
  Test run six days a week. Turnaround 3-6 days

Additional Information:
  To convert ng/dL to nmol/L (SI units) multiply by 0.0303.

  17-Hydroxyprogesterone is elevated in patients with Congenital Adrenal Hyperplasia (CAH). CAH is a group of autosomal recessive
diseases characterized by a deficiency of cortisol and an excess of ACTH concentration.

  17 Hydroxyprogesterone is also useful in monitoring cortisol replacement therapy and in evaluating infertility and adrenal and ovarian
neoplasms.

CPT Codes:
  83498-90

LOINC Codes:
  1668-3
Hypersensitivity Pneumonitis Panel
HPTA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunodiffusion
Reported:
Test performed Tuesday-Friday. Turnaround time: 2-6 days.
Additional Information:
Immunodiffusion panel detects primarily IgG antibodies to the antigens of Micropolyspora faeni, Thermoactinomyces vulgaris, T. candidus, Aspergillus fumigatus Saccharomonas viridis and avian (pigeon) serum.
Synonyms:
- Thermophilic actinomycetes
- Aspergillus fumigatus, Micropolyspora faeni, Pigeon serum, T. candidis, T. vulgaris, S. viridis
- farmers lung serology

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.5 mL serum

PROCESSING

Test Code:
HPTA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 14978X.
Preferred Volume:
2 mL serum
Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
Immunodiffusion panel detects primarily IgG antibodies to the antigens of Micropolyspora faeni, Thermoactinomyces vulgaris, T. candidus, Aspergillus fumigatus Saccharomonas viridis and avian (pigeon) serum.

ADMINISTRATIVE

CPT Codes:
- 86331-90, 86606-90, 86609-90 x 4

LOINC Codes:
- 35577-6

COMPLETE VIEW

Available Stat:
- No

Test Code:
- HPTA

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Immunodiffusion

Collect:
- Gold top

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum

Preferred Volume:
- 2 mL serum

Minimum Volume:
- 0.5 mL serum

Specimen Preparation:
- Refrigerate. Order Quest # 14978X.

Reference Interval:
- Negative

Synonyms:
- Thermophilic actinomycetes
- Aspergillus fumigatus, Micropolyspora faeni, Pigeon serum, T. candidis, T. vulgaris, S. viridis
- Farmers lung serology

Reported:
- Test performed Tuesday-Friday. Turnaround time: 2-6 days.

Additional Information:
Immunodiffusion panel detects primarily IgG antibodies to the antigens of Micropolyspora faeni, Thermoactinomyces vulgaris, T. candidus, Aspergillus fumigatus Saccharomonas viridis and avian (pigeon) serum.

CPT Codes:
- 86331-90, 86606-90, 86609-90 x 4

LOINC Codes:
- 35577-6
Hypoglycemia Panel, Sulfonylureas Qualitative, Serum or Plasma

ORDERING

Ordering Recommendations:
Preferred test for evaluating if etiology of hypoglycemia is sulfonylurea ingestion.

Performing Lab:
ARUP

Performed:
Sun, Tue, Thu

Methodology:
Qualitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-6 days

Synonyms:
- Amaryl (Glimepiride)
- Diabinese (Chlorpropamide)
- Diabinese[R] (Sulfonylurea Hypoglycemics Panel (Qualitative), Serum or Plasma)
- Dymelor (Acetohexamide)
- Glucotrol (Glipizide)
- Meglitinides
- Micronase (Glyburide)
- Orinase (Tolbutamide)
- Prandin (Regaglinide)
- Starlix (Nateglinide)
- Tolinase (Tolazamide)

COLLECTION

Sample Type:
Serum of plasma

Collect:
Plain red, gray (NaF/K Oxalate), green (Na Heparin), lavender (EDTA), or pink (K₂EDTA).

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.4 mL serum or plasma

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 11 days; Frozen: 3 months

Storage/Transport Temperature:
Frozen. Also acceptable: Refrigerated.

Unacceptable Conditions:
Separator tubes.

PROCESSING

Test Code:
SULFO
ARUP Test Code:
2010292
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.4 mL)
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.4 mL serum or plasma
Unacceptable Conditions:
Separator tubes.
Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 11 days; Frozen: 3 months
Storage/Transport Temperature:
Frozen. Also acceptable: Refrigerated.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Cutoff Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyburide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Glimepiride</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Glipizide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Repaglinide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Nateglinide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Acetohexamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Chlorpropamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Tolazamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Tolbutamide</td>
<td>100 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
This assay is used to evaluate hypoglycemia that may be caused from the ingestion of sulfonylurea drugs. Hypoglycemic drugs are detected (present) in this assay if the drug concentration is greater than the limit of detection (cut-off). The presence of hypoglycemic drug(s) indicates a recent ingestion.

ADMINISTRATIVE

CPT Codes:
80377 (Alt code: G0480)
LOINC:
- 21567-3
- 21566-5
- 48328-9
- 49487-2
- 48327-1
- 48326-3
- 48325-5
- 48329-7
Ordering Recommendations:

- Preferred test for evaluating if etiology of hypoglycemia is sulfonylurea ingestion.

Test Code:

- SULFO

ARUP Test Code:

- 2010292

Performing Lab:

- ARUP

Sendout:

- Yes

Performed:

- Sun, Tue, Thu

Methodology:

- Qualitative Liquid Chromatography-Tandem Mass Spectrometry

Collect:

- Plain red, gray (NaF/K Oxalate), green (Na Heparin), lavender (EDTA), or pink (K₂EDTA).

Amount to Collect:

- 2 mL blood

Sample Type:

- Serum of plasma

Preferred Volume:

- 1 mL serum or plasma

Minimum Volume:

- 0.4 mL serum or plasma

Unacceptable Conditions:

- Separator tubes.

Specimen Preparation:

- Separate from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.4 mL)

Reference Interval:

<table>
<thead>
<tr>
<th>Drug</th>
<th>Cutoff Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glyburide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Glimepiride</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Glipizide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Repaglinide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Nateglinide</td>
<td>5 ng/mL</td>
</tr>
<tr>
<td>Acetohexamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Chlorpropamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Tolazamide</td>
<td>100 ng/mL</td>
</tr>
<tr>
<td>Tolbutamide</td>
<td>100 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:

This assay is used to evaluate hypoglycemia that may be caused from the ingestion of sulfonylurea drugs. Hypoglycemic drugs are detected (present) in this assay if the drug concentration is greater than the limit of detection (cut-off). The presence of hypoglycemic drug(s) indicates a recent ingestion.

Synonyms:

- Amaryl (Glimepiride)
- Diabinese (Chlorpropamide)
- Diabinese(R) (Sulfonylurea Hypoglycemics Panel (Qualitative), Serum or Plasma)
- Dymelor (Acetohexamide)
- Glucotrol (Glipizide)
- Meglitinides
- Micronase (Glyburide)
- Orinase (Tolbutamide)
- Prandin (Regaglinide)
- Starlix (Nateglinide)
- Tolinase (Tolazamide)

**Storage/Transport Temperature:**
- Frozen. Also acceptable: Refrigerated.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 11 days; Frozen: 3 months

**Reported:**
- 1-6 days

**CPT Codes:**
- 80377 (Alt code: G0480)

**LOINC:**
- 21567-3
- 21566-5
- 48328-9
- 49487-2
- 48327-1
- 48326-3
- 48325-5
- 48329-7
- 43626-1

Test information subject to change
Ibuprofen

ORDERING

Available Stat:  
No
Performing Lab:  
MDTX via Quest
Methodology:  
HPLC
Reported:  
Test performed daily. Turnaround time: 3-5 days.
Additional Information:  
For patients with Cystic Fibrosis.
Synonyms:  
• Advil

COLLECTION

Sample Type:  
Serum (plasma acceptable)
Collect:  
Red top (Lavender or Dark Green top OK; Gold top NOT acceptable)
Amount to Collect:  
4 mL blood
Preferred Volume:  
2 ml serum or plasma
Minimum Volume:  
1 mL serum or plasma
Unacceptable Conditions:  
Collected in Gold top

PROCESSING

Test Code:  
IBUP
Sendout:  
Yes
Performing Lab:  
MDTX via Quest
Specimen Preparation:  
Refrigerate. Order Quest # 5136
Preferred Volume:  
2 ml serum or plasma
Minimum Volume:  
1 mL serum or plasma
Unacceptable Conditions:  
Collected in Gold top

RESULT INTERPRETATION

Units:
Reference Interval:
- Normal: 0-49 mg/L
- Potentially toxic: 50-74 mg/L
- Toxic: > 75 mg/L

Critical Values:
- Quest Priority-1: >= 100 mg/L

Additional Information:
- For patients with Cystic Fibrosis.

CPT Codes:
- 80299-90

LOINC Codes:
- 35614-7

Available Stat:
- No

Test Code:
- IBUP

Performing Lab:
- MDTX via Quest

Sendout:
- Yes

Methodology:
- HPLC

Collect:
- Red top (Lavender or Dark Green top OK; Gold top NOT acceptable)

Amount to Collect:
- 4 mL blood

Sample Type:
- Serum (plasma acceptable)

Preferred Volume:
- 2 ml serum or plasma

Minimum Volume:
- 1 mL serum or plasma

Unacceptable Conditions:
- Collected in Gold top

Specimen Preparation:
- Refrigerate. Order Quest # 5136

Units:
- mg/L

Reference Interval:
- Normal: 0-49 mg/L
- Potentially toxic: 50-74 mg/L
- Toxic: > 75 mg/L

Critical Values:
- Quest Priority-1: >= 100 mg/L

Synonyms:
- Advil

Reported:
- Test performed daily. Turnaround time: 3-5 days.
Additional Information:
For patients with Cystic Fibrosis.

CPT Codes:
80299-90

LOINC Codes:
35614-7
Ig Heavy-Chain Gene Rearrangement
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
PCR
Reported:
Test set up Monday and Wednesday. Turnaround time: 8-10 days.
Additional Information:
Primarily used to confirm clonality in suspected B-cell lymphoma. Note clonal rearrangements of the Ig heavy chain gene is strongly supportive of a B-cell lineage but may be seen in rare T-cell lymphoma. This test was developed and its performance characteristics determined by Quest Diagnostics-Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.
Synonyms:
• PCR

COLLECTION

Sample Type:
EDTA whole blood, Marrow, fresh frozen or formalin fixed tissue
Collect:
Lavender top
Amount to Collect:
5 mL blood
Preferred Volume:
5 mL blood
Minimum Volume:
1 mL blood
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do NOT centrifuge blood-keep at room temperature; freeze tissue at -70C. Order Quest # 14868X.
Preferred Volume:
5 mL blood
Minimum Volume:
1 mL blood
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week

RESULT INTERPRETATION
Reference Interval:
Negative

Additional Information:
Primarily used to confirm clonality in suspected B-cell lymphoma. Note clonal rearrangements of the Ig heavy chain gene is strongly supportive of a B-cell lineage but may be seen in rare T-cell lymphoma. This test was developed and its performance characteristics determined by Quest Diagnostics-Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
83890-90, 83898-90 x3, 83909-90 x3, 83912-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
PCR

Collect:
Lavender top

Amount to Collect:
5 mL blood

Sample Type:
EDTA whole blood, Marrow, fresh frozen or formalin fixed tissue

Preferred Volume:
5 mL blood

Minimum Volume:
1 mL blood

Specimen Preparation:
Do NOT centrifuge blood-keep at room temperature; freeze tissue at -70C. Order Quest # 14868X.

Reference Interval:
Negative

Synonyms:
PCR

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week

Reported:
Test set up Monday and Wednesday. Turnaround time: 8-10 days.

Additional Information:
Primarily used to confirm clonality in suspected B-cell lymphoma. Note clonal rearrangements of the Ig heavy chain gene is strongly supportive of a B-cell lineage but may be seen in rare T-cell lymphoma. This test was developed and its performance characteristics determined by Quest Diagnostics-Nichols Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
83890-90, 83898-90 x3, 83909-90 x3, 83912-90
IgA, serum

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Rate Nephelometry
Reported:
1-3 days
Additional Information:
See also Anti-IgA.
Synonyms:
- Alpha chain

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples

PROCESSING

Test Code:
IGA
Performing Lab:
Immunology
Specimen Preparation:
Refrigerate
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples

RESULT INTERPRETATION
Units:
mg/dL

**Reference Interval:**
- Cord blood: 1-4 mg/dL
- 1 month: 1-53 mg/dL
- 2 months: 3-47 mg/dL
- 3 months: 5-46 mg/dL
- 4 months: 4-73 mg/dL
- 5 months: 8-84 mg/dL
- 6 months: 8-68 mg/dL
- 7-9 months: 11-90 mg/dL
- 10-12 months: 16-84 mg/dL
- 1-3 years: 14-159 mg/dL
- 4-5 years: 25-154 mg/dL
- 6-10 years: 33-236 mg/dL
- > 10 years: 89-581 mg/dL

**Additional Information:**

See also Anti-IgA.

**ADMINISTRATIVE**

**CPT Codes:**
82784

**LOINC Codes:**
2458-8

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
IGA

**Performing Lab:**
Immunology

**Performed:**
Monday-Friday (day shift)

**Methodology:**
Rate Nephelometry

**Collect:**
Gold top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.3 mL serum

**Unacceptable Conditions:**
Lipemic samples

**Specimen Preparation:**
Refrigerate

**Units:**
mg/dL
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
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</thead>
<tbody>
<tr>
<td>Cord blood</td>
<td>1-4 mg/dL</td>
</tr>
<tr>
<td>1 month</td>
<td>1-53 mg/dL</td>
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<tr>
<td>2 months</td>
<td>3-47 mg/dL</td>
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<tr>
<td>3 months</td>
<td>5-46 mg/dL</td>
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<tr>
<td>4 months</td>
<td>4-73 mg/dL</td>
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<tr>
<td>5 months</td>
<td>8-84 mg/dL</td>
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<tr>
<td>6 months</td>
<td>8-68 mg/dL</td>
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<tr>
<td>7-9 months</td>
<td>11-90 mg/dL</td>
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<tr>
<td>10-12 months</td>
<td>16-84 mg/dL</td>
</tr>
<tr>
<td>1-3 years</td>
<td>14-159 mg/dL</td>
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<tr>
<td>4-5 years</td>
<td>25-154 mg/dL</td>
</tr>
<tr>
<td>6-10 years</td>
<td>33-236 mg/dL</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>89-581 mg/dL</td>
</tr>
</tbody>
</table>

Synonyms:
- Alpha chain

Reported:
1-3 days

Additional Information:

See also Anti-IgA.

CPT Codes:
- 82784

LOINC Codes:
- 2458-8
IgD, serum

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Nephelometry
Reported: Set of 2x per week, Turnaround time 5-7 days.
Additional Information:
   IgD molecular weight 185 kD is one of the 5 classes of human immunoglobulins. IgD accounts for less than 1% of the total plasma immunoglobulins. Very high serum IgD concentrations are found in the multiple myeloma patients. Raised levels are also found in the hyperimmunoglobulinemia IgD syndrome (HIDS).
Synonyms:
   • Immunoglobulin D

COLLECTION

Sample Type: Serum
Collect:
   Red top, Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 7 days, frozen 3 weeks.

PROCESSING

Test Code: IGD
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
   Freeze serum and send frozen. Order Quest test #541X, if B/T patients, order LabCorp test #002162.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 7 days, frozen 3 weeks.

RESULT INTERPRETATION
Units:
mg/L

Reference Interval:
<179 mg/L

Additional Information:
IgD molecular weight 185 kD is one of the 5 classes of human immunoglobulins. IgD accounts for less than 1% of the total plasma immunoglobulins. Very high serum IgD concentrations are found in the multiple myeloma patients. Raised levels are also found in the hyperimmunoglobulinemia IgD syndrome (HIDS).

CPT Codes:
82784-90

Available Stat:
No

Test Code:
IGD

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Nephelometry

Collect:
Red top, Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze serum and send frozen. Order Quest test #541X, if B/T patients, order LabCorp test #002162.

Units:
mg/L

Reference Interval:
<179 mg/L

Synonyms:

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 7 days, frozen 3 weeks.

Reported:
Set of 2x per week, Turnaround time 5-7 days.

Additional Information:
IgD molecular weight 185 kD is one of the 5 classes of human immunoglobulins. IgD accounts for less than 1% of the total plasma immunoglobulins. Very high serum IgD concentrations are found in the multiple myeloma patients. Raised levels are also found in the hyperimmunoglobulinemia IgD syndrome (HIDS).

CPT Codes:
82784-90
IgE, serum

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Tuesday (day shift)
Methodology:
Rate nephelometry
Reported:
1-8 days
Additional Information:
Young children without allergic symptoms can be expected to have values which are 10-20% of adult levels. Children with high IgE levels have an increased incidence of symptoms consistent with atopic allergy.

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples.

PROCESSING

Test Code:
IGE
Performing Lab:
Immunology
Specimen Preparation:
Freeze at -20C
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples.

RESULT INTERPRETATION

Units:
IU/mL
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>IU/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>0-24 IU/mL</td>
</tr>
<tr>
<td>1-3 years</td>
<td>2-149 IU/mL</td>
</tr>
<tr>
<td>4-10 years</td>
<td>8-279 IU/mL</td>
</tr>
<tr>
<td>11-15 years</td>
<td>5-295 IU/mL</td>
</tr>
<tr>
<td>&gt;=16 years</td>
<td>&lt;165 IU/mL</td>
</tr>
</tbody>
</table>

Note:
Pediatric reference ranges have not been validated by the UCSF Clinical Laboratories.


Additional Information:
Young children without allergic symptoms can be expected to have values which are 10-20% of adult levels. Children with high IgE levels have an increased incidence of symptoms consistent with atopic allergy.

ADMINISTRATIVE

CPT Codes:
82785

LOINC Codes:
19113-0

COMPLETE VIEW

Available Stat: No
Test Code: IGE
Performing Lab: Immunology
Performed: Tuesday (day shift)
Methodology: Rate nephelometry
Collect: Gold top
Amount to Collect: 1 mL blood
Sample Type: Serum
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Lipemic samples.
Specimen Preparation: Freeze at -20C
Units: IU/mL
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>IU/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>0-24 IU/mL</td>
</tr>
</tbody>
</table>

Test information subject to change
1-3 years  2-149 IU/mL
4-10 years  8-279 IU/mL
11-15 years  5-295 IU/mL
>=16 years  <165 IU/mL

Note:
Pediatric reference ranges have not been validated by the UCSF Clinical Laboratories.


Reported:
1-8 days

Additional Information:
Young children without allergic symptoms can be expected to have values which are 10-20% of adult levels. Children with high IgE levels have an increased incidence of symptoms consistent with atopic allergy.

CPT Codes:
82785

LOINC Codes:
19113-0
**IgE, Specific**

**IGES, BTRAST**

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**ORDERING**

**Available Stat:**
No

**Performing Lab:**
ARUP

**Performed:**
Mon-Fri

**Methodology:**
Quantitative ImmunoCAP Fluorescent Enzyme Immunoassay

**Reported:**
2-3 days

**Additional Information:**
It is generally believed that reactivity of Class 2 or below is not an indication for immunotherapy.

A NEGATIVE RESULT CAN OCCUR IN A SENSITIZED INDIVIDUAL WHO HAS NOT BEEN EXPOSED TO A PARTICULAR ANTIGEN FOR A PROLONGED PERIOD OF TIME, AND MAY ALSO OCCUR IN AN INDIVIDUAL WHO HAS VERY RECENTLY SUFFERED A SEVERE ALLERGIC REACTION.

Due to the rise and fall of circulating antibodies to venoms and to penicillin G or V, specimens should be collected no sooner than 2-3 weeks and no later than 6 months after an insect sting or a penicillin exposure.

[List of Available Allergens]

Tests must be ordered individually rather than in (more expensive) panels. See ARUP website for specific allergens available.

Medicare/MediCal will not reimburse testing for specific IgE in a patient who has not previously demonstrated an elevation of total IgE.

Allergen results of 0.10-0.34 kU/L are intended for specialist use as the clinical relevance is undetermined. Even though increasing ranges are reflective of increasing concentrations of allergen-specific IgE, these concentrations may not correlate with the degree of clinical response or skin testing results when challenged with a specific allergen. The correlation of allergy laboratory results with clinical history and in vivoreactivity to specific allergens is essential. A negative test may not rule out clinical allergy or even anaphylaxis.

**Synonyms:**
- Allergy
- Allergen

---

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Gold or red top

**Amount to Collect:**
0.5 mL blood

**Preferred Volume:**
0.25 mL (serum) plus 0.1 mL per additional allergen ordered

**Minimum Volume:**
0.25 mL (serum) plus 0.04 mL per additional allergen ordered

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

**Rejection Criteria:**
Hemolyzed, icteric or lipemic specimens.
PROCESSING

Test Code:
IGES

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:

Refrigerate serum.

Mark the appropriate ARUP test code from the test listing on the reference lab request slip, and order the proper Charge Group of the test in the laboratory computer.

Charge group 1 IGES1
Charge group 2 IGES2
Charge group 3 IGES3
Charge group 4 IGES4
Charge group 5 IGES5

Requests for "Egg Components" should be ordered as: Egg, White; Egg, Whole; Ovomucoid; Ovalbumin

Requests for "Milk Components" should be ordered as: Milk (Cow); Beta-lactoglobulin; Casein; Alpha-lactalbumin

Requests for "Peanut Components" are not covered by this test.

List of Available Allergens

Preferred Volume:
0.25 mL (serum) plus 0.1 mL per additional allergen ordered

Minimum Volume:
0.25 mL (serum) plus 0.04 mL per additional allergen ordered

Rejection Criteria:
Hemolyzed, icteric or lipemic specimens.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

RESULT INTERPRETATION

Units:
kU/L

Reference Interval:
<0.10 kU/L

Additional Information:
It is generally believed that reactivity of Class 2 or below is not an indication for immunotherapy.

A NEGATIVE RESULT CAN OCCUR IN A SENSITIZED INDIVIDUAL WHO HAS NOT BEEN EXPOSED TO A PARTICULAR ANTIGEN FOR A PROLONGED PERIOD OF TIME, AND MAY ALSO OCCUR IN AN INDIVIDUAL WHO HAS VERY RECENTLY SUFFERED A SEVERE ALLERGIC REACTION.

Due to the rise and fall of circulating antibodies to venoms and to penicillin G or V, specimens should be collected no sooner than 2-3 weeks and no later than 6 months after an insect sting or a penicillin exposure.

List of Available Allergens

Tests must be ordered individually rather than in (more expensive) panels. See ARUP website for specific allergens available.

Medicare/MediCal will not reimburse testing for specific IgE in a patient who has not previously demonstrated an elevation of total IgE.
Allergen results of 0.10-0.34 kU/L are intended for specialist use as the clinical relevance is undetermined. Even though increasing ranges are reflective of increasing concentrations of allergen-specific IgE, these concentrations may not correlate with the degree of clinical response or skin testing results when challenged with a specific allergen. The correlation of allergy laboratory results with clinical history and in vivoreactivity to specific allergens is essential. A negative test may not rule out clinical allergy or even anaphylaxis.

**ADMINISTRATIVE**

**CPT Codes:**
- 86003

**LOINC Codes:**
- Varies

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- IGES

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon-Fri

**Methodology:**
- Quantitative ImmunoCAP Fluorescent Enzyme Immunoassay

**Collect:**
- Gold or red top

**Amount to Collect:**
- 0.5 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 0.25 mL (serum) plus 0.1 mL per additional allergen ordered

**Minimum Volume:**
- 0.25 mL (serum) plus 0.04 mL per additional allergen ordered

**Rejection Criteria:**
- Hemolyzed, icteric or lipemic specimens.

**Specimen Preparation:**

Refrigerate serum.

Mark the appropriate ARUP test code from the test listing on the reference lab request slip, and order the proper Charge Group of the test in the laboratory computer.

Charge group 1 IGES1
Charge group 2 IGES2
Charge group 3 IGES3
Charge group 4 IGES4
Charge group 5 IGES5

Requests for “Egg Components” should be ordered as: Egg, White; Egg, Whole; Ovomucoid; Ovalbumin

Requests for “Milk Components” should be ordered as: Milk (Cow); Beta-lactoglobulin; Casein; Alpha-lactalbumin

Requests for “Peanut Components” are not covered by this test.
List of Available Allergens

Units:

kU/L

Reference Interval:

<0.10 kU/L

Synonyms:

- Allergy
- Allergen

Stability (from collection to initiation):

After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Reported:

2-3 days

Additional Information:

It is generally believed that reactivity of Class 2 or below is not an indication for immunotherapy.

A NEGATIVE RESULT CAN OCCUR IN A SENSITIZED INDIVIDUAL WHO HAS NOT BEEN EXPOSED TO A PARTICULAR ANTIGEN FOR A PROLONGED PERIOD OF TIME, AND MAY ALSO OCCUR IN AN INDIVIDUAL WHO HAS VERY RECENTLY SUFFERED A SEVERE ALLERGIC REACTION.

Due to the rise and fall of circulating antibodies to venoms and to penicillin G or V, specimens should be collected no sooner than 2-3 weeks and no later than 6 months after an insect sting or a penicillin exposure.

List of Available Allergens

Tests must be ordered individually rather than in (more expensive) panels. See ARUP website for specific allergens available.

Medicare/MediCal will not reimburse testing for specific IgE in a patient who has not previously demonstrated an elevation of total IgE.

Allergen results of 0.10-0.34 kU/L are intended for specialist use as the clinical relevance is undetermined. Even though increasing ranges are reflective of increasing concentrations of allergen-specific IgE, these concentrations may not correlate with the degree of clinical response or skin testing results when challenged with a specific allergen. The correlation of allergy laboratory results with clinical history and in vivoreactivity to specific allergens is essential. A negative test may not rule out clinical allergy or even anaphylaxis.

CPT Codes:

86003

LOINC Codes:

Varies
IGF-1, Adult
AIGF1

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS
Reported: 3-5 days

Additional Information:
Insulin-like growth factor I (IGF-I, or somatomedin C), a protein involved in stimulating somatic growth, is regulated principally by growth hormone (GH) and nutritional intake. IGF-I is transported in serum by several proteins; this helps maintain relatively high IGF-I plasma levels and minimizes fluctuations in serum IGF-I concentrations.

Measuring IGF-I is useful in several growth-related disorders. Dwarfism caused by deficiency of growth hormone (hypopituitarism) results in decreased serum levels of IGF-I, while acromegaly (growth hormone excess) results in elevated levels of IGF-I. IGF-I measurements are also helpful in assessing nutritional status; levels are reduced in under-nutrition and restored with a proper diet.

Synonyms:
- IGF1
- Somatomedin C

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum

Stability (from collection to initiation):
- Room temperature 2 days, refrigerated 5 days, frozen 1 week, frozen at -70°C 3 weeks

PROCESSING

Test Code: AIGF1
Test Group: IGF1
Sendout: Yes
Performing Lab: Quest

Specimen Preparation:
Freeze aliquot and send to China Basin for sendout
Preferred Volume: 0.5 mL serum
Minimum Volume:
0.3 mL serum

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen 1 week, frozen at -70C 3 weeks

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
18-19.9 years 108-548
20-24.9 years 83-456
25-29.9 years 63-373
30-39.9 years 53-331
40-49.9 years 52-328
50-59.9 years 50-317
60-69.9 years 41-279
70-79.9 years 34-245
>80 years 34-246

Additional Information:
Insulin-like growth factor I (IGF-I, or somatomedin C), a protein involved in stimulating somatic growth, is regulated principally by growth hormone (GH) and nutritional intake. IGF-I is transported in serum by several proteins; this helps maintain relatively high IGF-I plasma levels and minimizes fluctuations in serum IGF-I concentrations.

Measuring IGF-I is useful in several growth-related disorders. Dwarfism caused by deficiency of growth hormone (hypopituitarism) results in decreased serum levels of IGF-I, while acromegaly (growth hormone excess) results in elevated levels of IGF-I. IGF-I measurements are also helpful in assessing nutritional status; levels are reduced in under-nutrition and restored with a proper diet.

ADMINISTRATIVE

CPT Codes:
84305-90

COMPLETE VIEW

Available Stat:
No
Test Code:
AIGF1
Test Group:
IGF1
Performing Lab:
Quest
Sendout:
Yes
Methodology:
LC/MS
Collect:
Red top or Gold top
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum

**Specimen Preparation:**
Freeze aliquot and send to China Basin for sendout

**Units:**
ng/mL

**Reference Interval:**
- 18-19.9 years: 108-548
- 20-24.9 years: 83-456
- 25-29.9 years: 63-373
- 30-39.9 years: 53-331
- 40-49.9 years: 52-328
- 50-59.9 years: 50-317
- 60-69.9 years: 41-279
- 70-79.9 years: 34-245
- >80 years: 34-246

**Synonyms:**
- IGF1
- Somatomedin C

**Stability (from collection to initiation):**
Room temperature 2 days, refrigerated 5 days, frozen 1 week, frozen at -70°C 3 weeks

**Reported:**
3-5 days

**Additional Information:**
Insulin-like growth factor I (IGF-I, or somatomedin C), a protein involved in stimulating somatic growth, is regulated principally by growth hormone (GH) and nutritional intake. IGF-I is transported in serum by several proteins; this helps maintain relatively high IGF-I plasma levels and minimizes fluctuations in serum IGF-I concentrations.

Measuring IGF-I is useful in several growth-related disorders. Dwarfism caused by deficiency of growth hormone (hypopituitarism) results in decreased serum levels of IGF-I, while acromegaly (growth hormone excess) results in elevated levels of IGF-I. IGF-I measurements are also helpful in assessing nutritional status; levels are reduced in under-nutrition and restored with a proper diet.

**CPT Codes:**
84305-90
IGF-Binding Protein 3
BP3

ORDERING

Available Stat:
No
Performing Lab:
ESCI
Methodology:
RIA
Reported:
Test run 2x weekly. Turnaround time: 3-5 days.

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.03 mL serum

PROCESSING

Test Code:
BP3
Sendout:
Yes
Performing Lab:
ESCI
Specimen Preparation:
Separate serum within 1 hour. Freeze serum in plastic vial at -20C.
Preferred Volume:
1 mL serum
Minimum Volume:
0.03 mL serum

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:

<table>
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<tr>
<th>Age</th>
<th>Range</th>
<th>Mean</th>
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<tbody>
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<td>Premature</td>
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<td>0.9 mg/L</td>
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<tr>
<td>0-1 month</td>
<td>0.9-2.3 mg/L</td>
<td>1.6 mg/L</td>
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<td>2-3 months</td>
<td>0.4-2.2 mg/L</td>
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<tr>
<td>4-5 months</td>
<td>1.0-2.3 mg/L</td>
<td>1.5 mg/L</td>
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<td>6-11 months</td>
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<td>Mean</td>
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</tr>
<tr>
<td>0-1 months</td>
<td>0.4-1.7 mg/L</td>
<td>0.9 mg/L</td>
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<td>2-3 months</td>
<td>0.5-2.1 mg/L</td>
<td>1.3 mg/L</td>
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<tr>
<td>4-5 months</td>
<td>0.6-2.4 mg/L</td>
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<tr>
<td>6-11 months</td>
<td>0.5-2.4 mg/L</td>
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<tr>
<td>1-4 years</td>
<td>0.8-3.0 mg/L</td>
<td>2.1 mg/L</td>
</tr>
<tr>
<td>5-6 years</td>
<td>1.5-3.4 mg/L</td>
<td>2.4 mg/L</td>
</tr>
<tr>
<td>7-8 years</td>
<td>2.1-4.2 mg/L</td>
<td>3.0 mg/L</td>
</tr>
<tr>
<td>9-11 years</td>
<td>2.0-4.8 mg/L</td>
<td>3.3 mg/L</td>
</tr>
<tr>
<td>12-13 years</td>
<td>2.1-6.2 mg/L</td>
<td>3.8 mg/L</td>
</tr>
<tr>
<td>14-15 years</td>
<td>2.2-5.9 mg/L</td>
<td>4.2 mg/L</td>
</tr>
<tr>
<td>16-18 years</td>
<td>2.5-4.8 mg/L</td>
<td>3.5 mg/L</td>
</tr>
<tr>
<td>19-30 years</td>
<td>2.0-4.2 mg/L</td>
<td>3.0 mg/L</td>
</tr>
<tr>
<td>31-70 years</td>
<td>1.9-3.6 mg/L</td>
<td>2.7 mg/L</td>
</tr>
</tbody>
</table>

**Administrative**

**CPT Codes:**
- 83519-90

**LOINC Codes:**
- 2483-6

**Complete View**

**Available Stat:**
- No

**Test Code:**
- BP3

**Performing Lab:**
- ESCi

**Sendout:**
- Yes

**Methodology:**
- RIA

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.03 mL serum

**Specimen Preparation:**
- Separate serum within 1 hour. Freeze serum in plastic vial at -20C.

**Units:**
- mg/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature</td>
<td>0.3-1.4 mg/L</td>
<td>0.9 mg/L</td>
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<tr>
<td>0-1 month</td>
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<td>0.9 mg/L</td>
</tr>
<tr>
<td>2-3 months</td>
<td>0.9-2.3 mg/L</td>
<td>1.6 mg/L</td>
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<tr>
<td>4-5 months</td>
<td>0.4-2.2 mg/L</td>
<td>1.5 mg/L</td>
</tr>
<tr>
<td>6-11 months</td>
<td>1.0-2.3 mg/L</td>
<td>1.5 mg/L</td>
</tr>
<tr>
<td>Full term</td>
<td>Range</td>
<td>Mean</td>
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<tr>
<td>0-1 months</td>
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<td>0.9 mg/L</td>
</tr>
<tr>
<td>Age Range</td>
<td>Range</td>
<td>Mean</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------</td>
<td>------</td>
</tr>
<tr>
<td>2-3 months</td>
<td>0.5-2.1 mg/L</td>
<td>1.3 mg/L</td>
</tr>
<tr>
<td>4-5 months</td>
<td>0.6-2.4 mg/L</td>
<td>1.4 mg/L</td>
</tr>
<tr>
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<td>0.5-2.4 mg/L</td>
<td>1.4 mg/L</td>
</tr>
<tr>
<td>1-4 years</td>
<td>0.8-3.0 mg/L</td>
<td>2.1 mg/L</td>
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<tr>
<td>5-6 years</td>
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<tr>
<td>31-70 years</td>
<td>1.9-3.6 mg/L</td>
<td>2.7 mg/L</td>
</tr>
</tbody>
</table>

**Reported:**
Test run 2x weekly. Turnaround time: 3-5 days.

**CPT Codes:**
- 83519-90

**LOINC Codes:**
- 2483-6
IGF-I, Pediatric
PIGF1

ORDERING

Available Stat:
No
Performing Lab:
Esoterix
Methodology:
Blocking RIA after acid:alcohol extraction
Reported:
Test performed Monday-Saturday. Turnaround time: 3-5 days.
Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "IGF-I" (test code IGF1). It requires approval if ordered in patients over the age of 20
Synonyms:
- Somatomedin C
- IGF-1 ultrasensitive

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.1 mL serum

PROCESSING

Test Code:
PIGF1
Test Group:
IGF1
Sendout:
Yes
Performing Lab:
Esoterix
Specimen Preparation:
Aliquot serum and freeze. Ship frozen to China Basin
Preferred Volume:
1 mL serum
Minimum Volume:
0.1 mL serum

RESULT INTERPRETATION

Units:
**Reference Interval:**

Newborns and Infants  
Age | Term (ng/mL) | Preterm (ng/mL)  
---|---|---  
Birth | 15-109 | 21-93  
1 day-2 months | 15-109 | 23-163  
3-4 months | 7-124 | 23-171  
5-6 months | 7-93 | 15-132  
7-12 months | 15-101 | 15-179  

Children  
Age | Male Range (ng/mL) | Female Range (ng/mL)  
---|---|---  
1-2 years | 30-122 | 56-144  

Male Pubertal Ranges by Tanner Stage  
Age | Tanner 1 (ng/mL) | Tanner 2 & 3 (ng/mL) | Tanner 4 & 5 (ng/mL)  
---|---|---|---  
3 years | 20-141 |  
4 years | 25-157 |  
5 years | 30-174 |  
6 years | 37-192 |  
7 years | 44-211 |  
8 years | 52-231 | 39-264 |  
9 years | 61-252 | 52-304 |  
10 years | 71-275 | 67-347 |  
11 years | 82-299 | 86-393 | 277-673 |  
12 years | 93-324 | 106-443 | 265-652 |  
13 years | 106-350 | 130-497 | 241-612 |  
14 years | 120-377 | 156-554 | 220-574 |  
15 years | 127-391 | 185-616 | 199-537 |  
16 years | 201-648 | 180-501 |  
17 years | 211-648 | 180-501 |  
18 years | 248-612 | 194-516 |  

Female Pubertal ranges by Tanner Stage  
Age | Tanner 1 (ng/mL) | Tanner 2 (ng/mL) | Tanner 3 (ng/mL) | Tanner 4 & 5 (ng/mL)  
---|---|---|---|---  
3 years | 26-162 |  
4 years | 32-179 |  
5 years | 39-198 |  
6 years | 47-217 |  
7 years | 55-238 |  
8 years | 64-259 | 89-369 |  
9 years | 74-282 | 96-399 | 192-568 |  
10 years | 85-306 | 104-431 | 192-568 | 279-664 |  
11 years | 97-332 | 112-466 | 192-568 | 268-646 |  
12 years | 110-358 | 121-504 | 192-568 | 248-612 |  
13 years | 131-545 | 192-568 | 229-579 |  
14 years | 136-566 | 192-568 | 211-547 |  
15 years | 192-568 | 194-516 |  
16 years | 177-487 |  
17 years | 162-458 |  
18 years | 147-430 |  

Adults  
Age | Male (ng/mL) | Female (ng/mL)  
---|---|---  
19-20 years | 281-510 | 217-475 |  
21-30 years | 155-432 | 87-368 |  
31-40 years | 132-333 | 106-368 |  
41-50 years | 121-237 | 118-298 |  

Test information subject to change.
Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "IGF-1" (test code IGF1). It requires approval if ordered in patients over the age of 20

<table>
<thead>
<tr>
<th>Age</th>
<th>Term (ng/mL)</th>
<th>Preterm (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td>15-109</td>
<td>21-93</td>
</tr>
<tr>
<td>1 day-2 months</td>
<td>15-109</td>
<td>23-163</td>
</tr>
<tr>
<td>3-4 months</td>
<td>7-124</td>
<td>23-171</td>
</tr>
<tr>
<td>5-6 months</td>
<td>7-93</td>
<td>15-132</td>
</tr>
<tr>
<td>7-12 months</td>
<td>15-101</td>
<td>15-179</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male Range (ng/mL)</th>
<th>Female Range (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 years</td>
<td>30-122</td>
<td>56-144</td>
</tr>
</tbody>
</table>
### Male Pubertal Ranges by Tanner Stage

<table>
<thead>
<tr>
<th>Age</th>
<th>Tanner 1 (ng/mL)</th>
<th>Tanner 2 &amp; 3 (ng/mL)</th>
<th>Tanner 4 &amp; 5 (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>20-141</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>6 years</td>
<td>37-192</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 years</td>
<td>44-211</td>
<td></td>
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</tr>
<tr>
<td>8 years</td>
<td>52-231</td>
<td>39-264</td>
<td></td>
</tr>
<tr>
<td>9 years</td>
<td>61-252</td>
<td>52-304</td>
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<tr>
<td>10 years</td>
<td>71-275</td>
<td>67-347</td>
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</tr>
<tr>
<td>11 years</td>
<td>82-299</td>
<td>86-393</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>18 years</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Female Pubertal ranges by Tanner Stage

<table>
<thead>
<tr>
<th>Age</th>
<th>Tanner 1 (ng/mL)</th>
<th>Tanner 2 (ng/mL)</th>
<th>Tanner 3 (ng/mL)</th>
<th>Tanner 4 &amp; 5 (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>26-162</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years</td>
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</tr>
<tr>
<td>5 years</td>
<td>39-198</td>
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<td></td>
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</tr>
<tr>
<td>6 years</td>
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<tr>
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<td>55-238</td>
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<tr>
<td>9 years</td>
<td>74-282</td>
<td>96-399</td>
<td>192-568</td>
<td></td>
</tr>
<tr>
<td>10 years</td>
<td>85-306</td>
<td>104-431</td>
<td>192-568</td>
<td>279-664</td>
</tr>
<tr>
<td>11 years</td>
<td>97-332</td>
<td>112-466</td>
<td>192-568</td>
<td>268-646</td>
</tr>
<tr>
<td>12 years</td>
<td>110-358</td>
<td>121-504</td>
<td>192-568</td>
<td>248-612</td>
</tr>
<tr>
<td>13 years</td>
<td>131-545</td>
<td>192-568</td>
<td>229-579</td>
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<tr>
<td>14 years</td>
<td>136-566</td>
<td>192-568</td>
<td>211-547</td>
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<tr>
<td>15 years</td>
<td>192-568</td>
<td></td>
<td>194-516</td>
<td></td>
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<tr>
<td>16 years</td>
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<td></td>
<td>177-487</td>
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<tr>
<td>17 years</td>
<td></td>
<td></td>
<td>162-458</td>
<td></td>
</tr>
<tr>
<td>18 years</td>
<td></td>
<td></td>
<td>147-430</td>
<td></td>
</tr>
</tbody>
</table>

### Adults

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (ng/mL)</th>
<th>Female (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-20 years</td>
<td>281-510</td>
<td>217-475</td>
</tr>
<tr>
<td>21-30 years</td>
<td>155-432</td>
<td>87-368</td>
</tr>
<tr>
<td>31-40 years</td>
<td>132-333</td>
<td>106-368</td>
</tr>
<tr>
<td>41-50 years</td>
<td>121-237</td>
<td>118-298</td>
</tr>
<tr>
<td>51-60 years</td>
<td>68-245</td>
<td>53-287</td>
</tr>
<tr>
<td>61-70 years</td>
<td>60-220</td>
<td>75-263</td>
</tr>
<tr>
<td>71-80 years</td>
<td>36-215</td>
<td>54-205</td>
</tr>
</tbody>
</table>

### Synonyms:
- Somatomedin C
- IGF-1 ultrasensitive

### Reported:
- Test performed Monday-Saturday. Turnaround time: 3-5 days.

### Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "IGF-I" (test code IGF1). It requires approval if ordered in patients over the age of 20.

### CPT Codes:
- 84305-90

### LOINC Codes:
IGF-II
IGF2

ORDERING

Available Stat: No
Performing Lab: ESCI
Methodology: RIA
Reported:
Test run Monday-Wednesday-Friday. Turnaround: 3-6 days.
Additional Information:
In growth hormone deficiency, levels are typically less than the 5th percentile for age, in the range of 51-199.

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.1 mL serum

PROCESSING

Test Code: IGF2
Sendout: Yes
Performing Lab: ESCI
Specimen Preparation:
Freeze serum at -20C.
Preferred Volume: 1 mL serum
Minimum Volume: 0.1 mL serum

RESULT INTERPRETATION

Units: µg/L
Reference Interval:
Prepuberty: 334-642 µg/L
Puberty: 245-737 µg/L
>= 18 year old: 288-736 µg/L
Additional Information:
In growth hormone deficiency, levels are typically less than the 5th percentile for age, in the range of 51-199.
ADMINISTRATIVE

CPT Codes:
83519-90

LOINC Codes:
2485-1

COMPLETE VIEW

Available Stat:
No

Test Code:
IGF2

Performing Lab:
ESCI

Sendout:
Yes

Methodology:
RIA

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Freeze serum at -20C.

Units:
µg/L

Reference Interval:
Prepuberty: 334-642 µg/L
Puberty: 245-737 µg/L
>= 18 year old: 288-736 µg/L

Reported:
Test run Monday-Wednesday-Friday. Turnaround: 3-6 days.

Additional Information:
In growth hormone deficiency, levels are typically less than the 5th percentile for age, in the range of 51-199.

CPT Codes:
83519-90

LOINC Codes:
2485-1
IgG Index, CSF
IGGI, IGGIS

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Thursday (day shift)
Methodology:
Rate nephelometry
Reported:
1-8 days
Additional Information:

Index = (CSF IgG/Albumin)/ (serum IgG/Albumin)

Reference range data applies only to lumbar CSF.

Contamination of CSF with blood due to a traumatic LP can significantly elevate the IgG index.


Immunoelectrophoresis is not offered on CSF.

the CSF IgG Synthesis Rate does not provide any additional information and is less sensitive than the CSF IgG Index. As such the Clinical Laboratories does not calculate or report the CSF IgG Synthesis Rate.

References:

Synonyms:
• CSF IgG Synthesis Rate

COLLECTION

Sample Type:
CSF AND Serum
Collect:
CSF tube or sterile collection tube and Gold top
Amount to Collect:
1 mL CSF AND 1 mL blood
Preferred Volume:
1 mL CSF AND 0.5 mL serum
Minimum Volume:
0.5 ML CSF AND 0.5 mL serum
Remarks:
Both CSF and serum samples required, preferably collected at the same time (not more than 72 hours). CSF specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Unacceptable Conditions:
Lipemic samples
PROCESSING

Test Code:
IGGI and IGGIS

Test Group:
IgG

Performing Lab:
Immunology

Specimen Preparation:
Order IGGI for CSF and IGGIS for serum. Freeze samples at -20°C

Preferred Volume:
1 mL CSF AND 0.5 mL serum

Minimum Volume:
0.5 mL CSF AND 0.5 mL serum

Unacceptable Conditions:
Lipemic samples

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
- CSF IgG: 0.3-4.3 mg/dL
- CSF Albumin: 5.4-31.8 mg/dL
- Serum IgG (> 10 year old): 672-1760 mg/dL
- Serum Albumin (> 18 year old): 3600-4800 mg/dL
- IgG Index, CSF: 0.3-0.6

Additional Information:

Index = (CSF IgG/Albumin)/ (serum IgG/Albumin)

Reference range data applies only to lumbar CSF.

Contamination of CSF with blood due to a traumatic LP can significantly elevate the IgG index.


Immunelectrophoresis is not offered on CSF.

the CSF IgG Synthesis Rate does not provide any additional information and is less sensitive than the CSF IgG Index. As such the Clinical Laboratories does not calculate or report the CSF IgG Synthesis Rate.

References:

ADMINISTRATIVE

CPT Codes:
82784; 82040; 83883; 82784
Available Stat: No

Test Code: IGGI and IGGIS

Test Group: IgG

Performing Lab: Immunology

Performed: Thursday (day shift)

Methodology: Rate nephelometry

Remarks: Both CSF and serum samples required, preferably collected at the same time (not more than 72 hours). CSF specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect: CSF tube or sterile collection tube and Gold top

Amount to Collect: 1 mL CSF AND 1 mL blood

Sample Type: CSF AND Serum

Preferred Volume: 1 mL CSF AND 0.5 mL serum

Minimum Volume: 0.5 ML CSF AND 0.5 mL serum

Unacceptable Conditions: Lipemic samples

Specimen Preparation: Order IGGI for CSF and IGGIS for serum. Freeze samples at -20oC

Units: mg/dL

Reference Interval:

- CSF IgG 0.3-4.3 mg/dL
- CSF Albumin 5.4-31.8 mg/dL
- Serum IgG (> 10 year old) 672-1760 mg/dL
- Serum Albumin (> 18 year old) 3600-4800 mg/dL
- IgG Index, CSF 0.3-0.6

Synonyms: CSF IgG Synthesis Rate

Reported: 1-8 days

Additional Information:

\[
\text{Index} = \frac{\text{CSF IgG/Albumin}}{\text{serum IgG/Albumin}}
\]

Reference range data applies only to lumbar CSF.

Contamination of CSF with blood due to a traumatic LP can significantly elevate the IgG index.


Immunoelectrophoresis is not offered on CSF.

the CSF IgG Synthesis Rate does not provide any additional information and is less sensitive than the CSF IgG Index. As such the Clinical Laboratories does not calculate or report the CSF IgG Synthesis Rate.
References:

CPT Codes:
82784; 82040; 83883; 82784
**IgG, serum**

**IGG**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday (day shift)

**Methodology:**
- Rate nephelometry

**Reported:**
- 1-3 days

**Additional Information:**

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### PROCESSING

**Test Code:**
- IGG

**Test Group:**
- IgG

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Refrigerate

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### RESULT INTERPRETATION

**Units:**
**mg/dL**

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord Blood</td>
<td>636-1606</td>
</tr>
<tr>
<td>1 months</td>
<td>251-906</td>
</tr>
<tr>
<td>2 months</td>
<td>206-601</td>
</tr>
<tr>
<td>3 months</td>
<td>176-581</td>
</tr>
<tr>
<td>4 months</td>
<td>196-558</td>
</tr>
<tr>
<td>5 months</td>
<td>172-814</td>
</tr>
<tr>
<td>6 months</td>
<td>215-704</td>
</tr>
<tr>
<td>7-9 months</td>
<td>217-904</td>
</tr>
<tr>
<td>10-12 months</td>
<td>294-1069</td>
</tr>
<tr>
<td>1-3 years</td>
<td>345-1213</td>
</tr>
<tr>
<td>4-5 years</td>
<td>463-1236</td>
</tr>
<tr>
<td>6-10 years</td>
<td>608-1572</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>672-1760</td>
</tr>
</tbody>
</table>

**Additional Information:**


**ADMINISTRATIVE**

**CPT Codes:**

- 82784

**LOINC Codes:**

- 2465-3

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- IGG

**Test Group:**

- IgG

**Performing Lab:**

- Immunology

**Performed:**

- Monday-Friday (day shift)

**Methodology:**

- Rate nephelometry

**Collect:**

- Gold top

**Amount to Collect:**

- 1 mL blood

**Sample Type:**

- Serum

**Preferred Volume:**

- 0.5 mL serum

**Minimum Volume:**

- 0.3 mL serum

**Unacceptable Conditions:**

- Lipemic samples

**Specimen Preparation:**

- Refrigerate

**Units:**

- mg/dL

**Reference Interval:**

- Printed 06/07/19

Test information subject to change
<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord Blood</td>
<td>636-1606 mg/dL</td>
</tr>
<tr>
<td>1 months</td>
<td>251-906 mg/dL</td>
</tr>
<tr>
<td>2 months</td>
<td>206-601 mg/dL</td>
</tr>
<tr>
<td>3 months</td>
<td>176-581 mg/dL</td>
</tr>
<tr>
<td>4 months</td>
<td>196-558 mg/dL</td>
</tr>
<tr>
<td>5 months</td>
<td>172-814 mg/dL</td>
</tr>
<tr>
<td>6 months</td>
<td>215-704 mg/dL</td>
</tr>
<tr>
<td>7-9 months</td>
<td>217-904 mg/dL</td>
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<tr>
<td>10-12 months</td>
<td>294-1089 mg/dL</td>
</tr>
<tr>
<td>1-3 years</td>
<td>345-1213 mg/dL</td>
</tr>
<tr>
<td>4-5 years</td>
<td>463-1236 mg/dL</td>
</tr>
<tr>
<td>6-10 years</td>
<td>608-1572 mg/dL</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>672-1760 mg/dL</td>
</tr>
</tbody>
</table>

**Reported:**
1-3 days

**Additional Information:**

**CPT Codes:**
82784

**LOINC Codes:**
2465-3
IGL Break-apart Rearrangement FISH
IGL22, BIGL22

ORDERING
Performing Lab: Cytogenetics
Performed: Monday - Friday, 9 am to 5 pm
Methodology: FISH
Reported: 7-14 days
Synonyms:
- IGL22
- BIGL22
- 22q11 break-apart FISH

COLLECTION
Sample Type: Blood and bone marrow
Collect:
- Blood and bone marrow aspirate: Dark green top
- Bone marrow core: Sterile container
Amount to Collect:
- See Preferred Volume
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Stability (from collection to initiation):
- 2 days
Storage/Transport Temperature:
- Room temperature
Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen

PROCESSING
Test Code:
- Blood: BIGL22
- Bone marrow: IGL22
Performing Lab: Cytogenetics
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
Blood: 1 mL  
Bone marrow aspirate: 1 mL  
Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
- 88271x2, 88275x1

---

**COMPLETE VIEW**

**Test Code:**
- Blood: BIGL22  
- Bone marrow: IGL22

**Performing Lab:**
- Cytogenetics

**Performed:**
- Monday - Friday, 9 am to 5 pm

**Methodology:**
- FISH

**Collect:**
- Blood and bone marrow aspirate: Dark green top  
- Bone marrow core: Sterile container

**Amount to Collect:**
- See Preferred Volume

**Sample Type:**
- Blood and bone marrow

**Preferred Volume:**
- Blood: 2 mL  
- Bone marrow aspirate: 2 mL  
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL  
- Bone marrow aspirate: 1 mL  
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen

**Synonyms:**
- IGL22  
- BIGL22  
- 22q11 break-apart FISH

**Storage/Transport Temperature:**
- Room temperature

**Stability (from collection to initiation):**
- 2 days

**Reported:**
- 7-14 days

**CPT Codes:**
- 88271x2, 88275x1
**IgM, serum**

**IGM**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday (day shift)

**Methodology:**
- Rate nephelometry

**Reported:**
- 1-3 days

**Additional Information:**

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### PROCESSING

**Test Code:**
- IGM

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Refrigerate

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Unacceptable Conditions:**
- Lipemic samples

### RESULT INTERPRETATION

**Units:**
- mg/dL

**Reference Interval:**
- Printed 06/07/19

Test information subject to change
<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Range (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord Blood</td>
<td>6-25</td>
</tr>
<tr>
<td>1 months</td>
<td>20-87</td>
</tr>
<tr>
<td>2 months</td>
<td>17-105</td>
</tr>
<tr>
<td>3 months</td>
<td>24-89</td>
</tr>
<tr>
<td>4 months</td>
<td>27-101</td>
</tr>
<tr>
<td>5 months</td>
<td>33-108</td>
</tr>
<tr>
<td>6 months</td>
<td>35-102</td>
</tr>
<tr>
<td>7-9 months</td>
<td>34-126</td>
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<tr>
<td>10-12 months</td>
<td>41-149</td>
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<tr>
<td>1-3 years</td>
<td>43-200</td>
</tr>
<tr>
<td>4-5 years</td>
<td>43-196</td>
</tr>
<tr>
<td>6-10 years</td>
<td>48-242</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>39-333</td>
</tr>
</tbody>
</table>

Additional Information:
4 months  27-101 mg/dL
5 months  33-108 mg/dL
6 months  35-102 mg/dL
7-9 months 34-126 mg/dL
10-12 months 41-149 mg/dL
1-3 years  43-200 mg/dL
4-5 years  43-196 mg/dL
6-10 years  48-242 mg/dL
>10 years  39-333 mg/dL

**Reported:**

1-3 days

**Additional Information:**


**CPT Codes:**

82784

**LOINC Codes:**

2472-9
IL28B Genotype

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run 1x per week as needed, Tuesday or Thursday, day shift only
Methodology: PCR followed by reverse dot blot hybridization with allele-specific probes
Reported: 10-14 days
Additional Information: An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Patients infected with Hepatitis C are often treated with pegylated interferon/ribavirin therapy (PEG/RBV). The sustained viral response to this therapy can be predicted by genotyping of SNPs rs12979860 (C>T) and rs8099917 (T>G).

Thus, a C/C genotype at rs12979860 represents a responder allele and is associated with a 2-3 fold greater rate of SVR compared to C/T and T/T alleles.

Conversely, there is evidence that heterozygosity for the C/T genotype of rs12979860, when coupled with the T/T genotype of SNP rs8099917 (T>G), predicts a less favorable outcome than the C/C genotype alone, but a higher SVR than the T/G or G/G genotypes at rs8099917.

Thus, genotyping of both SNPs is warranted for individuals infected with Hepatitis C and contemplating PEG/RBV therapy.

This PCR based allele-specific oligonucleotide assay will genotype individuals at both rs12979860 and rs8099917 and provide favorable and less favorable SVR prediction rates based on the combined genotypes.

Synonyms: Interleukin 28B, rs12979860, rs8099917

COLLECTION

Sample Type: EDTA Whole blood
Collect: Lavender top (EDTA)
Amount to Collect: 3 mL blood
Preferred Volume: 3 mL
Minimum Volume: 0.5 mL
Remarks: Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.
Stability (from collection to initiation): Refrigerated 1 week
Unacceptable Conditions: Insufficient sample received. Samples > 5 days old when received
PROCESSING

Test Code:
   IL28B
Performing Lab:
   Medical Genomics - Molecular Diagnostics
Specimen Preparation:
   Do not freeze blood. Refrigerate sample if storage is required.
   Ship to China Basin Molecular Diagnostics
Preferred Volume:
   3 mL
Minimum Volume:
   0.5 mL
Unacceptable Conditions:
   Insufficient sample received.
   Samples > 5 days old when received
Stability (from collection to initiation):
   Refrigerated 1 week

RESULT INTERPRETATION

Reference Interval:
   See ‘Additional information’
Additional Information:
   An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Patients infected with Hepatitis C are often treated with pegylated interferon/ribavirin therapy (PEG/RBV). The sustained viral response to this therapy can be predicted by genotyping of SNPs rs12979860 (C>T) and rs8099917 (T>G).

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Thus, genotyping of both SNPs is warranted for individuals infected with Hepatitis C and contemplating PEG/RBV therapy.

This PCR based allele-specific oligonucleotide assay will genotype individuals at both rs12979860 and rs8099917 and provide favorable and less favorable SVR prediction rates based on the combined genotypes.

ADMINISTRATIVE

CPT Codes:
   81400
LDT or Modified FDA:
   Yes

COMPLETE VIEW

Available Stat:
   No
Test Code:
   IL28B
Performing Lab:
   Medical Genomics - Molecular Diagnostics
Performed:
Run 1x per week as needed, Tuesday or Thursday, day shift only

Methodology:
PCR followed by reverse dot blot hybridization with allele-specific probes

Remarks:
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top (EDTA)

Amount to Collect:
3 mL blood

Sample Type:
EDTA Whole blood

Preferred Volume:
3 mL

Minimum Volume:
0.5 mL

Unacceptable Conditions:
Insufficient sample received.
Samples > 5 days old when received

Specimen Preparation:
Do not freeze blood. Refrigerate sample if storage is required.

Ship to China Basin Molecular Diagnostics

Reference Interval:
See 'Additional information'

Synonyms:
- Interleukin 28B, rs12979860, rs8099917

Stability (from collection to initiation):
Refrigerated 1 week

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Patients infected with Hepatitis C are often treated with pegylated interferon/ribavirin therapy (PEG/RBV). The sustained viral response to this therapy can be predicted by genotyping of SNPs rs12979860 (C>T) and rs8099917 (T>G).

Thus, a C/C genotype at rs12979860 represents a responder allele and is associated with a 2-3 fold greater rate of SVR compared to C/T and T/T alleles.

Conversely, there is evidence that heterozygosity for the C/T genotype of rs12979860, when coupled with the T/T genotype of SNP rs8099917 (T>G), predicts a less favorable outcome than the C/C genotype alone, but a higher SVR than the T/G or G/G genotypes at rs8099917.

Thus, genotyping of both SNPs is warranted for individuals infected with Hepatitis C and contemplating PEG/RBV therapy.

This PCR based allele-specific oligonucleotide assay will genotype individuals at both rs12979860 and rs8099917 and provide favorable and less favorable SVR prediction rates based on the combined genotypes.

CPT Codes:
81400

LDT or Modified FDA:
Yes
Imipramine
IMIP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Liquid Chromatography Tandem Mass Spectrometry
Reported:
Test run Monday-Saturday. Turnaround: 2-5 days.
Additional Information:
Imipramine is a tricyclic antidepressant drug used to treat depression. Therapeutic drug monitoring is used to optimize dose and avoid toxicity.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
IMIP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate serum promptly. Freeze at -20C. Order Quest # 887
Preferred Volume:
3 mL serum
Minimum Volume:
1.5 mL serum
Unacceptable Conditions:
Collected in Gold top

RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
  Therapeutic: 150-250 µg/L for the SUM of active drugs.
  Toxic: >= 500 µg/L

Critical Values:
  Quest Priority-1: >= 600 µg/L

Additional Information:
  Imipramine is a tricyclic antidepressant drug used to treat depression. Therapeutic drug monitoring is used to optimize dose and avoid toxicity.

ADMINISTRATIVE

CPT Codes:
  80174-90

LOINC Codes:
  3690-5

COMPLETE VIEW

Available Stat:
  No

Test Code:
  IMIP

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Liquid Chromatography Tandem Mass Spectrometry

Collect:
  Red top (Gold top NOT acceptable)

Amount to Collect:
  6 mL blood

Sample Type:
  Serum

Preferred Volume:
  3 mL serum

Minimum Volume:
  1.5 mL serum

Unacceptable Conditions:
  Collected in Gold top

Specimen Preparation:
  Separate serum promptly. Freeze at -20°C. Order Quest # 887

Units:
  µg/L (mcg/L)

Reference Interval:
  Therapeutic: 150-250 µg/L for the SUM of active drugs.
  Toxic: >= 500 µg/L

Critical Values:
  Quest Priority-1: >= 600 µg/L

Reported:
  Test run Monday-Saturday. Turnaround: 2-5 days.

Additional Information:
  Imipramine is a tricyclic antidepressant drug used to treat depression. Therapeutic drug monitoring is used to optimize dose and avoid toxicity.

CPT Codes:
80174-90
LOINC Codes:
3690-5
Immature Platelet Fraction
IPF

ORDERING

Performing Lab:
Mission Bay Hematology
Performed:
24 hours per day 7 days per week.
Reported:
4 hours

COLLECTION

Sample Type:
Blood
Collect:
Lavender top
Amount to Collect:
3 mL
Preferred Volume:
3 mL
Minimum Volume:
1 mL (or 250 µL in a Mapp Tube)
Stability (from collection to initiation):
24 Hours at Room Temperature and 48 Hours at Refrigerated Temperature (2-8°C)
Rejection Criteria:
1. Clotted specimens are not acceptable.
2. IPF % will not be reported if platelet <10 x10e9/L.
3. IPF % will not be reported if platelet clumping is observed.

PROCESSING

Test Code:
IPF
Performing Lab:
Mission Bay Hematology
Preferred Volume:
3 mL
Minimum Volume:
1 mL (or 250 µL in a Mapp Tube)
Rejection Criteria:
1. Clotted specimens are not acceptable.
2. IPF % will not be reported if platelet <10 x10e9/L.
3. IPF % will not be reported if platelet clumping is observed.
Stability (from collection to initiation):
24 Hours at Room Temperature and 48 Hours at Refrigerated Temperature (2-8°C)

RESULT INTERPRETATION

Units:
%
Reference Interval:
1.0% - 7.3%
Test Code: IPF
Performing Lab: Mission Bay Hematology
Performed: 24 hours per day 7 days per week.
Collect: Lavender top
Amount to Collect: 3 mL
Sample Type: Blood
Preferred Volume: 3 mL
Minimum Volume: 1 mL (or 250 µL in a Mapp Tube)
Rejection Criteria:
1. Clotted specimens are not acceptable.
2. IPF % will not be reported if platelet <10 x10e9/L.
3. IPF % will not be reported if platelet clumping is observed.
Units: %
Reference Interval: 1.0% - 7.3%
Stability (from collection to initiation):
24 Hours at Room Temperature and 48 Hours at Refrigerated Temperature (2-8°C)
Reported: 4 hours
CPT Codes: 85055
LOINC Codes: 71693-6
Immune Cell Function
ICF

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Luminometer
Reported: 2-3 days
Additional Information: This measurement of cellular mediated immunity may be valuable in a variety of applications including transplantation, management of infectious diseases (e.g., HIV, HCV), autoimmunity, cancer, as well as vaccine and drug development
Synonyms:
- Immunknow
- Cylex

COLLECTION

Sample Type: Heparinized whole blood
Collect:
- Dark green top
Amount to Collect:
- 1 mL blood
Preferred Volume:
- 1 mL
Minimum Volume:
- 0.5 mL
Remarks:
- Must be collected before noon Monday - Thursday.
Stability (from collection to initiation):
- Room temperature 30 hours

PROCESSING

Test Code: ICF
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
- Keep sample at room temperature. Ship immediately to China Basin
Preferred Volume:
- 1 mL
Minimum Volume:
- 0.5 mL
Stability (from collection to initiation):
- Room temperature 30 hours
RESULT INTERPRETATION

Units:
ng/mL ATP

Reference Interval:
<= 225 ng/mL ATP: Low Immune Cell Response
226-524 ng/mL ATP: Moderate Immune Cell Response
>= 525 ng/mL ATP: Strong Immune Cell Response

Additional Information:
This measurement of cellular mediated immunity may be valuable in a variety of applications including transplantation, management of infectious diseases (e.g., HIV, HCV), autoimmunity, cancer, as well as vaccine and drug development

ADMINISTRATIVE

CPT Codes:
86352-90

COMPLETE VIEW

Available Stat:
No

Test Code:
ICF

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Luminometer

Remarks:
Must be collected before noon Monday - Thursday.

Collect:
Dark green top

Amount to Collect:
1 mL blood

Sample Type:
Heparinized whole blood

Preferred Volume:
1 mL

Minimum Volume:
0.5 mL

Specimen Preparation:
Keep sample at room temperature. Ship immediately to China Basin

Units:
ng/mL ATP

Reference Interval:
<= 225 ng/mL ATP: Low Immune Cell Response
226-524 ng/mL ATP: Moderate Immune Cell Response
>= 525 ng/mL ATP: Strong Immune Cell Response

Synonyms:
- Immunknow
- Cylex

Stability (from collection to initiation):
Room temperature 30 hours

Reported:
2-3 days

**Additional Information:**

This measurement of cellular mediated immunity may be valuable in a variety of applications including transplantation, management of infectious diseases (e.g., HIV, HCV), autoimmunity, cancer, as well as vaccine and drug development.

**CPT Codes:**

86352-90
Immune Complexes
IC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
ELISA (C1q binding)
Reported:
Test performed Tuesday, Thursday. Turnaround time: 2-6 days.
Synonyms:
- C1q
- Raji cell assay

COLLECTION

Sample Type:
Serum
Collect:
Red top (on ice) (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Remarks:
Deliver IMMEDIATELY to lab. Only serum drawn within 30 minutes or immediately separated, stored and transported at <= 60C (dry ice) is suitable for assay.
Stability (from collection to initiation):
Refrigerated 2 days, frozen at -20C 1 year.
Unacceptable Conditions:
Collected in Gold top. Received at room temperature or > 30 after collection if unseparated from cells
Rejection Criteria:
Thawed serum or plasma received

PROCESSING

Test Code:
IC
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate immediately under refrigeration. Freeze at -60C in plastic tube and ship on dry ice. Order Quest # 36735
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Unacceptable Conditions:
Collected in Gold top. Received at room temperature or > 30 after collection if unseparated from cells

Rejection Criteria:
Thawed serum or plasma received

Stability (from collection to initiation):
Refrigerated 2 days, frozen at -20C 1 year.

RESULT INTERPRETATION

Units:
µg Eq/mL (mcg Eq/mL)

Reference Interval:
Negative: ≤ 25.1 µg Eq/mL (mcg Eq/mL)

ADMINISTRATIVE

CPT Codes:
86332-90

LOINC Codes:
44392-9

COMPLETE VIEW

Available Stat:
No

Test Code:
IC

Performing Lab:
Quest

Sendout:
Yes

Methodology:
ELISA (C1q binding)

Remarks:
Deliver IMMEDIATELY to lab. Only serum drawn within 30 minutes or immediately separated, stored and transported at ≤ 60C (dry ice) is suitable for assay.

Collect:
Red top (on ice) (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Rejection Criteria:
Thawed serum or plasma received

Unacceptable Conditions:
Collected in Gold top. Received at room temperature or > 30 after collection if unseparated from cells

Specimen Preparation:
Separate immediately under refrigeration. Freeze at -60C in plastic tube and ship on dry ice. Order Quest # 36735

Units:
µg Eq/mL (mcg Eq/mL)
Reference Interval:
   Negative: <= 25.1 µg Eq/mL (mcg Eq/mL)

Synonyms:
   - C1q
   - Raji cell assay

Stability (from collection to initiation):
   Refrigerated 2 days, frozen at -20°C 1 year.

Reported:
   Test performed Tuesday, Thursday. Turnaround time: 2-6 days.

CPT Codes:
   86332-90

LOINC Codes:
   44392-9
Immunofixation Electrophoresis, serum
IFE

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday-Friday (day shift)
Methodology:
Electrophoresis by Helena SPIFE4000
Reported:
2-4 days
Additional Information:
Should be ordered after a screening Protein Electrophoresis. To characterize immunoglobulin class and light chain type of paraproteins. Will also detect small amounts of paraprotein despite normal Serum Protein Electrophoresis. Will only be performed for Cryoglobulin after an assay for Cryoglobulin, Quantitative, has demonstrated a cryoprecipitate sufficient in amount for a successful analysis.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:
- Paraprotein
- IFE

COLLECTION

Sample Type:
Serum
Collect:
Gold or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Refrigerated 1 week.
Unacceptable Conditions:
Plasma sample received

PROCESSING

Test Code:
IFE
Test Group:
IFE
Performing Lab:
China Basin Chemistry
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
   Plasma sample received

Stability (from collection to initiation):
   Refrigerated 1 week.

RESULT INTERPRETATION

Reference Interval:
   Negative. No paraproteins present.

Additional Information:
   Should be ordered after a screening Protein Electrophoresis. To characterize immunoglobulin class and light chain type of paraproteins. Will also detect small amounts of paraprotein despite normal Serum Protein Electrophoresis. Will only be performed for Cryoglobulin after an assay for Cryoglobulin, Quantitative, has demonstrated a cryoprecipitate sufficient in amount for a successful analysis.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

ADMINISTRATIVE

CPT Codes:
   86334

LOINC Codes:
   25700-6

COMPLETE VIEW

Available Stat:
   No

Test Code:
   IFE

Test Group:
   IFE

Performing Lab:
   China Basin Chemistry

Performed:
   Monday-Friday (day shift)

Methodology:
   Electrophoresis by Helena SPIFE4000

Collect:
   Gold or Red top

Amount to Collect:
   2 mL blood

Sample Type:
   Serum

Preferred Volume:
   1 mL serum

Minimum Volume:
   0.3 mL serum

Unacceptable Conditions:
   Plasma sample received

Reference Interval:
   Negative. No paraproteins present.

Synonyms:
   - Paraprotein
   - IFE

Stability (from collection to initiation):
Refrigerated 1 week.

**Reported:**

2-4 days

**Additional Information:**

Should be ordered after a screening Protein Electrophoresis. To characterize immunoglobulin class and light chain type of paraproteins. Will also detect small amounts of paraprotein despite normal Serum Protein Electrophoresis. Will only be performed for Cryoglobulin after an assay for Cryoglobulin, Quantitative, has demonstrated a cryoprecipitate sufficient in amount for a successful analysis.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**CPT Codes:**

86334

**LOINC Codes:**

25700-6
Immunofixation Electrophoresis, urine
IFEU

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday-Friday (day shift)
Methodology:
Electrophoresis by Helena SPIFE4000
Reported:
2-4 days
Additional Information:
To demonstrate monoclonal nature of urinary light chains. Urinary paraproteins may be detectable even when Protein Electrophoresis is normal.
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
Synonyms:
- paraprotein
- IFE

COLLECTION

Sample Type:
24 hour urine collection or random urine
Collect:
24 hour urine collection container or urine cup
Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)
Preferred Volume:
10 mL urine
Minimum Volume:
6 mL urine
Stability (from collection to initiation):
Refrigerated 1 week.

PROCESSING

Test Code:
IFEU
Test Group:
IFE
Performing Lab:
China Basin Chemistry
Preferred Volume:
10 mL urine
Minimum Volume:
6 mL urine
Stability (from collection to initiation):
Refrigerated 1 week.
RESULT INTERPRETATION

Reference Interval:
Negative. No paraproteins present.

Additional Information:
To demonstrate monoclonal nature of urinary light chains. Urinary paraproteins may be detectable even when Protein Electrophoresis is normal.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

ADMINISTRATIVE

CPT Codes:
86335

LOINC Codes:
13440-3

COMPLETE VIEW

Available Stat:
No

Test Code:
IFEU

Test Group:
IFE

Performing Lab:
China Basin Chemistry

Performed:
Monday-Friday (day shift)

Methodology:
Electrophoresis by Helena SPIFE4000

Collect:
24 hour urine collection container or urine cup

Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)

Sample Type:
24 hour urine collection or random urine

Preferred Volume:
10 mL urine

Minimum Volume:
6 mL urine

Reference Interval:
Negative. No paraproteins present.

Synonyms:
• paraprotein
• IFE

Stability (from collection to initiation):
Refrigerated 1 week.

Reported:
2-4 days

Additional Information:
To demonstrate monoclonal nature of urinary light chains. Urinary paraproteins may be detectable even when Protein Electrophoresis is normal.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
CPT Codes:
86335

LOINC Codes:
13440-3
Immunoablobulin G Subclasses (1, 2, 3, 4)

**ORDERING**

**Ordering Recommendations:**
Do not order for total IgG measurements. Secondary test in suspected immunoglobulin deficiency. Do not order before IgG, IgA, and IgM measurements are performed.

**Available Stat:**
ARUP

**Performed:**
Mon-Sat

**Methodology:**
Quantitative Nephelometry

**Reported:**
1-3 days

**Synonyms:**
- Gamma-Globulins, Quantitative
- IgG 1, 2, 3, 4
- IgG Subclasses
- Subclasses, IgG

**COLLECTION**

**Collect:**
Serum separator tube.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 2 hours; Refrigerated: 8 days; Frozen: 6 months

**Storage/Transport Temperature:**
Refrigerated.

**PROCESSING**

**Test Code:**
IGGSUB

**ARUP Test Code:**
0050577

**Sendout:**
Yes

**Specimen Preparation:**
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.45 mL)

**Stability (from collection to initiation):**
After separation from cells: Ambient: 2 hours; Refrigerated: 8 days; Frozen: 6 months

**Storage/Transport Temperature:**
Refrigerated.

**RESULT INTERPRETATION**

**Reference Interval:**

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunoglobulin G Subclass 1</td>
<td>Cord blood: 435-1084 mg/dL 5-6 years: 330-1065 mg/dL</td>
</tr>
<tr>
<td></td>
<td>0-2 months: 218-498 mg/dL 7-8 years: 225-1100 mg/dL</td>
</tr>
</tbody>
</table>
### Immunoglobulin G Subclass 2

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Range in mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-5 months</td>
<td>143-394 mg/dL</td>
</tr>
<tr>
<td>6-8 months</td>
<td>190-388 mg/dL</td>
</tr>
<tr>
<td>9-23 months</td>
<td>288-880 mg/dL</td>
</tr>
<tr>
<td>2 years</td>
<td>170-950 mg/dL</td>
</tr>
<tr>
<td>3-4 years</td>
<td>290-1065 mg/dL</td>
</tr>
<tr>
<td>9-10 years</td>
<td>390-1235 mg/dL</td>
</tr>
<tr>
<td>11-12 years</td>
<td>380-1420 mg/dL</td>
</tr>
<tr>
<td>13-14 years</td>
<td>380-1420 mg/dL</td>
</tr>
<tr>
<td>15 years and older</td>
<td>240-1118 mg/dL</td>
</tr>
</tbody>
</table>

### Immunoglobulin G Subclass 3

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Range in mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-4 years</td>
<td>290-1065 mg/dL</td>
</tr>
<tr>
<td>9-23 months</td>
<td>288-880 mg/dL</td>
</tr>
<tr>
<td>6-8 months</td>
<td>23-147 mg/dL</td>
</tr>
<tr>
<td>2 years</td>
<td>170-950 mg/dL</td>
</tr>
<tr>
<td>3-5 months</td>
<td>143-453 mg/dL</td>
</tr>
<tr>
<td>0-2 months</td>
<td>40-167 mg/dL</td>
</tr>
<tr>
<td>9-10 years</td>
<td>57-345 mg/dL</td>
</tr>
<tr>
<td>11-12 years</td>
<td>37-60 mg/dL</td>
</tr>
<tr>
<td>13-14 years</td>
<td>61-430 mg/dL</td>
</tr>
<tr>
<td>15 years and older</td>
<td>240-1118 mg/dL</td>
</tr>
</tbody>
</table>

### Immunoglobulin G Subclass 4

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Range in mg/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>9-23 months</td>
<td>30-327 mg/dL</td>
</tr>
<tr>
<td>6-8 months</td>
<td>37-60 mg/dL</td>
</tr>
<tr>
<td>2 years</td>
<td>22-440 mg/dL</td>
</tr>
<tr>
<td>3-5 months</td>
<td>23-147 mg/dL</td>
</tr>
<tr>
<td>7-8 years</td>
<td>39-70 mg/dL</td>
</tr>
<tr>
<td>11-12 years</td>
<td>61-430 mg/dL</td>
</tr>
<tr>
<td>13-14 years</td>
<td>73-455 mg/dL</td>
</tr>
<tr>
<td>15 years and older</td>
<td>240-1118 mg/dL</td>
</tr>
</tbody>
</table>

---

**Interpretive Data:**

The total IgG (mg/dL) can be derived from the sum of the subclass IgG1, IgG2, IgG3, and IgG4 values. However, a confirmatory and more precise total IgG is available by the nephelometric method of quantitation for total IgG. Refer to test Immunoglobulin G, Serum (0050350).

---

**ADMINISTRATIVE**

**CPT Codes:**

82787 x4

**COMPLETE VIEW**

**Available Stat:**

ARUP

**Ordering Recommendations:**

Do not order for total IgG measurements. Secondary test in suspected immunoglobulin deficiency. Do not order before IgG, IgA, and IgM measurements are performed.

**Test Code:**

IGGSUB

**ARUP Test Code:**

0050577

**Sendout:**

Yes

**Performed:**

Mon-Sat

**Methodology:**

Quantitative Nephelometry

**Collect:**

Serum separator tube.

**Specimen Preparation:**
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.45 mL)

**Reference Interval:**

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
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<td>6-8 months: 190-388 mg/dL 11-12 years: 380-1420 mg/dL</td>
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<tr>
<td></td>
<td>9-23 months: 288-880 mg/dL 13-14 years: 165-1440 mg/dL</td>
</tr>
<tr>
<td></td>
<td>2 years: 170-950 mg/dL 15 years and older: 240-1118 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-4 years: 290-1065 mg/dL</td>
</tr>
<tr>
<td>Immunoglobulin</td>
<td>Cord blood: 143-453 mg/dL 5-6 years: 57-345 mg/dL</td>
</tr>
<tr>
<td>G Subclass 2</td>
<td>0-2 months: 40-167 mg/dL 7-8 years: 42-375 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-5 months: 23-147 mg/dL 9-10 years: 61-430 mg/dL</td>
</tr>
<tr>
<td></td>
<td>6-8 months: 37-60 mg/dL 11-12 years: 73-455 mg/dL</td>
</tr>
<tr>
<td></td>
<td>9-23 months: 30-327 mg/dL 13-14 years: 71-460 mg/dL</td>
</tr>
<tr>
<td></td>
<td>2 years: 22-440 mg/dL 15 years and older: 124-549 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-4 years: 28-315 mg/dL</td>
</tr>
<tr>
<td>Immunoglobulin</td>
<td>Cord blood: 27-146 mg/dL 5-6 years: 8-126 mg/dL</td>
</tr>
<tr>
<td>G Subclass 3</td>
<td>0-2 months: 4-23 mg/dL 7-8 years: 9-107 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-5 months: 4-70 mg/dL 9-10 years: 10-98 mg/dL</td>
</tr>
<tr>
<td></td>
<td>6-8 months: 12-62 mg/dL 11-12 years: 16-194 mg/dL</td>
</tr>
<tr>
<td></td>
<td>9-23 months: 13-82 mg/dL 13-14 years: 12-178 mg/dL</td>
</tr>
<tr>
<td></td>
<td>2 years: 4-69 mg/dL 15 years and older: 21-134 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-4 years: 4-71 mg/dL</td>
</tr>
<tr>
<td>Immunoglobulin</td>
<td>Effective February 16, 2016</td>
</tr>
<tr>
<td>G Subclass 4</td>
<td>Cord blood: 1-47 mg/dL 5-6 years: 2-116 mg/dL</td>
</tr>
<tr>
<td></td>
<td>0-2 months: 1-33 mg/dL 7-8 years: 0-138 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-5 months: 1-14 mg/dL 9-10 years: 1-95 mg/dL</td>
</tr>
<tr>
<td></td>
<td>6-8 months: 1-16 mg/dL 11-12 years: 1-153 mg/dL</td>
</tr>
<tr>
<td></td>
<td>9-23 months: 1-65 mg/dL 13-14 years: 2-143 mg/dL</td>
</tr>
<tr>
<td></td>
<td>2 years: 0-120 mg/dL 15 years and older: 1-123 mg/dL</td>
</tr>
<tr>
<td></td>
<td>3-4 years: 0-90 mg/dL</td>
</tr>
</tbody>
</table>

**Interpretive Data:**

The total IgG (mg/dL) can be derived from the sum of the subclass IgG1, IgG2, IgG3, and IgG4 values. However, a confirmatory and more precise total IgG is available by the nephelometric method of quantitation for total IgG. Refer to test Immunoglobulin G, Serum (0050350).

**Synonyms:**
- Gamma-Globulins, Quantitative
- IgG 1, 2, 3, 4
- IgG Subclasses
- Subclasses, IgG

**Storage/Transport Temperature:**
- Refrigerated.

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 2 hours; Refrigerated: 8 days; Frozen: 6 months

**Reported:**
- 1-3 days

**CPT Codes:**
- 82787 x4
Infliximab or Biosimilar Activity and Neutralizing Antibody
IFXAN

ORDERING

Ordering Recommendations:
Evaluate response failure to infliximab or biosimilar therapy. Determine and adjust dosage or identify the need for change to another anti-TNF-alpha inhibitor.

Performing Lab:
ARUP

Performed:
Mon, Wed, Thu, Sat

Methodology:
Cell Culture/Quantitative Chemiluminescent Immunoassay/ Semi-Quantitative Chemiluminescent Immunoassay

Reported:
2-3 days

Synonyms:
- Anti-TNF-alpha Drug
- Human Anti-Chimeric Antibody
- IFD
- Infliximab level
- Infliximab/HACA measurement
- Remicade
- TNFa antibody

COLLECTION

Patient Preparation:
Collect specimens before infliximab or biosimilar treatment.

Collect:
Serum separator tube.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Contaminated, hemolyzed, icteric, or lipemic specimens.

PROCESSING

Test Code:
IFXAN

ARUP Test Code:
2008320

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:
Contaminated, hemolyzed, icteric, or lipemic specimens.

**Stability (from collection to initiation):**
- After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
- Refrigerated.

### RESULT INTERPRETATION

**Reference Interval:**

<table>
<thead>
<tr>
<th>Available Separately</th>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Infliximab Activity</td>
<td>Not Detected</td>
</tr>
<tr>
<td>No</td>
<td>Infliximab Neutralizing Antibody Titer</td>
<td>Not Detected</td>
</tr>
</tbody>
</table>

**Interpretive Data:**

This test measures the capacity of infliximab to neutralize TNF-alpha activity. Additionally, infliximab neutralizing antibodies (NAb) are titered (reporting the minimal serum dilution at which blocking of infliximab activity is no longer observed).

This test is used to evaluate secondary response failures to infliximab therapy. Secondary response failure is defined as loss of clinical response after initial improvement of clinical signs and symptoms. Therapeutic decision should rest on both the clinical response and the knowledge of the fate of the drug including the emergence of immunogenicity in individual patients.

Circulating infliximab levels have been shown to vary considerably between patients. These differences relate to route and frequency of administration and patient-related features such as age, gender, weight, drug metabolism, and concomitant medications such as methotrexate and other immunosuppressants.

<table>
<thead>
<tr>
<th>IF Infliximab Activity is...</th>
<th>AND Infliximab Neutralizing Ab. Titer is...</th>
<th>THEN....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Detected</td>
<td>Not Detected</td>
<td>A higher dosage of infliximab or shortening the dosing interval may be appropriate.</td>
</tr>
<tr>
<td>Not Detected</td>
<td>1:20 or greater</td>
<td>A change to another anti-TNF-alpha drug may be appropriate.</td>
</tr>
<tr>
<td>0.65 ug/mL or greater</td>
<td>Not Detected</td>
<td>A change to another type of therapy (not targeting TNF-alpha) may be appropriate.</td>
</tr>
<tr>
<td>0.65 ug/mL or greater</td>
<td>1:20 or greater</td>
<td>Repeat testing is suggested to rule out decreasing infliximab activity and/or increasing infliximab neutralizing antibodies.</td>
</tr>
</tbody>
</table>

### ADMINISTRATIVE

**CPT Codes:**
- 80299; 82397

### COMPLETE VIEW

**Ordering Recommendations:**
Evaluate response failure to infliximab or biosimilar therapy. Determine and adjust dosage or identify the need for change to another anti-TNF-alpha inhibitor.

**Test Code:**
- IFXAN

**ARUP Test Code:**
- 2008320

**Performing Lab:**
- ARUP

**Sendout:**
- Yes

**Performed:**
- Mon, Wed, Thu, Sat

**Methodology:**
- [Printed 06/07/19]
- Test information subject to change
Cell Culture/Quantitative Chemiluminescent Immunoassay/ Semi-Quantitative Chemiluminescent Immunoassay

**Patient Preparation:**
Collect specimens before infliximab or biosimilar treatment.

**Collect:**
Serum separator tube.

**Unacceptable Conditions:**
Contaminated, hemolyzed, icteric, or lipemic specimens.

**Specimen Preparation:**
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.5 mL)

**Reference Interval:**

<table>
<thead>
<tr>
<th>Available Separately</th>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Infliximab Activity</td>
<td>Not Detected</td>
</tr>
<tr>
<td>No</td>
<td>Infliximab Neutralizing Antibody Titer</td>
<td>Not Detected</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
This test measures the capacity of infliximab to neutralize TNF-alpha activity. Additionally, infliximab neutralizing antibodies (NAb) are titered (reporting the minimal serum dilution at which blocking of infliximab activity is no longer observed).

This test is used to evaluate secondary response failures to infliximab therapy. Secondary response failure is defined as loss of clinical response after initial improvement of clinical signs and symptoms. Therapeutic decision should rest on both the clinical response and the knowledge of the fate of the drug including the emergence of immunogenicity in individual patients.

Circulating infliximab levels have been shown to vary considerably between patients. These differences relate to route and frequency of administration and patient-related features such as age, gender, weight, drug metabolism, and concomitant medications such as methotrexate and other immunosuppressants.

<table>
<thead>
<tr>
<th>IF Infliximab Activity Is....</th>
<th>AND Infliximab Neutralizing Ab. Titer is....</th>
<th>THEN....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Detected</td>
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<td>A higher dosage of infliximab or shortening the dosing interval may be appropriate.</td>
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<tr>
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<td>0.65 ug/mL or greater</td>
<td>Not Detected</td>
<td>A change to another type of therapy (not targeting TNF-alpha) may be appropriate.</td>
</tr>
<tr>
<td>0.65 ug/mL or greater</td>
<td>1:20 or greater</td>
<td>Repeat testing is suggested to rule out decreasing infliximab activity and/or increasing infliximab neutralizing antibodies.</td>
</tr>
</tbody>
</table>

**Synonyms:**
- Anti-TNF-alpha Drug
- Human Anti-Chimeric Antibody
- IFD
- Infliximab level
- Infliximab/HACA measurement
- Remicade
- TNFα antibody

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 4 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Reported:**
2-3 days

**CPT Codes:**
80299; 82397

**Notes:**
This test is performed pursuant to an agreement with Euro Diagnostica.
Influenza A virus antibody
FLUA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Complement fixation
Reported:
Performed 5x per week. Turnaround 3-5 days
Additional Information:
Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.

Single titers of >= 1:64 indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.

See also entry for Viral Serology and Respiratory Virus DFA
Synonyms:
• flu A

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month

PROCESSING

Test Code:
FLUA
Test Group:
Influenza
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum. Order Quest #52290P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

**RESULT INTERPRETATION**

**Units:**
- titer

**Reference Interval:**
- Negative titer < 1:8

**Additional Information:**
Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.

Single titers of >= 1:64 indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.

See also entry for Viral Serology and Respiratory Virus DFA

**ADMINISTRATIVE**

**CPT Codes:**
- 86710-90

**LOINC Codes:**
- 5229-0

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- FLUA

**Test Group:**
- Influenza

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Complement fixation

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Specimen Preparation:**
- Refrigerate serum. Order Quest #52290P

**Units:**
- titer

**Reference Interval:**
Negative titer < 1:8

Synonyms:
- flu A

Stability (from collection to initiation):
  - Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month

Reported:
  - Performed 5x per week. Turnaround 3-5 days

Additional Information:
  - Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.
  - Single titers of $\geq 1:64$ indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.
  - See also entry for Viral Serology and Respiratory Virus DFA

CPT Codes:
- 86710-90

LOINC Codes:
- 5229-0
Influenza B antibody
FLUB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Complement fixation
Reported:
Performed 5x per week. Turnaround 3-5 days
Additional Information:
Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.

Single titers of ≥ 1:64 indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis. See also entry for Viral Serology and Respiratory Virus DFA

Synonyms:
• Flu B

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

PROCESSING

Test Code:
FLUB
Test Group:
Influenza
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum at 4C. Order Quest test #52308P
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
titer
Reference Interval:
Negative titer < 1:8
Additional Information:
Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.

Single titers of >= 1:64 indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis. See also entry for Viral Serology and Respiratory Virus DFA

ADMINISTRATIVE

CPT Codes:
86710-90
LOINC Codes:
5230-8

COMPLETE VIEW

Available Stat:
No
Test Code:
FLUB
Test Group:
Influenza
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Complement fixation
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Specimen Preparation:
Refrigerate serum at 4C. Order Quest test #52308P
Units:
titer
Reference Interval:
Negative titer < 1:8
Synonyms:
Flu B

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:
Performed 5x per week. Turnaround 3-5 days

Additional Information:
Influenza Type A and B viruses cause seasonal outbreaks of "the flu". Each winter, approximately 10-20% of the population are infected. Both Type A and B are included in the flu vaccine.

Single titers of >= 1:64 indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months. A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis. See also entry for Viral Serology and Respiratory Virus DFA

CPT Codes:
86710-90

LOINC Codes:
5230-8
Inhibin A

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Enzyme immunoassay
Reported: 3-5 days

Additional Information:
Inhibin A is useful as an indicator of gonadal function, and ovarian response to hMG or to FSH stimulation. Inhibin A, produced by the placenta, is used along with other maternal serum biochemical markers to improve sensitivity of the screen for Down syndrome risk.

COLLECTION

Sample Type: Serum
Collect: Red top, Gold top
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL serum
Minimum Volume: 0.5 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen 4 weeks.

PROCESSING

Test Code: INHNA
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Liquid and freeze sample. Ship to CB frozen.
Preferred Volume: 2 mL serum
Minimum Volume: 0.5 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen 4 weeks.

RESULT INTERPRETATION

Units: pg/mL
Additional Information:
Inhibin A is useful as an indicator of gonadal function, and ovarian response to hMg or to FSH stimulation. Inhibin A, produced by the placenta, is used along with other maternal serum biochemical markers to improve sensitivity of the screen for Down syndrome risk.

CPT Codes:
86336-90

Available Stat:
No

Test Code:
INHNA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Enzyme immunoassay

Collect:
Red top, Gold top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Liquid and freeze sample. Ship to CB frozen.

Units:
pg/mL

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen 4 weeks.

Reported:
3-5 days

Additional Information:
Inhibin A is useful as an indicator of gonadal function, and ovarian response to hMg or to FSH stimulation. Inhibin A, produced by the placenta, is used along with other maternal serum biochemical markers to improve sensitivity of the screen for Down syndrome risk.

CPT Codes:
86336-90
Inhibin B
INHNB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
5-7 days
Additional Information:
Inhibin B is the major circulating inhibin in males. It is also detectable in women during menstrual cycles, particularly prior to ovulation. The measurement of inhibin B serves as an endocrine marker for monitoring male and female gonadal function.

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen 4 weeks

PROCESSING

Test Code:
INHNB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen 4 weeks

RESULT INTERPRETATION

Additional Information:
Inhibin B is the major circulating inhibin in males. It is also detectable in women during menstrual cycles, particularly prior to ovulation. The measurement of inhibin B serves as an endocrine marker for monitoring male and female gonadal function.
**ADMINISTRATIVE**

CPT Codes:
82397-90

**COMPLETE VIEW**

Available Stat:
No

Test Code:
INHNB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoassay

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze serum

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen 4 weeks

Reported:
5-7 days

Additional Information:
Inhibin B is the major circulating inhibin in males. It is also detectable in women during menstrual cycles, particularly prior to ovulation. The measurement of inhibin B serves as an endocrine marker for monitoring male and female gonadal function.

CPT Codes:
82397-90

Test information subject to change
Inhibitor Screen for Partial Thromboplastin Time
PTTIS

ORDERING

Approval Required:
No. However, the PTT Inhibitor Screen will be performed only if the PTT is abnormal.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Monday-Friday 0800-1400

Reported:
Same day or next weekday

Additional Information:
PTT Inhibitor Screen will be performed only if the PTT is abnormal. If the test is ordered on a sample with a normal PTT, the inhibitor screen cannot yield a positive result. "Test not Indicated" will be sent.

The PTT Inhibitor Screen should be used for screening for a Factor 9 specific inhibitor.

The PTT Inhibitor Screen may be of limited value in a number of clinical settings and alternative tests are recommended:

For the evaluation of lupus anticoagulant as cause of a prolonged PTT, specific tests are suggested [Russell's Viper Venom Test (RVVTM) and Lupus anticoagulant by Hexa (HEXA)].

For the evaluation of thrombin inhibitors as cause of a prolonged PTT, a Thrombin Time may be useful.

Screening for Factor 8 or Factor 11 inhibitors, the Modified Inhibitor Titer (MODIT) is suggested.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- PTT Mixing Study, Inhibitor Screen, Factor Inhibitor Screen

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum X 3

Amount to Collect:
9 ml blood

Preferred Volume:
4 mL plasma

Minimum Volume:
2 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
4 hours

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code: PTTIS
Test Group: Inhibitor screen
Performing Lab: Parnassus Hematology
Specimen Preparation: Deliver sample to the Hematology Lab ASAP.
Preferred Volume: 4 mL plasma
Minimum Volume: 2 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.
Stability (from collection to initiation): 4 hours

RESULT INTERPRETATION

Reference Interval: Negative
Additional Information:
PTT Inhibitor Screen will be performed only if the PTT is abnormal. If the test is ordered on a sample with a normal PTT, the inhibitor screen cannot yield a positive result. "Test not Indicated" will be sent.

The PTT Inhibitor Screen should be used for screening for a Factor 9 specific inhibitor.

The PTT Inhibitor Screen may be of limited value in a number of clinical settings and alternative tests are recommended:

For the evaluation of lupus anticoagulant as cause of a prolonged PTT, specific tests are suggested [Russell's Viper Venom Test (RVVTM) and Lupus anticoagulant by Hexa (HEXA)].

For the evaluation of thrombin inhibitors as cause of a prolonged PTT, a Thrombin Time may be useful.

Screening for Factor 8 or Factor 11 inhibitors, the Modified Inhibitor Titer (MODIT) is suggested.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85730, 85732 x2
LDT or Modified FDA:
Yes

COMPLETE VIEW

Approval Required:
No. However, the PTT Inhibitor Screen will be performed only if the PTT is abnormal.
Available Stat:
No
Test Code: PTTIS
Test Group: Inhibitor screen
Performing Lab: Parnassus Hematology
Performed: Monday-Friday 0800-1400
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect: Blue top filled to full extent of vacuum X 3
Amount to Collect: 9 ml blood
Sample Type: Citrated plasma
Preferred Volume: 4 mL plasma
Minimum Volume: 2 mL plasma
Unacceptable Conditions: Samples collected in outdated blue top vacutainer.
Specimen Preparation: Deliver sample to the Hematology Lab ASAP.
Reference Interval: Negative
Synonyms:
- PTT Mixing Study, Inhibitor Screen, Factor Inhibitor Screen
Stability (from collection to initiation): 4 hours
Reported: Same day or next weekday
Additional Information:
PTT Inhibitor Screen will be performed only if the PTT is abnormal. If the test is ordered on a sample with a normal PTT, the inhibitor screen cannot yield a positive result. "Test not Indicated" will be sent.

The PTT Inhibitor Screen should be used for screening for a Factor 9 specific inhibitor.

The PTT Inhibitor Screen may be of limited value in a number of clinical settings and alternative tests are recommended:

For the evaluation of lupus anticoagulant as cause of a prolonged PTT, specific tests are suggested [Russell's Viper Venom Test (RVVTM) and Lupus anticoagulant by Hexa (HEXA)].

For the evaluation of thrombin inhibitors as cause of a prolonged PTT, a Thrombin Time may be useful.

Screening for Factor 8 or Factor 11 inhibitors, the Modified Inhibitor Titer (MODIT) is suggested.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes: 85730, 85732 x2
LDT or Modified FDA:
Yes
Inhibitor Screen for Prothrombin Time
PTIS

ORDERING

Approval Required:
No. However, the PT Inhibitor Screen will be performed only if the PT is abnormal.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Monday-Friday 0800-1400

Reported:
Same day or next weekday

Additional Information:
PT Inhibitor Screen will be performed only if the Prothrombin Time (PT) is abnormal. If the test is ordered on a sample with a normal Prothrombin Time, the inhibitor screen cannot yield a positive result. “Test not Indicated” will be sent.

PT inhibitors are unusual. If clinically indicated, obtaining fibrinogen, as well as factor activity assays for factors 2, 5, 7, and 10 may be considered even without performing the PT Inhibitor Screen.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- PT Mixing Study, Inhibitor Screen, Factor Inhibitor Screen

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum X 2

Amount to Collect:
6 ml blood

Preferred Volume:
3 mL plasma

Minimum Volume:
2 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
4 hours

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code:
PTIS
Test Group:
Inhibitor screen
Performing Lab:
Parnassus Hematology
Specimen Preparation:
Deliver sample to the Hematology Lab ASAP.
Preferred Volume:
3 mL plasma
Minimum Volume:
2 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.
Stability (from collection to initiation):
4 hours

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
PT Inhibitor Screen will be performed only if the Prothrombin Time (PT) is abnormal. If the test is ordered on a sample with a normal Prothrombin Time, the inhibitor screen cannot yield a positive result. “Test not Indicated” will be sent.

PT inhibitors are unusual. If clinically indicated, obtaining fibrinogen, as well as factor activity assays for factors 2, 5, 7, and 10 may be considered even without performing the PT Inhibitor Screen.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85610, 85611 x2
LDT or Modified FDA:
Yes

COMPLETE VIEW

Approval Required:
No. However, the PT Inhibitor Screen will be performed only if the PT is abnormal.
Available Stat:
No
Test Code:
PTIS
Test Group:
Inhibitor screen
Performing Lab:
Parnassus Hematology
Performed:
Monday-Friday 0800-1400
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct’s >= 55% please contact Hematology (Parnassus: 3-1747, Mission Bay 6-1094) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
- Blue top filled to full extent of vacuum X 2

Amount to Collect:
- 6 ml blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 3 mL plasma

Minimum Volume:
- 2 mL plasma

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer.

Specimen Preparation:
- Deliver sample to the Hematology Lab ASAP.

Reference Interval:
- Negative

Synonyms:
- PT Mixing Study, Inhibitor Screen, Factor Inhibitor Screen

Stability (from collection to initiation):
- 4 hours

Reported:
- Same day or next weekday

Additional Information:
- PT Inhibitor Screen will be performed only if the Prothrombin Time (PT) is abnormal. If the test is ordered on a sample with a normal Prothrombin Time, the inhibitor screen cannot yield a positive result. “Test not Indicated” will be sent.

- PT inhibitors are unusual. If clinically indicated, obtaining fibrinogen, as well as factor activity assays for factors 2, 5, 7, and 10 may be considered even without performing the PT Inhibitor Screen.

- If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
- 85610, 85611 x2

LDT or Modified FDA:
- Yes
Insect Venom IgG Antibody
MOLT

ORDERING
Available Stat: No
Performing Lab: Quest
Methodology: RAST
Additional Information: Assays are available for antibody to venoms from Honey bee (NI# 67272N), Paper wasp (NI# 67314N), White-faced hornet (NI# 74179N), Yellow hornet (NI# 67397N) and Yellow jacket (NI# 77685N). These assays are not approved by FDA for clinical use.

COLLECTION
Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood for each venom to be tested
Preferred Volume: 1 mL serum for each venom to be tested
Minimum Volume: 0.3 mL serum for each venom
Remarks: Indicate insect type suspected if known on requisition (Honey bee, Paper wasp, White-faced hornet, Yellow hornet, Yellow jacket)

PROCESSING
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest # specified for insect thought to be the source of risk; if the provocative insect is unknown, order all of the assays.
Preferred Volume: 1 mL serum for each venom to be tested
Minimum Volume: 0.3 mL serum for each venom

RESULT INTERPRETATION
Reference Interval: Interpretation:
< 1.0-3.4 mg/L: Low level of IgG antibody indicating a significant risk of reaction in patients with a history of systemic anaphylaxis from hymenoptera sting and/or positive skin test to venom.
>= 3.5 mg/L: Moderate level of IgG antibody to venom associated with a reduced risk, depending on history.
**Additional Information:**
Assays are available for antibody to venoms from Honey bee (NI# 67272N), Paper wasp (NI# 67314N), White-faced hornet (NI# 74179N), Yellow hornet (NI# 67397N) and Yellow jacket (NI# 77685N). These assays are not approved by FDA for clinical use.

**ADMINISTRATIVE**

**CPT Codes:**
83520-90 for each venom tested

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
RAST

**Remarks:**
Indicate insect type suspected if known on requisition (Honey bee, Paper wasp, White-faced hornet, Yellow hornet, Yellow jacket)

**Collect:**
Gold top

**Amount to Collect:**
2 mL blood for each venom to be tested

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum for each venom to be tested

**Minimum Volume:**
0.3 mL serum for each venom

**Specimen Preparation:**
Refrigerate. Order Quest # specified for insect thought to be the source of risk; if the provocative insect is unknown, order all of the assays.

**Reference Interval:**
Interpretation:

< 1.0-3.4 mg/L: Low level of IgG antibody indicating a significant risk of reaction in patients with a history of systemic anaphylaxis from hymenoptera sting and/or positive skin test to venom.

>= 3.5 mg/L: Moderate level of IgG antibody to venom associated with a reduced risk, depending on history.

**Additional Information:**
Assays are available for antibody to venoms from Honey bee (NI# 67272N), Paper wasp (NI# 67314N), White-faced hornet (NI# 74179N), Yellow hornet (NI# 67397N) and Yellow jacket (NI# 77685N). These assays are not approved by FDA for clinical use.

**CPT Codes:**
83520-90 for each venom tested
Insulin
INS

ORDERING

Available Stat:  
No
Performing Lab:  
China Basin Chemistry
Performed:  
Wednesdays (day shift)
Methodology:  
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported:  
3-10 days.
Additional Information:  
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017.

The Architect Insulin calibrators are referenced to the World Health Organization (WHO) Insulin 1st International Reference Preparation, 66/304.

No changes were made to the reference range.

<table>
<thead>
<tr>
<th>Table 1. Comparison of commercial insulin assays</th>
</tr>
</thead>
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<table>
<thead>
<tr>
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<th>Roche Elecsys/E170</th>
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<th>Access</th>
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N/A: not available


Synonyms:  
- Insulin

COLLECTION

Patient Preparation:  
An overnight fast is required prior to specimen collection or reference ranges will not apply.
Sample Type:  
Serum
Collect:  
Gold top or Red top
Amount to Collect:  
2 mL blood
Preferred Volume:  
1 mL serum
Minimum Volume:
0.15 mL serum

**Stability (from collection to initiation):**
Stable for 30 days when frozen at -20°C or colder.

---

**PROCESSING**

**Test Code:**
INS

**Performing Lab:**
China Basin Chemistry

**Specimen Preparation:**
Centrifuge promptly. Freeze serum at -20°C.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.15 mL serum

**Stability (from collection to initiation):**
Stable for 30 days when frozen at -20°C or colder.

---

**RESULT INTERPRETATION**

**Units:**
mU/L

**Reference Interval:**
Fasting: 3.0 - 19.0 mU/L

Reference range was adopted from ARUP Laboratory based on correlation studies.

Note: if patient was not fasting, the normal ranges may not apply.

**Additional Information:**
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017.

The Architect Insulin calibrators are referenced to the World Health Organization (WHO) Insulin 1st International Reference Preparation, 66/304.

No changes were made to the reference range.

**Table 1. Comparison of commercial insulin assays**

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<tr>
<th></th>
<th>Roche Elexys/E170</th>
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<td>(Roche Diagnostics, Indianapolis, Indiana)</td>
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<td>Glulisine</td>
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<td>Detemir</td>
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<td>Glargine</td>
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**Source:** J Clin Res Pediatr Endocrinol 2014;6(4):258-261
**CPT Codes:**
83525

**LOINC Codes:**
20448-7

---

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
INS

**Performing Lab:**
China Basin Chemistry

**Performed:**
Wednesdays (day shift)

**Methodology:**
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

**Patient Preparation:**
An overnight fast is required prior to specimen collection or reference ranges will not apply.

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.15 mL serum

**Specimen Preparation:**
Centrifuge promptly. Freeze serum at -20°C.

**Units:**
mU/L

**Reference Interval:**
Fasting: 3.0 - 19.0 mU/L

Reference range was adopted from ARUP Laboratory based on correlation studies.

Note: if patient was not fasting, the normal ranges may not apply.

**Synonyms:**
- Insulin

**Stability (from collection to initiation):**
Stable for 30 days when frozen at -20°C or colder.

**Reported:**
3-10 days.

**Additional Information:**
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017.

The Architect Insulin calibrators are referenced to the World Health Organization (WHO) Insulin 1st International Reference Preparation, 66/304.

No changes were made to the reference range.

**CPT Codes:**

83525

**LOINC Codes:**

20448-7
**Insulin Autoantibody**

**INHS**

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Radio Binding Assay

**Reported:**
- Test performed Wednesday. Turnaround 3-10 days

**Synonyms:**
- Anti-insulin antibody

**COLLECTION**

**Sample Type:**
- Serum

**Collect:**
- Red top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Stability (from collection to initiation):**
- Room temperature 4 weeks, refrigerated 4 weeks, frozen at -20°C 4 weeks.

**PROCESSING**

**Test Code:**
- INHS

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Order Quest # 52324P

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Stability (from collection to initiation):**
- Room temperature 4 weeks, refrigerated 4 weeks, frozen at -20°C 4 weeks.

**RESULT INTERPRETATION**

**Units:**
- U/mL

**Reference Interval:**

Printed 06/07/19

Test information subject to change
<0.4 U/mL

**Administrative**

- **CPT Codes:**
  - 86337-90
- **LOINC Codes:**
  - 13633-3

**Complete View**

- **Available Stat:**
  - No
- **Test Code:**
  - INHS
- **Performing Lab:**
  - Quest
- **Sendout:**
  - Yes
- **Methodology:**
  - Radio Binding Assay
- **Collect:**
  - Red top
- **Amount to Collect:**
  - 2 mL blood
- **Sample Type:**
  - Serum
- **Preferred Volume:**
  - 1 mL serum
- **Minimum Volume:**
  - 0.2 mL serum
- **Specimen Preparation:**
  - Order Quest # 52324P
- **Units:**
  - U/mL
- **Reference Interval:**
  - <0.4 U/mL
- **Synonyms:**
  - Anti-insulin antibody
- **Stability (from collection to initiation):**
  - Room temperature 4 weeks, refrigerated 4 weeks, frozen at -20C 4 weeks.
- **Reported:**
  - Test performed Wednesday. Turnaround 3-10 days
- **CPT Codes:**
  - 86337-90
- **LOINC Codes:**
  - 13633-3
Insulin, C-peptide
CPEP

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Wednesday (day shift)
Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported:
1-7 days
Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017. Please note that the reference ranges have changed.

The Architect C-Peptide Calibrators are established against a set of Internal Reference Calibrators, which are traceable to the WHO International Reference Reagent for C-Peptide of human insulin for immunoassay, code 84/510, established 1986, from the National Institute for Biological Standards and Control (NIBSC).

The specificity of the ARCHITECT C-peptide assay is designed to have <= 0.01% cross-reactivity when tested with compounds listed in the table below. For proinsulin the assay is designed to have <= 40% cross-reactivity.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration (ng/mL)</th>
<th>Cross-reactivity (%)</th>
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<tbody>
<tr>
<td>Human Insulin</td>
<td>8660</td>
<td>0</td>
</tr>
<tr>
<td>Glucagon</td>
<td>10000</td>
<td>0</td>
</tr>
<tr>
<td>Human Proinsulin</td>
<td>100</td>
<td>12.8</td>
</tr>
<tr>
<td>Secretin</td>
<td>15000</td>
<td>0</td>
</tr>
<tr>
<td>Somatomedin-C (IFG-T)</td>
<td>1000</td>
<td>0</td>
</tr>
</tbody>
</table>

Synonyms:
- C-peptide

COLLECTION

Patient Preparation:
Overnight fast is required before specimen collection.
Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.15 mL serum
Remarks:
Deliver to lab immediately. Call physician if patient is not fasting to see if the specimen is acceptable.
Stability (from collection to initiation):
Room temperature: Stable for 24 hours
Refrigerated (2-8°C): Stable for 48 hours
Frozen at -20°C or colder: Stable for 3 months

Test information subject to change

Printed 06/07/19
Avoid more than 3 freeze/thaw cycles.

**PROCESSING**

**Test Code:**
- CPEP

**Performing Lab:**
- China Basin Chemistry

**Specimen Preparation:**
- Centrifuge promptly. Freeze serum at -20°C.

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.15 mL serum

**Stability (from collection to initiation):**
- Room temperature: Stable for 24 hours
- Refrigerated (2-8°C): Stable for 48 hours
- Frozen at -20°C or colder: Stable for 3 months

Avoid more than 3 freeze/thaw cycles.

**RESULT INTERPRETATION**

**Units:**
- ng/mL

**Reference Interval:**
- Fasting: 0.8-3.5 ng/mL

Reference range was adopted from ARUP and verified in-house using sample collected by 25 fasting lab donors.

Note: If patient was not fasting, the normal ranges may not apply.

**Additional Information:**
- Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017. Please note that the reference ranges have changed.

The Architect C-Peptide Calibrators are established against a set of Internal Reference Calibrators, which are traceable to the WHO International Reference Reagent for C-Peptide of human insulin for immunoassay, code 84/510, established 1986, from the National Institute for Biological Standards and Control (NIBSC).

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<tr>
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<td>15000</td>
<td>0</td>
</tr>
<tr>
<td>Somatomedin-C (IFG-1)</td>
<td>1000</td>
<td>0</td>
</tr>
</tbody>
</table>

**ADMINISTRATIVE**

**CPT Codes:**
- 84681

**LOINC Codes:**
- 1986-9
Available Stat: No
Test Code: CPEP
Performing Lab: China Basin Chemistry
Performed: Wednesday (day shift)
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Patient Preparation: Overnight fast is required before specimen collection.
Remarks: Deliver to lab immediately. Call physician if patient is not fasting to see if the specimen is acceptable.
Collect: Gold top or Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.15 mL serum
Specimen Preparation: Centrifuge promptly. Freeze serum at -20°C.
Units: ng/mL
Reference Interval:
Fasting: 0.8-3.5 ng/mL
Reference range was adopted from ARUP and verified in-house using sample collected by 25 fasting lab donors.

Note: If patient was not fasting, the normal ranges may not apply.

Synonyms:
• C-peptide

Stability (from collection to initiation):
Room temperature: Stable for 24 hours
Refrigerated (2-8°C): Stable for 48 hours
Frozen at -20°C or colder: Stable for 3 months

Avoid more than 3 freeze/thaw cycles.

Reported: 1-7 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 9/14/2017. Please note that the reference ranges have changed.

The Architect C-Peptide Calibrators are established against a set of Internal Reference Calibrators, which are traceable to the WHO International Reference Reagent for C-Peptide of human insulin for immunoassay, code 84/510, established 1986, from the National Institute for Biological Standards and Control (NIBSC).

The specificity of the ARCHITECT C-peptide assay is designed to have <= 0.01% cross-reactivity when tested with compounds listed in the table below. For proinsulin the assay is designed to have <= 40% cross-reactivity.
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<td>0</td>
</tr>
</tbody>
</table>

CPT Codes:  
84681  

LOINC Codes:  
1986-9
Interleukin 2 Receptor (CD25), Soluble
I2RS

ORDERING

Ordering Recommendations:
Primarily for research and to support attempts to understand the pathogenesis of immune, infectious, allergic, or inflammatory disorders.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Multiplex Bead Assay

Reported:
1-4 days

Synonyms:
- CD25
- cytokines
- IL-2 Receptor
- IL2R
- Interleukin 2 Receptor

COLLECTION

Collect:
Serum separator tube, plain red, or green (lithium heparin).

Stability (from collection to initiation):
After separation from cells: Ambient: 30 minutes; Refrigerated: Unacceptable; Frozen: 1 year

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Refrigerated specimens. Contaminated or heat-inactivated specimens.

PROCESSING

Test Code:
I2RS

ARUP Test Code:
0051529

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum or plasma from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Unacceptable Conditions:
Refrigerated specimens. Contaminated or heat-inactivated specimens.

Stability (from collection to initiation):
After separation from cells: Ambient: 30 minutes; Refrigerated: Unacceptable; Frozen: 1 year

Printed 06/07/19
Test information subject to change
Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:
Effective May 19, 2014
1033 pg/mL or less

Interpretive Data:
Results are used to understand the pathophysiology of immune, infectious, or inflammatory disorders, or may be used for research purposes.

ADMINISTRATIVE

CPT Codes:
83520

COMPLETE VIEW

Ordering Recommendations:
Primarily for research and to support attempts to understand the pathogenesis of immune, infectious, allergic, or inflammatory disorders.

Test Code:
I2RS

ARUP Test Code:
0051529

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Multiplex Bead Assay

Collect:
Serum separator tube, plain red, or green (lithium heparin).

Unacceptable Conditions:
Refrigerated specimens. Contaminated or heat-inactivated specimens.

Specimen Preparation:
Separate serum or plasma from cells ASAP or within 2 hours of collection. Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Reference Interval:
Effective May 19, 2014
1033 pg/mL or less

Interpretive Data:
Results are used to understand the pathophysiology of immune, infectious, or inflammatory disorders, or may be used for research purposes.

Synonyms:
- CD25
- cytokine
- cytokines
- IL 2 Receptor
- IL-2R
- IL2R
- Interleukin 2 Receptor

**Storage/Transport Temperature:**
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 30 minutes; Refrigerated: Unacceptable; Frozen: 1 year

**Reported:**
1-4 days

**CPT Codes:**
83520

**Notes:**
Lower limit of detection is 5 pg/mL. Cytokine levels may demonstrate diurnal variation. For longitudinal comparison, it is recommended that cytokine levels be determined at the same time of day.
<table>
<thead>
<tr>
<th><strong>Interleukin-6</strong></th>
<th><strong>IL6</strong></th>
</tr>
</thead>
</table>

### ORDERING

- **Available Stat:** No
- **Performing Lab:** Quest
- **Methodology:** EIA
- **Reported:** Run Friday. Turnaround time 1-7 days
- **Synonyms:**
  - IL-6
  - IL6

### COLLECTION

- **Sample Type:** Serum
- **Collect:** Gold or Red top
- **Amount to Collect:** 2 mL blood
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.5 mL serum
- **Stability (from collection to initiation):** Room temperature 24 hours, refrigerated 48 hours, frozen at -20°C 3 months. Order Quest test # 34473X

### PROCESSING

- **Test Code:** IL6
- **Sendout:** Yes
- **Performing Lab:** Quest
- **Specimen Preparation:** Separate and freeze serum or plasma at -20°C. Transport frozen.
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.5 mL serum
- **Stability (from collection to initiation):** Room temperature 24 hours, refrigerated 48 hours, frozen at -20°C 3 months. Order Quest test # 34473X

### RESULT INTERPRETATION

- **Units:** pg/mL
Reference Interval:
0.31-5.00 pg/mL

ADMINISTRATIVE

CPT Codes:
83520-90

LOINC Codes:
26881-3

COMPLETE VIEW

Available Stat:
No

Test Code:
IL6

Performing Lab:
Quest

Sendout:
Yes

Methodology:
EIA

Collect:
Gold or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Separate and freeze serum or plasma at -20C. Transport frozen.

Units:
pg/mL

Reference Interval:
0.31-5.00 pg/mL

Synonyms:
- IL-6
- IL6

Stability (from collection to initiation):
Room temperature 24 hours, refrigerated 48 hours, frozen at -20C 3 months. Order Quest test # 34473X

Reported:
Run Friday. Turnaround time 1-7 days

CPT Codes:
83520-90

LOINC Codes:
26881-3
Intracellular Kappa & Lambda Light Chains
ICKL

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday - Friday (Day shift only)
Methodology:
Flow cytometry
Reported:
Preliminary result available from laboratory in 2-4 days. Written interpretive report sent within 7 days.
Additional Information:
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.

COLLECTION

Sample Type:
EDTA whole blood, Bone Marrow, Unfixed tissue, Body Fluid, FNA
Collect:
Lavender top
Amount to Collect:
3 mL blood, Contact Immunology x3-1712 for other sample types
Preferred Volume:
3 mL blood, Contact Immunology x3-1712 for other sample types
Minimum Volume:
Contact Immunology x3-1712
Remarks:
Maintain samples at room temperature and transport to laboratory as soon as possible, esp. for FNA samples
Unacceptable Conditions:
Frozen, fixed samples or those stored at inappropriate temperatures

PROCESSING

Test Code:
ICKL
Performing Lab:
Immunology
Specimen Preparation:
Typically ordered by Immunology only, if order received on a requisition contact Immunology to confirm.
Hold bone marrow specimens at room temperature, but refrigerate fine needle aspirates in special holding medium. Do NOT centrifuge. Each specimen should be assigned its own accession number.
If specimens are delivered after 1200 hours on Friday, weekends or on a holiday contact the resident on call
Preferred Volume:
3 mL blood, Contact Immunology x3-1712 for other sample types
Minimum Volume:
Contact Immunology x3-1712
Unacceptable Conditions:
Frozen, fixed samples or those stored at inappropriate temperatures
RESULT INTERPRETATION

Reference Interval:
Positive

Additional Information:
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
88346 X 2

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
ICKL

Performing Lab:
Immunology

Performed:
Monday - Friday (Day shift only)

Methodology:
Flow cytometry

Remarks:
Maintain samples at room temperature and transport to laboratory as soon as possible, esp. for FNA samples

Collect:
Lavender top

Amount to Collect:
3 mL blood, Contact Immunology x3-1712 for other sample types

Sample Type:
EDTA whole blood, Bone Marrow, Unfixed tissue, Body Fluid, FNA

Preferred Volume:
3 mL blood, Contact Immunology x3-1712 for other sample types

Minimum Volume:
Contact Immunology x3-1712

Unacceptable Conditions:
Frozen, fixed samples or those stored at inappropriate temperatures

Specimen Preparation:
Typically ordered by Immunology only, if order received on a requisition contact Immunology to confirm.

Hold bone marrow specimens at room temperature, but refrigerator fine needle aspirates in special holding medium. Do NOT centrifuge. Each specimen should be assigned its own accession number.

If specimens are delivered after 1200 hours on Friday, weekends or on a holiday contact the resident on call

Reference Interval:
Positive

Reported:
Preliminary result available from laboratory in 2-4 days. Written interpretive report sent within 7 days.

Additional Information:
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.
CPT Codes:
  88346 X 2
LDT or Modified FDA:
  Yes
Intrinsic Factor Blocking Antibody
IFBA

**ORDERING**

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Test performed Tuesday, Thursday, Saturday. Turnaround time: 2-6 days.

**COLLECTION**

Patient Preparation:
Do NOT collect samples within 48 hours following an injection of Vitamin B12, which can give a false positive result.
Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Remarks:
Do NOT collect samples within 48 hours following an injection of Vitamin B12, which can give a false positive result.
Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen at -20C 28 days.

**PROCESSING**

Test Code:
IFBA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum (or plasma). Order Quest # 568
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen at -20C 28 days.

**RESULT INTERPRETATION**

Reference Interval:
ADMINISTRATIVE

CPT Codes:
86340-90

LOINC Codes:
31443-5

COMPLETE VIEW

Available Stat:
No

Test Code:
IFBA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoassay

Patient Preparation:
Do NOT collect samples within 48 hours following an injection of Vitamin B12, which can give a false positive result.

Remarks:
Do NOT collect samples within 48 hours following an injection of Vitamin B12, which can give a false positive result.

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Refrigerate serum (or plasma). Order Quest # 568

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen at -20C 28 days.

Reported:
Test performed Tuesday, Thursday, Saturday. Turnaround time: 2-6 days.

CPT Codes:
86340-90

LOINC Codes:
31443-5
Inversion 3p RPN1/MECOM FISH
INV3Q, BINV3Q

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-Situ Hybridization
Reported: 1-2 weeks
Synonyms:
- Inversion 3q21q26.2 RPN1/MECOM FISH
- INV3Q
- BINV3Q

COLLECTION

Sample Type:
- Heparinized blood or bone marrow aspirate
- Bone biopsy
Collect:
- Blood or marrow aspirate: Dark Green top
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Remarks:
- Mix blood and marrow aspirates well
Stability (from collection to initiation):
- 2 days at room temperature
Unacceptable Conditions:
- Insufficient sample or not collected in heparin

PROCESSING

Test Code:
- BINV3Q: Blood
- INV3Q: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.
Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
?Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
?Bone marrow core: 1 cm

Unacceptable Conditions:
Insufficient sample or not collected in heparin

Stability (from collection to initiation):
2 days at room temperature

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes

Available Stat:
No

Test Code:
BINV3Q: Blood
INV3Q: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Methodology:
Fluorescent in-Situ Hybridization

Remarks:
Mix blood and marrow aspirates well

Collect:
Blood or marrow aspirate: Dark Green top

Amount to Collect:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Sample Type:
Heparinized blood or bone marrow aspirate
Bone biopsy

Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
?Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
?Bone marrow core: 1 cm

Unacceptable Conditions:
Insufficient sample or not collected in heparin

Specimen Preparation:
Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

Synonyms:
• Inversion 3q21q26.2 RPN1/MECOM FISH
• INV3Q
- BINV3Q

**Stability (from collection to initiation):**
2 days at room temperature

**Reported:**
1-2 weeks

**CPT Codes:**
88271 x2, 88275

**LDT or Modified FDA:**
Yes
Inversion, Deletion or Translocation 16q FISH
INV16Q, BINV16

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
- Inv16q, Del16q
- INV16Q
- BINV16

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Dark green top (Na-heparin)
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 2 cm
Remarks:
Maintain sample at room temperature.

PROCESSING

Test Code:
- BINV16: Blood
- INV16Q: Bone marrow
Test Group:
Oncology FISH
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 2 cm

RESULT INTERPRETATION

Reference Interval:
No inversion, deletion or translocation identified

ADMINISTRATIVE

CPT Codes:
- 88271, 88275
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
- BINV16: Blood
- INV16Q: Bone marrow
Test Group:
- Oncology FISH
Performing Lab:
- Medical Genomics - Cytogenetics
Methodology:
- Fluorescent in-situ hybridization (FISH)
Remarks:
- Maintain sample at room temperature.
Collect:
- Dark green top (Na-heparin)
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Sample Type:
- Heparinized whole blood, bone marrow, bone core
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 2 cm
Specimen Preparation:
- Maintain sample at room temperature
Reference Interval:
No inversion, deletion or translocation identified
Synonyms:
- Inv16q, Del16q
- INV16Q
• BINV16

Reported:
1-2 weeks

CPT Codes:
88271, 88275

LDT or Modified FDA:
Yes
Iodine, 24 hour urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)
Reported:
3-5 days
Additional Information:
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

COLLECTION

Sample Type:
Urine
Collect:
24 hour urine collection container without preservative
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

PROCESSING

Test Code:
IODI
Test Group:
Iodine
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Specify the total 24-hour urine volume on the request form. Refrigerate specimen. Forward to CB.
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

RESULT INTERPRETATION
Units:
\( \mu g/24Hr \) (mcg/24 Hr)

Reference Interval:
70-500 \( \mu g/24Hr \)

Additional Information:
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

## ADMINISTRATIVE

CPT Codes:
83789-90

## COMPLETE VIEW

Available Stat:
No

Test Code:
IODI

Test Group:
Iodine

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively Coupled Plasma-Mass Spectrometry (ICP/MS)

Collect:
24 hour urine collection container without preservative

Amount to Collect:
Entire 24 hour urine output

Sample Type:
Urine

Preferred Volume:
10 mL urine

Minimum Volume:
2 mL urine

Specimen Preparation:
Specify the total 24-hour urine volume on the request form. Refrigerate specimen. Forward to CB.

Units:
\( \mu g/24Hr \) (mcg/24 Hr)

Reference Interval:
70-500 \( \mu g/24Hr \)

Stability (from collection to initiation):
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

Reported:
3-5 days

Additional Information:
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

CPT Codes:
83789-90
Iodine, Random Urine
IODUR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively Coupled Plasma/Mass Spectrometry
Reported:
3-5 days
Additional Information:
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL urine
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

PROCESSING

Test Code:
IODUR
Test Group:
Iodine
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do not freeze
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

RESULT INTERPRETATION
Units: 
µg/mL (mcg/mL)

Reference Interval: 
34-523 µg/mL

Additional Information: 
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

ADMINISTRATIVE

CPT Codes: 
83789-90

COMPLETE VIEW

Available Stat: 
No

Test Code: 
IODUR

Test Group: 
Iodine

Performing Lab: 
Quest

Sendout: 
Yes

Methodology: 
Inductively Coupled Plasma/Mass Spectrometry

Collect: 
Urine cup

Amount to Collect: 
10 mL urine

Sample Type: 
Random urine

Preferred Volume: 
10 mL urine

Minimum Volume: 
2 mL urine

Specimen Preparation: 
Do not freeze

Units: 
µg/mL (mcg/mL)

Reference Interval: 
34-523 µg/mL

Stability (from collection to initiation): 
Room temperature 10 days, refrigerated 10 days, frozen unacceptable

Reported: 
3-5 days

Additional Information: 
Iodine is an essential element that is required for thyroid hormone production. The measurement of urinary iodine serves as an index of adequate dietary iodine intake.

CPT Codes: 
83789-90
IRF4 Break Apart Rearrangement FISH
BIRF4, IRF4

ORDERING

Performing Lab:  
Cytogenetics
Performed:  
Mon - Fri 9 am to 5 pm
Methodology:  
FISH
Reported:  
7~14 days
Synonyms:  
- BIRF4
- 6q25 BA Rearrangement FISH
- IRF4

COLLECTION

Sample Type:  
Blood, bone marrow aspirate, bone marrow core
Collect:  
- Blood: Dark Green top Sodium Heparin tube
- Bone marrow: Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.
Amount to Collect:  
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:  
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:  
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Stability (from collection to initiation):  
2 days
Storage/Transport Temperature:  
Room Temperature
Unacceptable Conditions:  
- Clotted samples, samples received refrigerated or frozen

PROCESSING

Test Code:  
- Blood: BIRF4
- Bone marrow: IRF4
Performing Lab:  
Cytogenetics
Preferred Volume:  
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:

- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:

- Clotted samples, samples received refrigerated or frozen

Stability (from collection to initiation):

- 2 days

Storage/Transport Temperature:

- Room Temperature

Administrative

CPT Codes:

- 88271x2, 88275x1

Complete View

Test Code:

- Blood: BIRF4
- Bone marrow: IRF4

Performing Lab:

- Cytogenetics

Performed:

- Mon - Fri 9 am to 5 pm

Methodology:

- FISH

Collect:

- Blood: Dark Green top Sodium Heparin tube
- Bone marrow: Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.

Amount to Collect:

- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:

- Blood, bone marrow aspirate, bone marrow core

Preferred Volume:

- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:

- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:

- Clotted samples, samples received refrigerated or frozen

Synonyms:

- BIRF4
- 6q25 BA Rearrangement FISH
- IRF4

Storage/Transport Temperature:

- Room Temperature

Stability (from collection to initiation):

- 2 days

Reported:

- 7~14 days
CPT Codes:
88271x2, 88275x1
Iron, liver
FEBX

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
ICP/MS
Reported:
14 days
Additional Information:
To convert µg to µmol (SI units) multiply x 0.0179
The hepatic iron index (provided for patients =12 years old) is derived from the formula µg of iron per g of dry liver weight/56 x age. Results between 1.0 and 1.9 suggest mild, nonspecific iron accumulation as may be seen in alcoholic liver disease or heterozygous hemochromatosis. Results > 1.9 indicate homozygous hemochromatosis or transfusion-related iron overload.

COLLECTION

Sample Type:
Fresh liver tissue
Collect:
Trace metal-free vial (blue label)
Amount to Collect:
See preferred volume
Preferred Volume:
0.5 x 5 mm piece of liver
Remarks:
Obtain special vial from Specimen Receiving.

PROCESSING

Test Code:
FEBX
Test Group:
Iron
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Refrigerate specimen. Order MAYO# 8350. Call MCS for pickup.
Preferred Volume:
0.5 x 5 mm piece of liver

RESULT INTERPRETATION

Units:
µg per g dry wt of liver
Reference Interval:
Males: 200-2400 µg per g dry wt of liver
Females: 400-1600 µg per g dry wt of liver

Iron Index: < 1.0

**Additional Information:**

To convert µg to µmol (SI units) multiply x 0.0179

The hepatic iron index (provided for patients ≥12 years old) is derived from the formula µg of iron per g of dry liver weight/56 x age. Results between 1.0 and 1.9 suggest mild, nonspecific iron accumulation as may be seen in alcoholic liver disease or heterozygous hemochromatosis. Results > 1.9 indicate homozygous hemochromatosis or transfusion-related iron overload.

**ADMINISTRATIVE**

**CPT Codes:**
- 83540-90

**LOINC Codes:**
- 57028-3

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- FEBX

**Test Group:**
- Iron

**Performing Lab:**
- Mayo

**Sendout:**
- Yes

**Methodology:**
- ICP/MS

**Remarks:**
- Obtain special vial from Specimen Receiving.

**Collect:**
- Trace metal-free vial (blue label)

**Amount to Collect:**
- See preferred volume

**Sample Type:**
- Fresh liver tissue

**Preferred Volume:**
- 0.5 x 5 mm piece of liver

**Specimen Preparation:**
- Refrigerate specimen. Order MAYO# 8350. Call MCS for pickup.

**Units:**
- µg per g dry wt of liver

**Reference Interval:**
- Males: 200-2400 µg per g dry wt of liver
- Females: 400-1600 µg per g dry wt of liver

- Iron Index: < 1.0

**Reported:**
- 14 days

**Additional Information:**

To convert µg to µmol (SI units) multiply x 0.0179

The hepatic iron index (provided for patients ≥12 years old) is derived from the formula µg of iron per g of dry liver weight/56 x age. Results between 1.0 and 1.9 suggest mild, nonspecific iron accumulation as may be seen in alcoholic liver disease or heterozygous hemochromatosis.
hemochromatosis. Results > 1.9 indicate homozygous hemochromatosis or transfusion-related iron overload.

**CPT Codes:**
83540-90

**LOINC Codes:**
57028-3
Iron, Plasma / Serum

IRON

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric
Reported:
Stat 1 hour, Routine 1 day
Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by x 0.179

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium.

The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum iron, gadolinium containing agents (Gadodiamide, Gadoversetamide, and Gadopentetate) may produce a falsely low result (on average, 75, 78, and 88% respectively, of the actual iron concentration).

See "Calcium" and "Magnesium" entries for respective interferences.


See also Iron, Transferrin and Saturation of Iron-Binding Capacity

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL plasma or serum
Minimum Volume:
0.8 mL plasma or serum
Remarks:
Draw w/o hemolysis, which may artifactually increase the result. To avoid contamination, do not allow the specimen to come into contact with glass.

PROCESSING

Test Code:
IRON
Test Group:
Iron
Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL plasma or serum

Minimum Volume:
0.8 mL plasma or serum

RESULT INTERPRETATION

Units:
µg/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6 days</td>
<td>100 - 250 µg/dL</td>
<td>100 - 250 µg/dL</td>
</tr>
<tr>
<td>7 days - 11 months</td>
<td>40 - 100 µg/dL</td>
<td>40 - 100 µg/dL</td>
</tr>
<tr>
<td>1 - 5 years</td>
<td>22 - 136 µg/dL</td>
<td>22 - 136 µg/dL</td>
</tr>
<tr>
<td>6 - 9 years</td>
<td>39 - 136 µg/dL</td>
<td>39 - 136 µg/dL</td>
</tr>
<tr>
<td>10 - 13 years</td>
<td>28 - 134 µg/dL</td>
<td>45 - 145 µg/dL</td>
</tr>
<tr>
<td>14 - 17 years</td>
<td>34 - 162 µg/dL</td>
<td>28 - 184 µg/dL</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>42 - 175 µg/dL</td>
<td>29 - 189 µg/dL</td>
</tr>
</tbody>
</table>

Note:
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by x 0.179

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium.

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See "Calcium" and "Magnesium" entries for respective interferences.


See also Iron, Transferrin and Saturation of Iron-Binding Capacity

ADMINISTRATIVE

CPT Codes:
83540

LOINC Codes:
2498-4

COMPLETE VIEW

Available Stat:
Yes

Test Code:
IRON

Test Group:
Iron
Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric

Remarks:
Draw w/o hemolysis, which may artifactually increase the result. To avoid contamination, do not allow the specimen to come into contact with glass.

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
2 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
1 mL plasma or serum

Minimum Volume:
0.8 mL plasma or serum

Units:
µg/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 6 days</td>
<td>100 - 250 µg/dL</td>
<td>100 - 250 µg/dL</td>
</tr>
<tr>
<td>7 days - 11 months</td>
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<tr>
<td>1 - 5 years</td>
<td>22 - 136 µg/dL</td>
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<tr>
<td>6 - 9 years</td>
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</tr>
<tr>
<td>&gt;= 18 years</td>
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<td>29 - 189 µg/dL</td>
</tr>
</tbody>
</table>

Note:
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Reported:
Stat 1 hour, Routine 1 day

Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by x 0.179

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium.

The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum iron, gadolinium containing agents (Gadodiamide, Gadoversetamide, and Gadopentetate) may produce a falsely low result (on average, 75, 78, and 88% respectively, of the actual iron concentration).

See "Calcium" and "Magnesium" entries for respective interferences.


See also Iron, Transferrin and Saturation of Iron-Binding Capacity

CPT Codes:
83540

LOINC Codes:
Iron, Transferrin and % Transferrin Saturation Panel, Plasma / Serum

ORDERING

Available Stat: No
Performing Lab:
  Iron: Parnassus & Mission Bay Chemistry
  Transferrin: Immunology
Performed:
  Iron: Daily (all shifts)
  Transferrin & % Sat: Monday-Friday (day shift)
Methodology:
  Ferrozine Spectrophotometric & Rate nephelometry
Reported:
  1-3 days
Additional Information:
  Note: Iron and transferrin may be ordered separately.


Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference.

For serum iron, gadolinium containing agents (Gadodiamide, Gadoversetamide, and Gadopentetate) may produce a falsely low result (on average, 75, 78, and 88% respectively, of the actual iron concentration). See “Calcium” and “Magnesium” entries for respective interferences.

Reference:

COLLECTION

Patient Preparation:
  An 8 hour fast before specimen collection is preferred.
Sample Type:
  Plasma or serum
Collect:
  Light green top preferred, Gold top acceptable
Amount to Collect:
  3 mL blood
Preferred Volume:
  1.5 mL plasma or serum
Remarks:
  Avoid hemolysis.
Unacceptable Conditions:
Lipemia, hemolyzed

PROCESSING

Test Code: FE
Test Group: Iron
Performing Lab:
Iron: Parnassus & Mission Bay Chemistry
Transferrin: Immunology
Specimen Preparation:
Avoid contamination of Iron by pouring or using plastic pipette to transfer serum. Store at 2-8 C. Do NOT use a glass pipette.
Preferred Volume:
1.5 mL plasma or serum
Unacceptable Conditions:
Lipemia, hemolyzed

RESULT INTERPRETATION

Units:
µg/dL, mg/dL, %
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Iron</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1 week</td>
<td>100 - 250 µg/dL</td>
<td>100 - 250 µg/dL</td>
<td></td>
</tr>
<tr>
<td>1 week - 1 year</td>
<td>40 - 100 µg/dL</td>
<td>40 - 100 µg/dL</td>
<td></td>
</tr>
<tr>
<td>1 - 6 years</td>
<td>22 - 136 µg/dL</td>
<td>22 - 136 µg/dL</td>
<td></td>
</tr>
<tr>
<td>6 - 10 years</td>
<td>39 - 136 µg/dL</td>
<td>39 - 136 µg/dL</td>
<td></td>
</tr>
<tr>
<td>10 - 14 years</td>
<td>28 - 134 µg/dL</td>
<td>45 - 145 µg/dL</td>
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</tr>
<tr>
<td>&gt;18 years</td>
<td>42 - 175 µg/dL</td>
<td>29 - 189 µg/dL</td>
<td></td>
</tr>
</tbody>
</table>

Transferrin 182-360 mg/dL
Transferrin Saturation 10-47%

Note:
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Additional Information:

Note: Iron and transferrin may be ordered separately.


Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference.
For serum iron, gadolinium containing agents (Gadodiamide, Gadoversetamide, and Gadopentetate) may produce a falsely low result (on average, 75, 78, and 88% respectively, of the actual iron concentration). See "Calcium" and "Magnesium" entries for respective interferences.

Reference:

CPT Codes:
84466, 83540

LOINC Codes:
39778-6

Available Stat:
No

Test Code:
FE

Test Group:
Iron

Performing Lab:
Iron: Parnassus & Mission Bay Chemistry  
Transferrin: Immunology

Performed:
Iron: Daily (all shifts)  
Transferrin & % Sat: Monday-Friday (day shift)

Methodology:
Ferrozine Spectrophotometric & Rate nephelometry

Patient Preparation:
An 8 hour fast before specimen collection is preferred.

Remarks:
Avoid hemolysis.

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
3 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
1.5 mL plasma or serum

Unacceptable Conditions:
Lipemia, hemolyzed

Specimen Preparation:
Avoid contamination of Iron by pouring or using plastic pipette to transfer serum. Store at 2-8 C. Do NOT use a glass pipette.

Units:
µg/dL, mg/dL, %

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>0 - 1 week</td>
<td>100 - 250 µg/dL</td>
</tr>
<tr>
<td>1 week - 1 year</td>
<td>40 - 100 µg/dL</td>
</tr>
<tr>
<td>1 - 6 years</td>
<td>22 - 136 µg/dL</td>
</tr>
<tr>
<td>6 - 10 years</td>
<td>39 - 136 µg/dL</td>
</tr>
<tr>
<td>10 - 14 years</td>
<td>28 - 134 µg/dL</td>
</tr>
</tbody>
</table>
14 - 18 years: 34 - 162 µg/dL
>18 years: 42 - 175 µg/dL

Transferrin 182-360 mg/dL
Transferrin Saturation 10-47%

Note:
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Reported:
1-3 days

Additional Information:
Note: Iron and transferrin may be ordered separately.


Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference.

For serum iron, gadolinium containing agents (Gadodiamide, Gadoversetamide, and Gadopentetate) may produce a falsely low result (on average, 75, 78, and 88% respectively, of the actual iron concentration). See "Calcium" and "Magnesium" entries for respective interferences.

Reference:

CPT Codes:
84466, 83540

LOINC Codes:
39778-6
Isavuconazole
ISA

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Tuesday and Friday AM (excluding holidays)
Methodology: Liquid chromatography-tandem mass spectrometry (LC-MS/MS)
Reported: 3-4 days
Additional Information: Effective 3/28/18, isavuconazole testing will be performed in-house at China Basin Chemistry using LC-MS/MS. The results of this method are on average 13% lower than the results from Viracor.

Isavuconazole is an azole antifungal drug indicated for the treatment of life threatening fungal infections, specifically invasive aspergillosis and invasive mucormycosis. CYP3A4 inhibitors can significantly increase, and CYP3A4 inducers can significantly decrease, the serum concentration of isavuconazole. Isavuconazole is metabolized via CYP3A4, CYP3A5 and UGTs.

Synonyms:
- Cresemba
- Isavuconazonium sulfate

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Remarks: Collect trough levels just before next dose.
Stability (from collection to initiation):
- Refrigerated: 3 months
- Frozen: 2 years

PROCESSING

Test Code: ISA
Performing Lab: China Basin Chemistry
Specimen Preparation:
Centrifuge blood and separate serum from cells as soon as possible. Keep sample refrigerated.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.3 mL serum

**Stability (from collection to initiation):**
- Refrigerated: 3 months
- Frozen: 2 years

---

**RESULT INTERPRETATION**

**Units:**
- µg/mL (mcg/mL)

**Reference Interval:**
No specific therapeutic trough target has been established for isavuconazole. If help with interpretation of results is required, please contact Adult Antimicrobial Stewardship at 443-9421 or Pediatric Antimicrobial Stewardship at 514-1275.

**Additional Information:**
- Effective 3/28/18, isavuconazole testing will be performed in-house at China Basin Chemistry using LC-MS/MS.
- The results of this method are on average 13% lower than the results from Viracor.

Isavuconazole is an azole antifungal drug indicated for the treatment of life threatening fungal infections, specifically invasive aspergillosis and invasive mucormycosis. CYP3A4 inhibitors can significantly increase, and CYP3A4 inducers can significantly decrease, the serum concentration of isavuconazole. Isavuconazole is metabolized via CYP3A4, CYP3A5 and UGTs.

Reference:

---

**ADMINISTRATIVE**

**CPT Codes:**
- 80299

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- ISA

**Performing Lab:**
- China Basin Chemistry

**Performed:**
- Tuesday and Friday AM (excluding holidays)

**Methodology:**
- Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

**Remarks:**
- Collect trough levels just before next dose.

**Collect:**
- Red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL serum

- 0.3 mL serum

**Stability (from collection to initiation):**
- Refrigerated: 3 months
- Frozen: 2 years
1 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Specimen Preparation:**
- Centrifuge blood and separate serum from cells as soon as possible. Keep sample refrigerated.

**Units:**
- µg/mL (mcg/mL)

**Reference Interval:**
- No specific therapeutic trough target has been established for isavuconazole. If help with interpretation of results is required, please contact Adult Antimicrobial Stewardship at 443-9421 or Pediatric Antimicrobial Stewardship at 514-1275.

**Synonyms:**
- Cresemba
- Isavuconazonium sulfate

**Stability (from collection to initiation):**
- Refrigerated: 3 months
- Frozen: 2 years

**Reported:**
- 3-4 days

**Additional Information:**
- Effective 3/28/18, isavuconazole testing will be performed in-house at China Basin Chemistry using LC-MS/MS.

  The results of this method are on average 13% lower than the results from Viracor.

  Isavuconazole is an azole antifungal drug indicated for the treatment of life threatening fungal infections, specifically invasive aspergillosis and invasive mucormycosis. CYP3A4 inhibitors can significantly increase, and CYP3A4 inducers can significantly decrease, the serum concentration of isavuconazole. Isavuconazole is metabolized via CYP3A4, CYP3A5 and UGTs.

**Reference:**

**CPT Codes:**
- 80299

**LDT or Modified FDA:**
- Yes
## Islet Cell Antibody

### ICAB

<table>
<thead>
<tr>
<th>ORDERING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available Stat:</strong></td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
</tr>
<tr>
<td><strong>Reflex Testing:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COLLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample Type:</strong></td>
</tr>
<tr>
<td><strong>Collect:</strong></td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
</tr>
<tr>
<td><strong>Minimum Volume:</strong></td>
</tr>
<tr>
<td><strong>Stability (from collection to initiation):</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROCESSING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Code:</strong></td>
</tr>
<tr>
<td><strong>Sendout:</strong></td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
</tr>
<tr>
<td><strong>Specimen Preparation:</strong></td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
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<tr>
<td><strong>Minimum Volume:</strong></td>
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<tr>
<td><strong>Stability (from collection to initiation):</strong></td>
</tr>
</tbody>
</table>
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Islet cell antibody titer reported in JDF units (Reference Range: less than 1.25 JDF). End point titers are compared to a single international reference standard and values are reported in JDF (Juvenile Diabetes Foundation) units.

Type 1 diabetes is characterized by lymphocytic cell infiltrate of the pancreatic islets. Measurement of GAD-65, ICA-512, and Insulin Antibody is a highly sensitive means to assess risk and predict onset of Type I diabetes. There is a correlation between the number of positive antibodies and the antibody titers versus the severity of the autoimmune process.

ADMINISTRATIVE

CPT Codes:
86255-90

LOINC Codes:
45171-6

COMPLETE VIEW

Available Stat:
No

Test Code:
ICAB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunofluorescence

Collect:
Red top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Order Quest #52654P

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature two days, refrigerated two weeks, frozen at -20°C six months.

Reported:
Test performed Monday-Friday (AM). Turnaround 3-5 days

Reflex Testing:
Yes, if positive titer will be performed at an additional charge

Additional Information:
Islet cell antibody titer reported in JDF units (Reference Range: less than 1.25 JDF). End point titers are compared to a single international reference standard and values are reported in JDF (Juvenile Diabetes Foundation) units.
Type 1 diabetes is characterized by lymphocytic cell infiltrate of the pancreatic islets. Measurement of GAD-65, ICA-512, and Insulin Antibody is a highly sensitive means to assess risk and predict onset of Type I diabetes. There is a correlation between the number of positive antibodies and the antibody titers versus the severity of the autoimmune process.

CPT Codes:
86255-90

LOINC Codes:
45171-6
**Islet Cell Antigen 512 Antibody**

**ICA**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Radio Binding Assay

**Reported:**
Test performed Wednesday and Friday. Turnaround 3-6 days

**Synonyms:**
- IA2 Antibodies
- ICA512 Autoantibodies
- Tyrosine Phosphatase Autoantibodies

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top or Gold top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**PROCESSING**

**Test Code:**
ICA

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Refrigerate sample. Order Quest # 86736N

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**RESULT INTERPRETATION**

**Units:**
Index

**Reference Interval:**
Children and adults positive result: 0.070 or greater (Index)
CPT Codes:
83519-90

LOINC Codes:
31209-0

Available Stat:
No

Test Code:
ICA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Radio Binding Assay

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Refrigerate sample. Order Quest # 86736N

Units:
Index

Reference Interval:
Children and adults positive result: 0.070 or greater (Index)

Synonyms:
- IA2 Antibodies
- ICA512 Autoantibodies
- Tyrosine Phosphatase Autoantibodies

Reported:
Test performed Wednesday and Friday. Turnaround 3-6 days

CPT Codes:
83519-90

LOINC Codes:
31209-0
Isohemagglutinin Titer
ISO

**ORDERING**

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test performed Monday-Friday

Reported:
1-3 days.

Synonyms:
- ABO titer
- Isoagglutinin titer

**COLLECTION**

Sample Type:
EDTA whole blood

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
2.0 mL blood

Remarks:
Use Blood Bank Requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
72 hours (ambient) or 7 days (refrigerated).

**PROCESSING**

Test Code:
ISO

Performing Lab:
Parnassus & Mission Bay Blood Banks

Preferred Volume:
6 mL blood

Minimum Volume:
2.0 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Stability (from collection to initiation):
72 hours (ambient) or 7 days (refrigerated).
CPT Codes:
86886

COMPLETE VIEW

Available Stat:
No

Test Code:
ISO

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test performed Monday-Friday

Remarks:
Use Blood Bank Requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
2.0 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Synonyms:
- ABO titer
- Isoagglutinin titer

Stability (from collection to initiation):
72 hours (ambient) or 7 days (refrigerated).

Reported:
1-3 days.

CPT Codes:
86886
**Itraconazole**

**ITRC**

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- HPLC

**Reported:**
- 3-5 days

**Synonyms:**
- Sporanox

**COLLECTION**

**Sample Type:**
- Serum

**Collect:**
- Red top

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Stability (from collection to initiation):**
- Frozen 2 weeks.

**Unacceptable Conditions:**
- Collected in serum separator tube

**PROCESSING**

**Test Code:**
- ITRC

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Aliquot and freeze sample, Transport frozen to CB.

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Unacceptable Conditions:**
- Collected in serum separator tube

**Stability (from collection to initiation):**
- Frozen 2 weeks.

**RESULT INTERPRETATION**
Units:
μg/mL (mcg/mL)

Reference Interval:
<0.1 μg/mL

ADMINISTRATIVE

CPT Codes:
82492-90

COMPLETE VIEW

Available Stat:
No

Test Code:
ITRC

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Collect:
Red top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
1 mL serum

Unacceptable Conditions:
Collected in serum separator tube

Specimen Preparation:
Aliquot and freeze sample. Transport frozen to CB.

Units:
μg/mL (mcg/mL)

Reference Interval:
<0.1 μg/mL

Synonyms:
• Sporanox

Stability (from collection to initiation):
Frozen 2 weeks.

Reported:
3-5 days

CPT Codes:
82492-90
JAK2 Break-apart rearrangement FISH
9JAK2, B9JAK2

ORDERING

Performing Lab:
Cytogenetics

Performed:
Monday - Friday, 9 am - 5 pm

Methodology:
FISH

Reported:
7-14 days

Synonyms:
- 9JAK2
- B9JAK2
- 9p24 Break-apart FISH

COLLECTION

Sample Type:
Blood or bone marrow

Collect:
Blood and bone marrow aspirate: Dark green top
Bone marrow core: Sterile container

Amount to Collect:
See Preferred Volume

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Stability (from collection to initiation):
2 days

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen

PROCESSING

Test Code:
- Blood: B9JAK2
- Bone marrow: 9JAK2

Performing Lab:
Cytogenetics

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
- 88271x2, 88275x1

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**COMPLETE VIEW**

**Test Code:**
- Blood: B9JAK2
- Bone marrow: 9JAK2

**Performing Lab:**
- Cytogenetics

**Performed:**
- Monday - Friday, 9 am - 5 pm

**Methodology:**
- FISH

**Collect:**
- Blood and bone marrow aspirate: Dark green top
- Bone marrow core: Sterile container

**Amount to Collect:**
- See Preferred Volume

**Sample Type:**
- Blood or bone marrow

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen

**Synonyms:**
- 9JAK2
- B9JAK2
- 9p24 Break-apart FISH

**Storage/Transport Temperature:**
- Room temperature

**Stability (from collection to initiation):**
- 2 days

**Reported:**
- 7-14 days

**CPT Codes:**
- 88271x2, 88275x1

---

Printed 06/07/19
Test information subject to change
Janus Kinase 2 Exon 12 and 13 mutations
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
PCR / Sequencing
Reported:
3 - 5 days
Synonyms:
• JAK2 exon 12 and 13 mutations

COLLECTION

Sample Type:
EDTA Whole blood
Collect:
Lavendar top (6 mL size)
Amount to Collect:
Blood: 6 mL
Bone Marrow: 3 mL
Preferred Volume:
Blood: 6 mL
Bone Marrow: 3 mL
Minimum Volume:
Blood: 4 mL
Bone Marrow: 2 mL
Remarks:
Submission of whole blood (preferred). Record the draw time and date on the tube.
Keep sample at room temperature and deliver to lab asap.
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 3 days, frozen unacceptable
Rejection Criteria:
Frozen samples

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
JAK2
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Maintain at room temperature and transport to CB. Order Quest test code 16536X.
Preferred Volume:
Blood: 6 mL
Bone Marrow: 3 mL
**Minimum Volume:**
- Blood: 4 mL
- Bone Marrow: 2 mL

**Rejection Criteria:**
- Frozen samples

**Stability (from collection to initiation):**
- Room temperature 3 days, refrigerated 3 days, frozen unacceptable

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Test Group:**
- JAK2

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- PCR / Sequencing

**Remarks:**
- Submission of whole blood (preferred). Record the draw time and date on the tube.
- Keep sample at room temperature and deliver to lab asap.

**Collect:**
- Lavendar top (6 mL size)

**Amount to Collect:**
- Blood: 6 mL
- Bone Marrow: 3 mL

**Sample Type:**
- EDTA Whole blood

**Preferred Volume:**
- Blood: 6 mL
- Bone Marrow: 3 mL

**Minimum Volume:**
- Blood: 4 mL
- Bone Marrow: 2 mL

**Rejection Criteria:**
- Frozen samples

**Specimen Preparation:**
- Maintain at room temperature and transport to CB. Order Quest test code 16536X.

**Synonyms:**
- JAK2 exon 12 and 13 mutations

**Stability (from collection to initiation):**
- Room temperature 3 days, refrigerated 3 days, frozen unacceptable

**Reported:**
- 3 - 5 days
Janus kinase 2 Mutation, Qualitative
JAK2

ORDERING

Ordering Recommendations:
Patients suspicious for chronic myeloproliferative disorders (PV, ET or PMF excluding CML), but having equivocal morphology and/or clinical picture. In cases suspected of PV, EPO level should be evaluated to rule out secondary erythrocytosis before JAK2 mutation test is considered; while, in cases suspicious for ET, serum iron and ferritin should be checked to rule out secondary thrombocytosis. The cases, which fulfill diagnostic criteria for PV or other MPD, are not indicated for this test because currently, JAK2 mutation has no prognostic significance and is not used as a minimal residual disease marker.

V617F is found in approximately 95% of patients with polycythemia vera. It is also found in approximately 50% of patients with essential thrombocytopenia (ET) or primary myelofibrosis (PMF). The detection of V617F complements histological findings aimed at the diagnosis of ET and PMF.

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 2x per week, Tuesday & Thursday, day shift only
Methodology:
PCR and allele-specific hybridization
Reported:
7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Clinical Significance:
A somatic mutation in a highly conserved residue of the Janus kinase (JAK2) on chromosome 9 was detected in 80% of patients with polycythemia vera(PV), and 30-50% of patients with essential thrombocytopenia (ET) or primary myelofibrosis (PMF). This point mutation in exon 14 of JAK2 alters codon 617 from a valine to a phenylalanine residue on JH2 domain of JAK2 kinase, thus disrupting auto-inhibitory property of this pseudokinase domain and leading to constitutive activation of the tyrosine kinase. This enhanced JAK2 kinase activity is thought to confer erythropoietin hypersensitivity and erythropoietin independent survival to the myeloid stem cells. Although JAK2 V617F mutation has been detected in variable percentage of patients with other type of myeloid malignancies, normal individuals tested so far are exclusively negative for the mutation.

Limitations:
This assay has 1% DNA sensitivity of the JAK2 V617F mutation in a background of 99% DNA without the mutation. A positive result is strongly supportive of a diagnosis of PV, ET or CIMF.

A negative result does not rule out the presence of V617F at a level below the sensitivity of this assay and does not exclude the presence of other mutations in the JAK2 gene.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

Synonyms:
- V617F
- Myeloproliferative disorders
- MPD
- JAK2

COLLECTION

Sample Type:
EDTA Whole blood or bone marrow aspirate
Collect:
  Lavender top (3 mL)

Amount to Collect:
  Blood: 3 mL
  Bone marrow aspirate: 1 mL

Preferred Volume:
  Blood: 3 mL
  Bone marrow aspirate: 1 mL

Minimum Volume:
  Blood: 1 mL
  Bone marrow aspirate: 0.4 mL

Remarks:
  Avoid hemolysis.
  Due to stability issues these samples should only be collected Monday through noon Friday.
  Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):
  Room temperature 3 days, refrigerated 3 days, frozen at -20C Unacceptable.

Unacceptable Conditions:
  Heparinized sample submitted. Samples collected outside of stated time frames.

PROCESSING

Test Code:
  JAK2

Test Group:
  JAK2

Performing Lab:
  Medical Genomics - Molecular Diagnostics

Specimen Preparation:
  Do not centrifuge. Refrigerate sample but do not freeze. Ship refrigerated.

Preferred Volume:
  Blood: 3 mL
  Bone marrow aspirate: 1 mL

Minimum Volume:
  Blood: 1 mL
  Bone marrow aspirate: 0.4 mL

Unacceptable Conditions:
  Heparinized sample submitted. Samples collected outside of stated time frames.

Stability (from collection to initiation):
  Room temperature 3 days, refrigerated 3 days, frozen at -20C Unacceptable.

RESULT INTERPRETATION

Reference Interval:
  Negative

Additional Information:
  An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
  Clinical Significance:
  A somatic mutation in a highly conserved residue of the Janus kinase (JAK2) on chromosome 9 was detected in 80% of patients with polycythemia vera (PV), and 30-50% of patients with essential thrombocythemia (ET) or primary myelofibrosis (PMF). This point mutation in exon 14 of JAK2 alters codon 617 from a valine to a phenylalanine residue on JH2 domain of JAK2 kinase, thus disrupting auto-inhibitory property of this pseudokinase domain and leading to constitutive activation of the tyrosine kinase. This enhanced JAK2 kinase activity is thought to confer erythropoietin hypersensitivity and erythropoietin independent survival to the myeloid stem cells. Although JAK2 V617F mutation has been detected in variable percentage of patients with other type of myeloid malignancies, normal
individuals tested so far are exclusively negative for the mutation.

Limitations:
This assay has 1% DNA sensitivity of the JAK2 V617F mutation in a background of 99% DNA without the mutation. A positive result is strongly supportive of a diagnosis of PV, ET or CIMF.

A negative result does not rule out the presence of V617F at a level below the sensitivity of this assay and does not exclude the presence of other mutations in the JAK2 gene.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

CPT Codes:
81270

LDT or Modified FDA:
Yes

LOINC Codes:
48726-4

Available Stat:
No

Ordering Recommendations:
Patients suspicious for chronic myeloproliferative disorders (PV, ET or PMF excluding CML), but having equivocal morphology and/or clinical picture. In cases suspected of PV, EPO level should be evaluated to rule out secondary erythrocytosis before JAK2 mutation test is considered; while in cases suspicious for ET, serum iron and ferritin should be checked to rule out secondary thrombocytosis. The cases, which fulfill diagnostic criteria for PV or other MPD, are not indicated for this test because currently, JAK2 mutation has no prognostic significance and is not used as a minimal residual disease marker.

V617F is found in approximately 95% of patients with polycythemia vera. It is also found in approximately 50% of patients with essential thrombocytopenia (ET) or primary myelofibrosis (PMF). The detection of V617F complements histological findings aimed at the diagnosis of ET and PMF.

Test Code:
JAK2

Test Group:
JAK2

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 2x per week, Tuesday & Thursday, day shift only

Methodology:
PCR and allele-specific hybridization

Remarks:
Avoid hemolysis.

Due to stability issues these samples should only be collected Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top (3 mL)

Amount to Collect:
Blood: 3 mL
Bone marrow aspirate: 1 mL

Sample Type:
EDTA Whole blood or bone marrow aspirate

**Preferred Volume:**
- Blood: 3 mL
- Bone marrow aspirate: 1 mL

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 0.4 mL

**Unacceptable Conditions:**
- Heparinized sample submitted. Samples collected outside of stated time frames.

**Specimen Preparation:**
- Do not centrifuge. Refrigerate sample but do not freeze. Ship refrigerated.

**Reference Interval:**
- Negative

**Synonyms:**
- V617F
- Myeloproliferative disorders
- MPD
- JAK2

**Stability (from collection to initiation):**
- Room temperature 3 days, refrigerated 3 days, frozen at -20°C Unacceptable.

**Reported:**
- 7-10 days

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**Clinical Significance:**
A somatic mutation in a highly conserved residue of the Janus kinase (JAK2) on chromosome 9 was detected in 80% of patients with polycythemia vera (PV), and 30-50% of patients with essential thrombocythemia (ET) or primary myelofibrosis (PMF). This point mutation in exon 14 of JAK2 alters codon 617 from a valine to a phenylalanine residue on JH2 domain of JAK2 kinase, thus disrupting auto-inhibitory property of this pseudokinase domain and leading to constitutive activation of the tyrosine kinase. This enhanced JAK2 kinase activity is thought to confer erythropoietin hypersensitivity and erythropoietin independent survival to the myeloid stem cells. Although JAK2 V617F mutation has been detected in variable percentage of patients with other type of myeloid malignancies, normal individuals tested so far are exclusively negative for the mutation.

**Limitations:**
This assay has 1% DNA sensitivity of the JAK2 V617F mutation in a background of 99% DNA without the mutation. A positive result is strongly supportive of a diagnosis of PV, ET or CIMF.

A negative result does not rule out the presence of V617F at a level below the sensitivity of this assay and does not exclude the presence of other mutations in the JAK2 gene.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. Performance characteristics refer to the analytical performance of the test.

**CPT Codes:**
- 81270

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 48726-4
Janus Kinase 2, All Exons by NGS
JAK2SQ, JAKQBM

ORDERING

Performing Lab:
Molecular Diagnostics

Performed:
Batched assay performed once every 2-4 weeks.

Methodology:
PCR and Next Generation Sequencing

Reported:
10-28 days

Additional Information:
The JAK2 gene encompasses 23 coding exons that encode for a 1132 amino acid protein with tyrosine kinase activity. Deleterious mutations in the JAK2 gene could lead to disrupted protein function and ensuing unregulated tyrosine phosphorylation activity. JAK2 mutations account for approximately 95% of patients with polycythemia vera (PV) and 50-60% of patients with essential thrombocytopenia (ET) and primary myelofibrosis.

This assay is based on next generation DNA sequencing (NGS). It will detect mutations in all JAK2 coding exons, such as the common V617F mutation in exon 14, and previously reported mutations in exons 12 and 15. In addition, the assay will detect mutations in any other exon.

The quantitative nature of the assay is valuable to monitor the allele burden of a mutation in minimal residual disease during drug treatments, such as JAK2 inhibitors. This assay has a mutation detection sensitivity of about 2% and can be performed on blood and bone marrow for tumor specimens and buccal swabs for germline controls.

Reflex Testing:
A professional interpretation may be performed and billed separately.

Synonyms:
- JAK2
- JAK2SQ
- JAKQBM

COLLECTION

Sample Type:
EDTA whole blood, EDTA bone marrow, Miscellaneous tissue samples, Buccal swabs (Cytology brushes preferred)

Collect:
Lavender top tube

Amount to Collect:
3 mL

Preferred Volume:
3 mL

Minimum Volume:
0.5 mL

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

For initial submission, please collect two buccal swabs for germline analysis.

Stability (from collection to initiation):
Whole blood and Bone marrow samples are stable refrigerated for 1 week

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Test information subject to change
**PROCESSING**

**Test Code:**
- JAK2SQ (blood)
- JAKQBM (non-blood)

**Performing Lab:**
Molecular Diagnostics

**Preferred Volume:**
3 mL

**Minimum Volume:**
0.5 mL

**Unacceptable Conditions:**
- Inadequate sample. Samples collected in heparin.

**Stability (from collection to initiation):**
- Whole blood and Bone marrow samples are stable refrigerated for 1 week

**Storage/Transport Temperature:**
- Room temperature

**RESULT INTERPRETATION**

**Reference Interval:**
- No mutations detected

**Additional Information:**
The JAK2 gene encompasses 23 coding exons that encode for a 1132 amino acid protein with tyrosine kinase activity. Deleterious mutations in the JAK2 gene could lead to disrupted protein function and ensuing unregulated tyrosine phosphorylation activity. JAK2 mutations account for approximately 95% of patients with polycythemia vera (PV) and 50-60% of patients with essential thrombocythemia (ET) and primary myelofibrosis.

This assay is based on next generation DNA sequencing (NGS). It will detect mutations in all JAK2 coding exons, such as the common V617F mutation in exon 14, and previously reported mutations in exons 12 and 15. In addition, the assay will detect mutations in any other exon.

The quantitative nature of the assay is valuable to monitor the allele burden of a mutation in minimal residual disease during drug treatments, such as JAK2 inhibitors. This assay has a mutation detection sensitivity of about 2% and can be performed on blood and bone marrow for tumor specimens and buccal swabs for germline controls.

**ADMINISTRATIVE**

**CPT Codes:**
- 81403

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 48726-4

**COMPLETE VIEW**

**Test Code:**
- JAK2SQ (blood)
- JAKQBM (non-blood)

**Performing Lab:**
Molecular Diagnostics

**Performed:**
- Batched assay performed once every 2-4 weeks.

**Methodology:**
PCR and Next Generation Sequencing

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

For initial submission, please collect two buccal swabs for germline analysis.

Collect:
Lavender top tube

Amount to Collect:
3 mL

Sample Type:
EDTA whole blood, EDTA bone marrow, Miscellaneous tissue samples, Buccal swabs (Cytology brushes preferred)

Preferred Volume:
3 mL

Minimum Volume:
0.5 mL

Unacceptable Conditions:
Inadequate sample. Samples collected in heparin.

Reference Interval:
No mutations detected

Synonyms:
- JAK2
- JAK2SQ
- JAKQBM

Storage/Transport Temperature:
Room temperature

Stability (from collection to initiation):
Whole blood and Bone marrow samples are stable refrigerated for 1 week

Reported:
10-28 days

Reflex Testing:
A professional interpretation may be performed and billed separately.

Additional Information:
The JAK2 gene encompasses 23 coding exons that encode for a 1132 amino acid protein with tyrosine kinase activity. Deleterious mutations in the JAK2 gene could lead to disrupted protein function and ensuing unregulated tyrosine phosphorylation activity. JAK2 mutations account for approximately 95% of patients with polycythemia vera (PV) and 50-60% of patients with essential thrombocytopenia (ET) and primary myelofibrosis.

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The quantitative nature of the assay is valuable to monitor the allele burden of a mutation in minimal residual disease during drug treatments, such as JAK2 inhibitors. This assay has a mutation detection sensitivity of about 2% and can be performed on blood and bone marrow for tumor specimens and buccal swabs for germline controls.

CPT Codes:
81403

LDT or Modified FDA:
Yes

LOINC Codes:
48726-4
JC Virus Antibody with Reflex to Inhibition Assay

**ORDERING**

**Performing Lab:**
Focus via Quest

**Methodology:**
Immunoassay

**Reported:**
7-10 days

**Additional Information:**
The JC Virus (JCV) is associated with Progressive Multifocal Leukoencephalopathy (PML). Detection of antibodies to JCV in serum or plasma is a reliable indicator of exposure to JCV. The analytical performance characteristics were determined for multiple sclerosis patients.

**Reflex Testing:**
If the JCV Antibody result is, "INDETERMINATE", STRATIFY JCV™ Antibody Inhibition Assay will be performed at an additional charge (CPT code(s): 86711)

**Synonyms:**
- John Cunningham virus

**COLLECTION**

**Sample Type:**
Serum or plasma

**Collect:**
Gold top, red top or Lavender top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.25 mL serum or plasma

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen 3 months

**PROCESSING**

**Test Code:**
JCAB

**Test Group:**
JCV

**Sendout:**
Yes

**Performing Lab:**
Focus via Quest

**Specimen Preparation:**
Aliquot and freeze. Ship to CB frozen. Order Quest test code 91665

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.25 mL serum or plasma

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen 3 months
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
The JC Virus (JCV) is associated with Progressive Multifocal Leukoencephalopathy (PML). Detection of antibodies to JCV in serum or plasma is a reliable indicator of exposure to JCV. The analytical performance characteristics were determined for multiple sclerosis patients.

ADMINISTRATIVE

CPT Codes:
86790-90

COMPLETE VIEW

Test Code:
JCAB

Test Group:
JCV

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immuoassay

Collect:
Gold top, red top or Lavender top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.25 mL serum or plasma

Specimen Preparation:
Aliquot and freeze. Ship to CB frozen. Order Quest test code 91665

Reference Interval:
Negative

Synonyms:
- John Cunningham virus

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 3 months

Reported:
7-10 days

Reflex Testing:
If the JCV Antibody result is, "INDETERMINATE", STRATIFY JCV™ Antibody Inhibition Assay will be performed at an additional charge (CPT code(s): 86711)

Additional Information:
The JC Virus (JCV) is associated with Progressive Multifocal Leukoencephalopathy (PML). Detection of antibodies to JCV in serum or plasma is a reliable indicator of exposure to JCV. The analytical performance characteristics were determined for multiple sclerosis patients.

CPT Codes:
### JC Virus DNA, Quantitative

**JCV**

#### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Viracor</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Real time PCR</td>
</tr>
</tbody>
</table>

**Reported:**

Test run Monday-Friday. Results Available within 24 hours of specimen receipt at Viracor.

#### Additional Information:

JCV is the etiologic agent of progressive multifocal leukoencephalopathy (PML) which is mainly seen in HIV patients, organ transplant patients and other immunodeficient syndromes. In addition to PML, JCV also causes nephropathy in the renal transplant setting although with considerably less frequency than BKV.

JCV should always be considered in an immunocompromised patient with progressively deteriorating CNS function. Quantitative JCV DNA PCR can be used to detect JCV in CSF in the setting of CNS disease and blood and urine in the setting of renal dysfunction. The DNA PCR can be used to track the course of the infection as well as monitor response to treatment.

Assay range: 100-1.0x10^8 copies/mL

#### Synonyms:

- JC virus PCR
- John Cunningham virus
- JVC

#### COLLECTION

**Sample Type:**

Preferred sample is EDTA plasma.

Testing may be performed on other sample types: serum, CSF, random urine, fresh or paraffin embedded tissue with approval.

**Collect:**

Lavender top preferred. Gold top, Red top, urine cup, CSF tube or sterile collection tube acceptable with approval.

**Amount to Collect:**

- 6 mL blood (Lavender top) or 6 mL blood (Gold or Red top), random urine (See preferred volume)

**Preferred Volume:**

- Plasma: 3 mL
- CSF: 1 mL
- Urine: 5 mL
- Tissue: 1mm x 1mm

**Minimum Volume:**

- Plasma: 2 mL
- CSF: 1 mL
- Urine: 5 mL

**Remarks:**

Fresh tissue specimens must be placed in saline in a red top tube to prevent dehydration

**Unacceptable Conditions:**

- Improperly submitted sample

#### PROCESSING

**Test Code:**
JCV

Test Group:
JCV

Sendout:
Yes

Performing Lab:
Viracor

Specimen Preparation:
- Keep plasma, whole blood and urine specimens at room temperature. Ship at room temperature.
- Fresh tissue specimens must be placed in saline to prevent dehydration during shipping. Ship at room temperature.
- Freeze CSF and ship frozen on dry ice.

Send samples to China Basin for Medical Courier pickup at 1600 hours. Monday-Friday.

Preferred Volume:
- Plasma: 3 mL
- CSF: 1 mL
- Urine: 5 mL
- Tissue: 1mm x 1mm

Minimum Volume:
- Plasma: 2 mL
- CSF: 1 mL
- Urine: 5 mL

Unacceptable Conditions:
- Improperly submitted sample

RESULT INTERPRETATION

Units:
copies/mL

Reference Interval:
- Not detected

Additional Information:
JCV is the etiologic agent of progressive multifocal leukoencephalopathy (PML) which is mainly seen in HIV patients, organ transplant patients and other immunodeficient syndromes. In addition to PML, JCV also causes nephropathy in the renal transplant setting although with considerably less frequency than BKV.

JCV should always be considered in an immunocompromised patient with progressively deteriorating CNS function. Quantitative JCV DNA PCR can be used to detect JCV in CSF in the setting of CNS disease and blood and urine in the setting of renal dysfunction. The DNA PCR can be used to track the course of the infection as well as monitor response to treatment.

Assay range: 100-1.0x10^6 copies/mL

ADMINISTRATIVE

CPT Codes:
- 87799-90

LOINC Codes:
- 49412-0

COMPLETE VIEW

Available Stat:
No

Test Code:
JCV
Test Group:
  JCV
Performing Lab:
  Viracor
Sendout:
  Yes
Methodology:
  Real time PCR
Remarks:
  Fresh tissue specimens must be placed in saline in a red top tube to prevent dehydration
Collect:
  Lavender top preferred. Gold top, Red top, urine cup, CSF tube or sterile collection tube acceptable with approval.
Amount to Collect:
  6 mL blood (Lavender top) or 6 mL blood (Gold or Red top), random urine (See preferred volume)
Sample Type:
  Preferred sample is EDTA plasma.
  Testing may be performed on other sample types: serum, CSF, random urine, fresh or paraffin embedded tissue with approval.
Preferred Volume:
  Plasma: 3 mL
  CSF: 1 mL
  Urine: 5 mL
  Tissue: 1mm x 1mm
Minimum Volume:
  Plasma: 2 mL
  CSF: 1 mL
  Urine: 5 mL
Unacceptable Conditions:
  Improperly submitted sample
Specimen Preparation:
  Keep plasma, whole blood and urine specimens at room temperature. Ship at room temperature.
  Fresh tissue specimens must be placed in saline to prevent dehydration during shipping. Ship at room temperature.
  Freeze CSF and ship frozen on dry ice.
Send samples to China Basin for Medical Courier pickup at 1600 hours. Monday-Friday.
Units:
  copies/mL
Reference Interval:
  Not detected
Synonyms:
  • JC virus PCR
  • John Cunningham virus
  • JVC
Reported:
  Test run Monday-Friday. Results Available within 24 hours of specimen receipt at Viracor.
Additional Information:
  JCV is the etiologic agent of progressive multifocal leukoencephalopathy (PML) which is mainly seen in HIV patients, organ transplant patients and other immunodeficient syndromes. In addition to PML, JCV also causes nephropathy in the renal transplant setting although with considerably less frequency than BKV.
  JCV should always be considered in an immunocompromised patient with progressively deteriorating CNS function. Quantitative JCV DNA PCR can be used to detect JCV in CSF in the setting of CNS disease and blood and urine in the setting of renal dysfunction. The DNA PCR can be used to track the course of the infection as well as monitor response to treatment.
Assay range: 100-1.0x10^8 copies/mL
CPT Codes:
87799-90
LOINC Codes:
49412-0
**Jo-1 Antibody**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Enzyme immunoassay

**Reported:**
4-5 days

**Additional Information:**
Jo-1 Antibody is found in patients with idiopathic inflammatory myopathies including approximately one-fourth of patients with advanced polymyositis and dermatomyositis. Jo-1 Antibody is associated with pulmonary disease and arthropathy

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed or lipemic samples.

**PROCESSING**

**Test Code:**
JO1

**Sendout:**
Yes

**Performing Lab:**
Quest

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed or lipemic samples.

**RESULT INTERPRETATION**

**Units:**
AI

**Reference Interval:**
<1.0 AI
Additional Information:
Jo-1 Antibody is found in patients with idiopathic inflammatory myopathies including approximately one-fourth of patients with advanced polymyositis and dermatomyositis. Jo-1 Antibody is associated with pulmonary disease and arthropathy

CPT Codes:
86235-90

Available Stat:
No
Test Code:
JO1
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzyme immunoassay
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Grossly hemolyzed or lipemic samples.
Units:
AI
Reference Interval:
<1.0 AI
Reported:
4-5 days
Additional Information:
Jo-1 Antibody is found in patients with idiopathic inflammatory myopathies including approximately one-fourth of patients with advanced polymyositis and dermatomyositis. Jo-1 Antibody is associated with pulmonary disease and arthropathy

CPT Codes:
86235-90
Juvenile Myelomonocytic Leukemia Associated Exon Panel - Family F/U
FJMML

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 1st and 3rd Monday of every month, day shift only
Methodology:
Next Generation Sequencing
Reported:
2-4 weeks
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This sequencing test sequences one exon of the following genes: CBL exons 8 & 9; KRAS exons 2 & 3; NRAS exons 2 & 3; PTPN11 exons 3, 4 & 13.

Targeted, single exon, germline and family follow-up studies will only be performed when the diagnostic mutation was determined by the UCSF Molecular Diagnostics lab, or a report from another CLIA lab can be provided. Otherwise, please order “JMML Associated Exon Panel (JMML)” for testing.

For questions, contact the Molecular Diagnostics laboratory at 415-514-8488

Synonyms:
- JMML Panel
- CBL exons 8 & 9
- KRAS exons 2 & 3
- NRAS exons 2 & 3
- PTPN11 exons 3, 4 & 13

COLLECTION

Sample Type:
EDTA whole blood, bone marrow, cultured fibroblasts or buccal swab
Collect:
Blood or Bone marrow: Lavender top (EDTA)
Germiline (non-tumor) sample: T25 flask or buccal swab
Amount to Collect:
See Preferred Volume
Preferred Volume:
Blood: 5 mL
Bone marrow: 3 mL
Germiline sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2
Minimum Volume:
Blood: 3 mL
Bone marrow: 2 mL
Germiline sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2
Remarks:
Avoid hemolysis.

Due to stability issues these samples should only be collected Monday through noon Friday
PROCESSING

Test Code:
FJMML

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

Preferred Volume:
- Blood: 5 mL
- Bone marrow: 3 mL
- Germline sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2

Minimum Volume:
- Blood: 3 mL
- Bone marrow: 2 mL
- Germline sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This sequencing test sequences one exon of the following genes: CBL exons 8 & 9; KRAS exons 2 & 3; NRAS exons 2 & 3; PTPN11 exons 3, 4 & 13.

Targeted, single exon, germline and family follow-up studies will only be performed when the diagnostic mutation was determined by the UCSF Molecular Diagnostics lab, or a report from another CLIA lab can be provided. Otherwise, please order “JMML Associated Exon Panel (JMML)" for testing.

For questions, contact the Molecular Diagnostics laboratory at 415-514-8488

ADMINISTRATIVE

CPT Codes:
- 81479, except for specific mutations
- Specific codons/exons Test code CPT-4
  - KRAS codons 12 & 13 FJMML2 81275
  - KRAS exon 3 FJMML3 81403
  - NRAS exons 1 & 2 FJMML4 81404
  - All others FJMML 81479

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
FJMML

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1st and 3rd Monday of every month, day shift only

Methodology:
Next Generation Sequencing
Remarks:
Avoid hemolysis.

Due to stability issues these samples should only be collected Monday through noon Friday

Collect:
Blood or Bone marrow: Lavender top (EDTA)
Germine (non-tumor) sample: T25 flask or buccal swab

Amount to Collect:
See Preferred Volume

Sample Type:
EDTA whole blood, bone marrow, cultured fibroblasts or buccal swab

Preferred Volume:
Blood: 5 mL
Bone marrow: 3 mL
Germine sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2

Minimum Volume:
Blood: 3 mL
Bone marrow: 2 mL
Germine sample: Cultured fibroblasts (confluent T25 flasks x2) or buccal swab x2

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

Reference Interval:
Negative

Synonyms:
- JMML Panel
- CBL exons 8 & 9
- KRAS exons 2 & 3
- NRAS exons 2 & 3
- PTPN11 exons 3, 4 & 13

Reported:
2-4 weeks

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This sequencing test sequences one exon of the following genes: CBL exons 8 & 9; KRAS exons 2 & 3; NRAS exons 2 & 3; PTPN11 exons 3, 4 & 13.

Targeted, single exon, germline and family follow-up studies will only be performed when the diagnostic mutation was determined by the UCSF Molecular Diagnostics lab, or a report from another CLIA lab can be provided. Otherwise, please order "JMML Associated Exon Panel (JMML)" for testing.

For questions, contact the Molecular Diagnostics laboratory at 415-514-8488

CPT Codes:
81479, except for specific mutations
Specific codons/exons Test code CPT-4
KRAS codons 12 & 13 FJMML2 81275
KRAS exon 3 FJMML3 81403
NRAS exons 1 & 2 FJMML4 81404
All others FJMML 81479

LDT or Modified FDA:
Yes
Juvenile Myelomonocytic Leukemia Associated Exon Panel
JMML

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Runs are usually setup bi-weekly, day shift only. Run schedule could be modified depending on sample volume.

Methodology:
Massive Parallel Next Generation DNA Sequencing

Reported:
2-4 weeks

Additional Information:
An interpretation of this test by a laboratory physician will be automatically performed and billed for separately.

This assay encompasses the DNA sequencing of all exons in each of the following genes: NRAS, KRAS, PTPN11, CBL, NF1, SETBP1, SH2B3, ASXL1, JAK3.

This assay is quantitative and is also intended for minimal residual disease to monitor the allele burden of one or more previously uncovered mutations in a patient. The sensitivity of detecting a somatic variant is 1-2%.

Juvenile myelomonocytic leukemia (JMML) is a rare and aggressive pediatric leukemia with poor prognosis. It is characterized by excessive proliferation of myelomonocytes that infiltrate hematopoietic and non-hematopoietic tissues.

While the suspicion of JMML is aided by clinical and hematological criteria, the additional finding of a pathogenic DNA variant previously known to be associated with JMML is often the tipping point in establishing a JMML diagnosis.

A characteristic feature of JMML is the presence of a somatic or germline mutation in RAS pathway genes such as NRAS, KRAS, PTPN11, CBL and NF1, which altogether are mutated in about 70% of JMML cases. Mutations outside the RAS pathway have been suggested to constitute secondary mutations that could also lead to the development of JMML and impact on its progression. For example, SETBP1 and JAK3 were found to constitute common targets for secondary mutations. In addition, deleterious mutations in SH2B3 have been associated with the promotion of leukemogenesis, particularly ALL, and are considered as leukemia predisposing variants. Furthermore, heterozygous somatic mutations in ASXL1 may act as tumor suppressor in myeloid malignancies such as AML and CMML, thus assisting in the differential diagnosis of JMML.

Detected variants of known clinical significance in the 9 genes will be reported. In cases when one or two genes of interest are requested, the clinically significant variants of only these genes will be reported.

References

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

Synonyms:
- JMML Panel
- CBL exons 8/9
- KRAS exons 2/3
- NRAS exons 2/3
- PTPN11 exons 3/4/13
Sample Type:
- Tumor sample EDTA whole blood or Bone marrow aspirate
- Germline sample Buccal swab or Cultured fibroblasts

**Note:** Buccal swabs are required for all new patients. (MDX lab 415-514-8488)

Collect:
- Lavender top (EDTA) Blood or bone marrow Buccal swab or T25 flask Germline sample

**Amount to Collect:**
- Tumor sample
  - EDTA whole blood: 5 mL
  - Bone Marrow aspirate: 3 mL

- Germline sample
  - Cultured fibroblasts: Confluent T25 flasks x2
  - Buccal swab: Collect 4-6 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

**Preferred Volume:**
- Tumor sample
  - EDTA whole blood: 5 mL
  - Bone Marrow aspirate: 3 mL

- Germline sample
  - Cultured fibroblasts: Confluent T25 flasks x2
  - Buccal swab: Collect 4-6 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

**Minimum Volume:**
- Tumor sample
  - EDTA whole blood: 2 mL
  - Bone Marrow aspirate: 1 mL

- Germline sample
  - Cultured fibroblasts: Confluent T25 flasks x2
  - Buccal swab: Collect 2-4 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

**Remarks:**
- Buccal swabs are required for new patients to determine the presence of a variant in normal vs. tumor samples. Wipe Cheek multiple times with cytobrush/cotton swabs. Transport in room temperature.
- Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**PROCESSING**

**Test Code:** JMML

**Performing Lab:** Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
- **DO NOT FREEZE** blood or bone marrow samples. Ship to CB as soon as possible.
- Overnight refrigeration prior to transport is acceptable

**Preferred Volume:**
- Tumor sample
  - EDTA whole blood: 5 mL
  - Bone Marrow aspirate: 3 mL

- Germline sample
  - Cultured fibroblasts: Confluent T25 flasks x2
  - Buccal swab: Collect 4-6 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

**Minimum Volume:**
Tumor sample
EDTA whole blood: 2 mL
Bone Marrow aspirate: 1 mL

Germline sample
Cultured fibroblasts: Confluent T25 flasks x2
Buccal swab: Collect 2-4 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

RESULT INTERPRETATION

Reference Interval:
Negative: No clinically significant variants detected.

Additional Information:
An interpretation of this test by a laboratory physician will be automatically performed and billed for separately.

This assay encompasses the DNA sequencing of all exons in each of the following genes: NRAS, KRAS, PTPN11, CBL, NF1, SETBP1, SH2B3, ASXL1, JAK3.
This assay is quantitative and is also intended for minimal residual disease to monitor the allele burden of one or more previously uncovered mutations in a patient. The sensitivity of detecting a somatic variant is 1-2%.

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A characteristic feature of JMML is the presence of a somatic or germline mutation in RAS pathway genes such as NRAS, KRAS, PTPN11, CBL and NF1, which altogether are mutated in about 70% of JMML cases. Mutations outside the RAS pathway have been suggested to constitute secondary mutations that could also lead to the development of JMML and impact on its progression. For example, SETBP1 and JAK3 were found to constitute common targets for secondary mutations. In addition, deleterious mutations in SH2B3 have been associated with the promotion of leukemogenesis, particularly ALL, and are considered as leukemia predisposing variants. Furthermore, heterozygous somatic mutations in ASXL1 may act as tumor suppressor in myeloid malignancies such as AML and CMML, thus assisting in the differential diagnosis of JMML.

Detected variants of known clinical significance in the 9 genes will be reported. In cases when one or two genes of interest are requested, the clinically significant variants of only these genes will be reported.

References

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

ADMINISTRATIVE

CPT Codes:
81450

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
JMML
Performing Lab:
  Medical Genomics - Molecular Diagnostics

Performed:
  Runs are usually setup bi-weekly, day shift only. Run schedule could be modified depending on sample volume.

Methodology:
  Massive Parallel Next Generation DNA Sequencing

Remarks:
  Buccal swabs are required for new patients to determine the presence of a variant in normal vs. tumor samples. Wipe Cheek multiple times with cytobrush/cotton swabs. Transport in room temperature.

  Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

  Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
  Lavender top (EDTA) Blood or bone marrow Buccal swab or T25 flask Germline sample

Amount to Collect:
  Tumor sample
  EDTA whole blood: 5 mL
  Bone Marrow aspirate: 3 mL

  Germline sample
  Cultured fibroblasts: Confluent T25 flasks x2
  Buccal swab: Collect 4-6 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

Sample Type:
  Tumor sample EDTA whole blood or Bone marrow aspirate

  Germline sample Buccal swab or Cultured fibroblasts

Note: Buccal swabs are required for all new patients. (MDX lab 415-514-8488)

Preferred Volume:
  Tumor sample
  EDTA whole blood: 5 mL
  Bone Marrow aspirate: 3 mL

  Germline sample
  Cultured fibroblasts: Confluent T25 flasks x2
  Buccal swab: Collect 4-6 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

Minimum Volume:
  Tumor sample
  EDTA whole blood: 2 mL
  Bone Marrow aspirate: 1 mL

  Germline sample
  Cultured fibroblasts: Confluent T25 flasks x2
  Buccal swab: Collect 2-4 cytobrush/cotton swabs on each side of the mouth, place swabs in transport tubes, 2 swabs per tube.

Specimen Preparation:
  DO NOT FREEZE blood or bone marrow samples. Ship to CB as soon as possible.

  Overnight refrigeration prior to transport is acceptable

Reference Interval:
  Negative: No clinically significant variants detected.

Synonyms:
  - JMML Panel
  - CBL exons 8/9
  - KRAS exons 2/3
  - NRAS exons 2/3
  - PTPN11 exons 3/4/13

Reported:
2-4 weeks

Additional Information:

An interpretation of this test by a laboratory physician will be automatically performed and billed for separately.

This assay encompasses the DNA sequencing of all exons in each of the following genes: NRAS, KRAS, PTPN11, CBL, NF1, SETBP1, SH2B3, ASXL1, JAK3.

This assay is quantitative and is also intended for minimal residual disease to monitor the allele burden of one or more previously uncovered mutations in a patient. The sensitivity of detecting a somatic variant is 1-2%.

Juvenile myelomonocytic leukemia (JMML) is a rare and aggressive pediatric leukemia with poor prognosis. It is characterized by excessive proliferation of myelomonocytes that infiltrate hematopoietic and non-hematopoietic tissues.

While the suspicion of JMML is aided by clinical and hematological criteria, the additional finding of a pathogenic DNA variant previously known to be associated with JMML is often the tipping point in establishing a JMML diagnosis.

A characteristic feature of JMML is the presence of a somatic or germline mutation in RAS pathway genes such as NRAS, KRAS, PTPN11, CBL and NF1, which altogether are mutated in about 70% of JMML cases. Mutations outside the RAS pathway have been suggested to constitute secondary mutations that could also lead to the development of JMML and impact on its progression. For example, SETBP1 and JAK3 were found to constitute common targets for secondary mutations. Furthermore, deleterious mutations in SH2B3 have been associated with the promotion of leukemogenesis, particularly ALL, and are considered as leukemia predisposing variants. Furthermore, heterozygous somatic mutations in ASXL1 may act as tumor suppressor in myeloid malignancies such as AML and CMML, thus assisting in the differential diagnosis of JMML.

Detected variants of known clinical significance in the 9 genes will be reported. In cases when one or two genes of interest are requested, the clinically significant variants of only these genes will be reported.

References

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

CPT Codes:
81450

LDT or Modified FDA:
Yes
### Kappa and Lambda Free light Chains, serum

**FKL**

#### ORDERING

- **Available Stat:** No
- **Performing Lab:** Immunology
- **Performed:** Tuesday, Thursday (day shift)
- **Methodology:** Turbidimetry
- **Reported:** 1-5 days

**Additional Information:**

In serum, the kappa/lambda ratio of whole immunoglobulin molecules is 2:1, whereas the kappa/lambda ratio of free light chains is 1:1.5. The latter is attributed to the occurrence of lambda light chains as dimers whose serum half-life is approximately 3 times longer than that of monomeric kappa light chains. Excess production of kappa or lambda light chains alters the kappa/lambda ratio. Alterations that fall outside the normal range may be attributable to the presence of monoclonal light chains. Serum or urine protein electrophoresis along with immunofixation electrophoresis should be performed to confirm the presence of a monoclonal paraprotein.

Measurement of free light chain concentration in serum can be useful for diagnosis, prognosis, monitoring disease activity and following response to therapy of many disorders, including plasma cell myeloma, macroglobulinemia, Mu heavy chain disease, primary amyloidosis, light chain deposition disease, monoclonal gammopathies, and some cases of lymphoproliferative disorders with paraprotein production such as chronic lymphocytic leukemia.

Chronic infections, chronic inflammatory diseases, and renal insufficiency may be accompanied by a diffuse increase in both kappa and lambda free light chains. Additionally, the serum concentration of free light chains increases with age (particularly over age 60). In each of these cases the kappa/lambda ratio still remains within normal limits.

**Synonyms:**
- K/L
- kappa/lambda

#### COLLECTION

- **Sample Type:** Serum
- **Collect:** Gold top (Red top acceptable)
- **Amount to Collect:** 1 mL blood
- **Preferred Volume:** 0.5 mL serum
- **Minimum Volume:** 0.3 mL serum
- **Remarks:** Avoid hemolysis

**Unacceptable Conditions:**
- Hemolysis, lipemia

#### PROCESSING

- **Test Code:** FKL
Test Group: light chains
Performing Lab: Immunology
Specimen Preparation:
Refrigerate sample
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Hemolysis, lipemia

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:
Kappa light chains: 3.3-19.4 mg/L
Lambda light chains: 5.7-26.3 mg/L
Kappa/Lambda ratio: 0.26-1.65

Additional Information:
In serum, the kappa/lambda ratio of whole immunoglobulin molecules is 2:1, whereas the kappa/lambda ratio of free light chains is 1:1.5. The latter is attributed to the occurrence of lambda light chains as dimers whose serum half-life is approximately 3 times longer than that of monomeric kappa light chains. Excess production of kappa or lambda light chains alters the kappa/lambda ratio. Alterations that fall outside the normal range may be attributable to the presence of monoclonal light chains. Serum or urine protein electrophoresis along with immunofixation electrophoresis should be performed to confirm the presence of a monoclonal paraprotein.

Measurement of free light chain concentration in serum can be useful for diagnosis, prognosis, monitoring disease activity and following response to therapy of many disorders, including plasma cell myeloma, macroglobulinemia, Mu heavy chain disease, primary amyloidosis, light chain deposition disease, monoclonal gammopathies, and some cases of lymphoproliferative disorders with paraprotein production such as chronic lymphocytic leukemia.

Chronic infections, chronic inflammatory diseases, and renal insufficiency may be accompanied by a diffuse increase in both kappa and lambda free light chains. Additionally, the serum concentration of free light chains increases with age (particularly over age 60). In each of these cases the kappa/lambda ratio still remains within normal limits.

ADMINISTRATIVE

CPT Codes:
83883 x2
LOINC Codes:
40844-3

COMPLETE VIEW

Available Stat:
No
Test Code:
FKL
Test Group:
light chains
Performing Lab:
Immunology
Performed:
Tuesday, Thursday (day shift)
Methodology:
Turbidimetry
Remarks:
Avoid hemolysis
Collect:
Gold top (Red top acceptable)
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Hemolysis, lipemia
Specimen Preparation:
Refrigerate sample
Units:
mg/L
Reference Interval:
Kappa light chains: 3.3-19.4 mg/L
Lambda light chains: 5.7-26.3 mg/L
Kappa/Lambda ratio: 0.26-1.65
Synonyms:
• K/L
• kappa/lambda
Reported:
1-5 days
Additional Information:
In serum, the kappa/lambda ratio of whole immunoglobulin molecules is 2:1, whereas the kappa/lambda ratio of free light chains is 1:1.5. The latter is attributed to the occurrence of lambda light chains as dimers whose serum half-life is approximately 3 times longer than that of monomeric kappa light chains. Excess production of kappa or lambda light chains alters the kappa/lambda ratio. Alterations that fall outside the normal range may be attributable to the presence of monoclonal light chains. Serum or urine protein electrophoresis along with immunofixation electrophoresis should be performed to confirm the presence of a monoclonal paraprotein.

Measurement of free light chain concentration in serum can be useful for diagnosis, prognosis, monitoring disease activity and following response to therapy of many disorders, including plasma cell myeloma, macroglobulinemia, Mu heavy chain disease, primary amyloidosis, light chain deposition disease, monoclonal gammapathies, and some cases of lymphoproliferative disorders with paraprotein production such as chronic lymphocytic leukemia.

Chronic infections, chronic inflammatory diseases, and renal insufficiency may be accompanied by a diffuse increase in both kappa and lambda free light chains. Additionally, the serum concentration of free light chains increases with age (particularly over age 60). In each of these cases the kappa/lambda ratio still remains within normal limits.
CPT Codes:
83883 x2
LOINC Codes:
40844-3
Ketones, Qualitative, urine
UA, UAWM

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Performed: Test available 24 hours per day 7 days per week
Methodology: Dipstick
Reported: STAT 1 hour, Routine same or next day.
Additional Information: Ketone bodies include acetoacetate, acetone and beta-hydroxybutyrate; however, this reacts only with acetoacetic acid and does not react with beta-hydroxybutyric acid

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 10 mL urine

PROCESSING

Test Code: UA or UAWM
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume: 10 mL urine

RESULT INTERPRETATION

Reference Interval: Negative
Additional Information: Ketone bodies include acetoacetate, acetone and beta-hydroxybutyrate; however, this reacts only with acetoacetic acid and does not react with beta-hydroxybutyric acid

ADMINISTRATIVE

CPT Codes: 81003

COMPLETE VIEW
Available Stat: Yes

Test Code: UA or UAWM

Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology

Performed: Test available 24 hours per day 7 days per week

Methodology: Dipstick

Collect: Urine cup

Amount to Collect: See preferred volume

Sample Type: Random urine

Preferred Volume: 10 mL urine

Reference Interval: Negative

Reported: STAT 1 hour, Routine same or next day.

Additional Information: Ketone bodies include acetoacetate, acetone and beta-hydroxybutyrate; however, this reacts only with acetoacetic acid and does not react with beta-hydroxybutyric acid

CPT Codes: 81003
Ketosteroids, 17-
17KS

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Colorimetric with modified Zimmerman reaction
Reported:
Test performed Monday-Friday. Turnaround time: 2-4 days.
Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 3.47 (based on MW of DHEA). Includes creatinine as an index of completeness of collection.

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
20 mL urine
Minimum Volume:
10 mL urine
Remarks:
Obtain container from Specimen Receiving.

PROCESSING

Test Code:
17KS
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Record urine volume on test request and on vial containing aliquot. Order Quest # 15201X.
Preferred Volume:
20 mL urine
Minimum Volume:
10 mL urine

RESULT INTERPRETATION

Units:
mg/24 h
Reference Interval:
Age(years) Male Female
0  <1.0 mg/d  <1.0 mg/d
1  <2.0 mg/d  <2.0 mg/d
5  <3.0 mg/d  <3.0 mg/d
9  3.0-10.0 mg/d 3.0-10.0 mg/d
13 5.0-12.0 mg/d 5.0-12.0 mg/d
17 9.0-22.0 mg/d 6.0-15.0 mg/d
21 8.0-20.0 mg/d 6.0-15.0 mg/d

Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 3.47 (based on MW of DHEA). Includes creatinine as an index of completeness of collection.

ADMINISTRATIVE

CPT Codes:
83586-90
LOINC Codes:
6766-0

COMPLETE VIEW

Available Stat:
No
Test Code:
17KS
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Colorimetric with modified Zimmerman reaction
Remarks:
Obtain container from Specimen Receiving.
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Sample Type:
24 hour urine collection
Preferred Volume:
20 mL urine
Minimum Volume:
10 mL urine
Specimen Preparation:
Record urine volume on test request and on vial containing aliquot. Order Quest # 15201X.
Units:
mg/24 h
Reference Interval:

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<td>9.0-22.0 mg/d 6.0-15.0 mg/d</td>
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</tr>
<tr>
<td>21</td>
<td>8.0-20.0 mg/d 6.0-15.0 mg/d</td>
<td></td>
</tr>
</tbody>
</table>
> 21  8.0-20.0 mg/d  6.0-15.0 mg/d

**Reported:**

Test performed Monday-Friday. Turnaround time: 2-4 days.

**Additional Information:**

To convert mg/d to µmol/d (SI units) multiply by 3.47 (based on MW of DHEA). Includes creatinine as an index of completeness of collection.

**CPT Codes:**

83586-90

**LOINC Codes:**

6766-0
KIR Genotype - Low Resolution
HTKIR (Sunquest: ILKIR)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Molecular - SSP
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Synonyms: KIR Typing, KIR Genotyping

COLLECTION

Sample Type: ACD anticoagulated whole blood.
Collect: Yellow top (ACD)
Amount to Collect: 8.5 mL blood
Preferred Volume: 8.5 mL blood
Minimum Volume: 1 mL blood
Remarks: Fill ACD tube completely. Obtain ACD tube from Specimen Receiving. If being collected with other HLA intermediate resolution typing such as HLA-B, HLA-C, HLA-DR, HLA-DQ, etc., 1 tube is sufficient for all tests. Collect additional samples if white blood cell (WBC) count is low (<1,000).
Stability (from collection to initiation): If kept at ambient temperature, can be good for up to 72 hours.
Unacceptable Conditions: WBC count too low (<1,000).

PROCESSING

Test Code: HTKIR (Sunquest: ILKIR)
Test Group: KIR Genotyping
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume: 8.5 mL blood
Minimum Volume: 1 mL blood
Unacceptable Conditions:
WBC count too low (<1,000).

**Stability (from collection to initiation):**

If kept at ambient temperature, can be good for up to 72 hours.

### ADMINISTRATIVE

**CPT Codes:**

81373

### COMPLETE VIEW

**Available Stat:**

Yes

**Test Code:**

HTKIR (Sunquest: ILKIR)

**Test Group:**

KIR Genotyping

**Performing Lab:**

Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**

Yes

**Methodology:**

Molecular - SSP

**Remarks:**

Fill ACD tube completely. Obtain ACD tube from Specimen Receiving. If being collected with other HLA intermediate resolution typing such as HLA-B, HLA-C, HLA-DR, HLA-DQ, etc., 1 tube is sufficient for all tests. Collect additional samples if white blood cell (WBC) count is low (<1,000).

**Collect:**

Yellow top (ACD)

**Amount to Collect:**

8.5 mL blood

**Sample Type:**

ACD anticoagulated whole blood.

**Preferred Volume:**

8.5 mL blood

**Minimum Volume:**

1 mL blood

**Unacceptable Conditions:**

WBC count too low (<1,000).

**Specimen Preparation:**

Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**

- KIR Typing, KIR Genotyping

**Stability (from collection to initiation):**

If kept at ambient temperature, can be good for up to 72 hours.

**Reported:**

Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**CPT Codes:**

81373
Lactate Dehydrogenase, Body Fluid
LDB

ORDERING

Ordering Recommendations:
Not a routinely available test. See ‘Additional information’

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (lactate/NADH)

Reported:
4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Synonyms:
- LD
- LDH

COLLECTION

Sample Type:
Body fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 2 hours. Do not refrigerate or freeze.

PROCESSING

Test Code:
LDB

Test Group:
LD

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Stability (from collection to initiation):
Room temperature 2 hours. Do not refrigerate or freeze.

RESULT INTERPRETATION

Units:
U/L

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

ADMINISTRATIVE

CPT Codes:
83615

LOINC Codes:
2529-6

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
LDB

Test Group:
LD

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (lactate/NADH)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Units:
U/L
Synonyms:
- LD
- LDH

Stability (from collection to initiation):
Room temperature 2 hours. Do not refrigerate or freeze.

Reported:
4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:
83615

LOINC Codes:
2529-6
**Lactate Dehydrogenase, CSF (LDCF)**

### ORDERING

**Ordering Recommendations:**
- Not a routinely available test. See ‘Additional information’

**Available Stat:**
- No

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Spectrophotometric, kinetic (lactate/NADH)

**Reported:**
- 4 hours

**Additional Information:**
- Interpretation requires knowledge of blood level.

**Synonyms:**
- LD
- LDH

### COLLECTION

**Sample Type:**
- CSF

**Collect:**
- CSF tube or sterile collection tube

**Amount to Collect:**
- 3 mL CSF

**Preferred Volume:**
- 0.5 mL CSF

**Minimum Volume:**
- 0.2 mL CSF

**Remarks:**
- Collect serum/plasma in addition if recent blood level is not available for comparison with CSF result. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Stability (from collection to initiation):**
- Room temperature 2 hours. Do not refrigerate or freeze.

### PROCESSING

**Test Code:**
- LDCF

**Test Group:**
- LD

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Preferred Volume:**
- 0.5 mL CSF

**Minimum Volume:**
- 0.2 mL CSF
Stability (from collection to initiation):
Room temperature 2 hours. Do not refrigerate or freeze.

RESULT INTERPRETATION

Units:
U/L

Reference Interval:
The LDH level in CSF is normally about 10% of the serum LDH level


Additional Information:
Interpretation requires knowledge of blood level.

ADMINISTRATIVE

CPT Codes:
83615

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Test Code:
LDCF

Test Group:
LD

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (lactate/NADH)

Remarks:
Collect serum/plasma in addition if recent blood level is not available for comparison with CSF result. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
CSF tube or sterile collection tube

Amount to Collect:
3 mL CSF

Sample Type:
CSF

Preferred Volume:
0.5 mL CSF

Minimum Volume:
0.2 mL CSF

Units:
U/L

Reference Interval:
The LDH level in CSF is normally about 10% of the serum LDH level

Karcher DS, McPherson RA. Chapter 29: Cerebrospinal, synovial, serous body fluids, and alternative specimens. In Henry's Clinical

Synonyms:
- LD
- LDH

Stability (from collection to initiation):
Room temperature 2 hours. Do not refrigerate or freeze.

Reported:
4 hours

Additional Information:
Interpretation requires knowledge of blood level.

CPT Codes:
83615
Lactate Dehydrogenase, Plasma / Serum
LD

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric, kinetic (lactate/NADH)
Reported:
4 hours
Additional Information:
Hemolysis may increase the LDH result.
Certain LDH isoenzymes (LDH-4 and LDH-5) are sensitive to cold exposure and cooling the sample may result in variable decreases in the LDH activity depending on the isoenzyme composition of the sample.
Synonyms:
- LD
- LDH

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Remarks:
Samples should be submitted to the laboratory for processing within 2 hours of collection
Stability (from collection to initiation):
Serum stable 2 days at 2-8°C. Do not freeze. Certain LDH isoenzymes (LDH-4 and LDH-5) are more sensitive to cold. Specimens may have variable decreases in LD activity when stored at 2-8°C, depending on their isoenzyme composition.

PROCESSING

Test Code:
LD
Test Group:
LD
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Specimen Preparation:
Centrifuge and separate serum/plasma from cells. Do not freeze.
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Serum stable 2 days at 2-8°C. Do not freeze. Certain LDH isoenzymes (LD-4 and LD-5) are more sensitive to cold. Specimens may have variable decreases in LD activity when stored at 2-8°C, depending on their isoenzyme composition.

RESULT INTERPRETATION

Units:
U/L

Reference Interval:

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<thead>
<tr>
<th>Age</th>
<th>Male &amp; Female Male</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>&lt;1 month</td>
<td>125-735 U/L</td>
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<tr>
<td>1 month - 11 months</td>
<td>170-450 U/L</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1 year - 4 years</td>
<td>140-304 U/L</td>
<td>142-297 U/L</td>
<td>---</td>
</tr>
<tr>
<td>5 years - 9 years</td>
<td>155-290 U/L</td>
<td>142-261 U/L</td>
<td>---</td>
</tr>
<tr>
<td>10 years - 14 years</td>
<td>115-257 U/L</td>
<td>122-234 U/L</td>
<td>---</td>
</tr>
<tr>
<td>&gt;= 15 years</td>
<td>102-199 U/L</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

2. Normal range for children 1 to less than 15 years old adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range used for pediatric patients >15 years.

Additional Information:
Hemolysis may increase the LDH result.

Certain LDH isoenzymes (LDH-4 and LDH-5) are sensitive to cold exposure and cooling the sample may result in variable decreases in the LDH activity depending on the isoenzyme composition of the sample.

ADMINISTRATIVE

CPT Codes:
83615

LOINC Codes:
2532-0

COMPLETE VIEW

Available Stat:
No

Test Code:
LD

Test Group:
LD

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric, kinetic (lactate/NADH)

Remarks:
Samples should be submitted to the laboratory for processing within 2 hours of collection

Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Specimen Preparation:
Centrifuge and separate serum/plasma from cells. Do not freeze.

Units:
U/L

Reference Interval:

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<th>Age</th>
<th>Male &amp; Female</th>
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<th>Female</th>
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</tbody>
</table>

2. Normal range for children 1 to less than 15 years old adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF. Adult range used for pediatric patients >15 years.

Synonyms:
- LD
- LDH

Stability (from collection to initiation):
Serum stable 2 days at 2-8°C. Do not freeze. Certain LDH isoenzymes (LD-4 and LD-5) are more sensitive to cold. Specimens may have variable decreases in LD activity when stored at 2-8°C, depending on their isoenzyme composition.

Reported:
4 hours

Additional Information:
Hemolysis may increase the LDH result.

Certain LDH isoenzymes (LDH-4 and LDH-5) are sensitive to cold exposure and cooling the sample may result in variable decreases in the LDH activity depending on the isoenzyme composition of the sample.

CPT Codes:
83615
LOINC Codes:
2532-0

Test information subject to change
Lactate, CSF
LACS

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Enzymatic
Reported:
1 hour
Synonyms:
• Lactic acid

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube on ice
Amount to Collect:
1 mL CSF
Preferred Volume:
1 mL CSF
Minimum Volume:
0.6 mL CSF
Remarks:
Chill tube before collection. Deliver sample on ice IMMEDIATELY to laboratory (should be received within 30 min of collection).
Specimen label should contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
On ice 2 hours.

Unacceptable Conditions:
Not delivered on ice or received > 60 min. after collection

PROCESSING

Test Code:
LACS
Test Group:
lactate
Performing Lab:
Parnassus & Mission Bay Chemistry
Specimen Preparation:
If specimen not received on ice, attach comment "Specimen not received on ice, may cause falsely elevated lactate in some cases"
All specimens must be assumed to contain cells and processed immediately.
Provide immediately to Chemistry who will centrifuge and assay sample.
If specimen is collected at Mt. Zion, centrifuge immediately. Aliquot and freeze the sample (-20C) immediately and send to Moffitt/Long
on next scheduled delivery run.

**Preferred Volume:**

1 mL CSF

**Minimum Volume:**

0.6 mL CSF

**Unacceptable Conditions:**

Not delivered on ice or received > 60 min. after collection

**Stability (from collection to initiation):**

On ice 2 hours.

**RESULT INTERPRETATION**

**Units:**

mmol/L

**Reference Interval:**

1.1-2.8 mmol/L

**ADMINISTRATIVE**

**CPT Codes:**

83605

**LOINC Codes:**

2520-5

**COMPLETE VIEW**

**Available Stat:**

Yes

**Test Code:**

LACS

**Test Group:**

lactate

**Performing Lab:**

Parnassus & Mission Bay Chemistry

**Performed:**

Test available 24 hours per day 7 days per week

**Methodology:**

Enzymatic

**Remarks:**

Chill tube before collection. Deliver sample on ice IMMEDIATELY to laboratory (should be received within 30 min of collection).

Specimen label should contain the date the sample was collected and the legible name of the person who collected the sample.

**Collect:**

CSF tube or sterile collection tube on ice

**Amount to Collect:**

1 mL CSF

**Sample Type:**

CSF

**Preferred Volume:**

1 mL CSF

**Minimum Volume:**

0.6 mL CSF

**Unacceptable Conditions:**

Not delivered on ice or received > 60 min. after collection

**Specimen Preparation:**
If specimen not received on ice, attach comment "Specimen not received on ice, may cause falsely elevated lactate in some cases"

All specimens must be assumed to contain cells and processed immediately.

Provide immediately to Chemistry who will centrifuge and assay sample.

If specimen is collected at Mt. Zion, centrifuge immediately. Aliquot and freeze the sample (-20C) immediately and send to Moffitt/Long on next scheduled delivery run.

Units:

mmol/L

Reference Interval:

1.1-2.8 mmol/L

Synonyms:

- Lactic acid

Stability (from collection to initiation):

On ice 2 hours.

Reported:

1 hour

CPT Codes:

83605

LOINC Codes:

2520-5
Lactate, plasma
LACT

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Enzymatic
Reported:
1 hour
Synonyms:
- Lactic acid

COLLECTION

Sample Type:
Fluoride / oxalate whole blood
Collect:
Gray top
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood
Minimum Volume:
0.3 mL blood
Remarks:
Deliver sample immediately to laboratory for processing.
Stability (from collection to initiation):
Room temperature 2 hours.
Unacceptable Conditions:
Serum, collected in non-Gray top tube, or received > 60 minutes after collection

PROCESSING

Test Code:
LACT
Test Group:
lactate
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Specimen Preparation:
Provide immediately to Chemistry section who will centrifuge and assay sample.

If specimen cannot be run at either site centrifuge immediately. Aliquot and freeze the plasma (-20C) immediately and send immediately to other site for testing
Preferred Volume:
1 mL blood
Minimum Volume:
0.3 mL blood
Unacceptable Conditions:
  Serum, collected in non-Gray top tube, or received > 60 minutes after collection

Stability (from collection to initiation):
  Room temperature 2 hours.

RESULT INTERPRETATION

Units:
  mmol/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2 months</td>
<td>1.0-3.5 mmol/L</td>
</tr>
<tr>
<td>3 months - 1 year</td>
<td>1.0-3.3 mmol/L</td>
</tr>
<tr>
<td>2 - 18 years</td>
<td>1.0-2.4 mmol/L</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>0.5-2.2 mmol/L</td>
</tr>
</tbody>
</table>


Critical Values:
  >3.9 mmol/L

ADMINISTRATIVE

CPT Codes:
  83605

LOINC Codes:
  2524-7

COMPLETE VIEW

Available Stat:
  Yes

Test Code:
  LACT

Test Group:
  lactate

Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
  Test available 24 hours per day 7 days per week

Methodology:
  Enzymatic

Remarks:
  Deliver sample immediately to laboratory for processing.

Collect:
  Gray top

Amount to Collect:
  1 mL blood

Sample Type:
  Fluoride / oxalate whole blood

Preferred Volume:
  1 mL blood

Minimum Volume:
0.3 mL blood

Unacceptable Conditions:
- Serum, collected in non-Gray top tube, or received > 60 minutes after collection

Specimen Preparation:
- Provide immediately to Chemistry section who will centrifuge and assay sample.

If specimen cannot be run at either site centrifuge immediately. Aliquot and freeze the plasma (-20C) immediately and send immediately to other site for testing

Units:
- mmol/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 2 months</td>
<td>1.0-3.5 mmol/L</td>
</tr>
<tr>
<td>3 months - 1 year</td>
<td>1.0-3.3 mmol/L</td>
</tr>
<tr>
<td>2 - 18 years</td>
<td>1.0-2.4 mmol/L</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>0.5-2.2 mmol/L</td>
</tr>
</tbody>
</table>


Critical Values:
- >3.9 mmol/L

Synonyms:
- Lactic acid

Stability (from collection to initiation):
- Room temperature 2 hours.

Reported:
- 1 hour

CPT Codes:
- 83605

LOINC Codes:
- 2524-7
# Lactate, whole blood

**NLACT**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>Yes</th>
</tr>
</thead>
</table>
| **Performing Lab:** | Parnassus Chemistry Laboratory  
Mission Bay Hospital Laboratory |
| **Performed:** | Test available 24 hours per day 7 days per week |
| **Methodology:** | Radiometer ABL 800 |
| **Reported:** | Stat 10 min |
| **Synonyms:** | Lactic acid |

## COLLECTION

| **Sample Type:** | Heparinized whole blood (Blood gas syringe only) |
| **Collect:** | ABG syringe containing 100U dry heparin |
| **Amount to Collect:** | 3 mL blood |
| **Preferred Volume:** | 3 mL blood |
| **Minimum Volume:** | 1 mL blood |
| **Remarks:** | Fill syringe completely, remove needle, expel all bubbles and cap. Send immediately to laboratory for testing. Samples may be sent via pneumatic tube to Parnassus Chemistry at station #151 and Mission Bay Blood Gas Lab at station #21. Do not send on ice. |

### Unacceptable Conditions:

Samples submitted > 30 min. after collection, samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume.

## PROCESSING

| **Test Code:** | NLACT |
| **Test Group:** | lactate |
| **Performing Lab:** | Parnassus Chemistry Laboratory  
Mission Bay Hospital Laboratory |
| **Preferred Volume:** | 3 mL blood |
| **Minimum Volume:** | 1 mL blood |

### Unacceptable Conditions:

Samples submitted > 30 min. after collection, samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume.
RESULT INTERPRETATION

Units:
  mmol/L
Reference Interval:
  0.5-2.0 mmol/L
Critical Values:
  >3.9 mmol/L

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  NLACT
Test Group:
  lactate
Performing Lab:
  Parnassus Chemistry Laboratory
  Mission Bay Hospital Laboratory
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Radiometer ABL 800
Remarks:
  Fill syringe completely, remove needle, expel all bubbles and cap. Send immediately to laboratory for testing. Samples may be sent via pneumatic tube to Parnassus Chemistry at station #151 and Mission Bay Blood Gas Lab at station #21. Do not send on ice.
Collect:
  ABG syringe containing 100U dry heparin
Amount to Collect:
  3 mL blood
Sample Type:
  Heparinized whole blood (Blood gas syringe only)
Preferred Volume:
  3 mL blood
Minimum Volume:
  1 mL blood
Unacceptable Conditions:
  Samples submitted > 30 min. after collection. samples with needle attached, containing large bubbles, unlabeled, clotted or insufficient volume.
Units:
  mmol/L
Reference Interval:
  0.5-2.0 mmol/L
Critical Values:
  >3.9 mmol/L
Synonyms:
  • Lactic acid
Reported:
  Stat 10 min
Lactoferrin, stool

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: ELISA
Reported: Test set up 2x per week. Turnaround time 4-7 days.

COLLECTION

Sample Type: Stool
Collect: Urine cup
Amount to Collect:
1 gram stool
10 grams for B&T patients
Preferred Volume:
1 gram stool
10 grams for B&T patients
Minimum Volume:
0.3 gram stool
Remarks: Collect stool in clean dry container. Do not use or add preservatives. Keep sample at room temperature and deliver to laboratory within 48 hours after collection.
Stability (from collection to initiation):
Room temperature 48 hours, refrigerated 48 hours, frozen 3 weeks.
Unacceptable Conditions:
Samples received > 48 hours after collection. Samples submitted in preservative.
Rejection Criteria:
Sample thawed when received. Samples collected in preservative.

PROCESSING

Test Code: LACTOF
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Freeze stool sample. Send to China Basin. Order Quest test # 10156.

For B&T patients order LabCorp test # 823513
Preferred Volume:
1 gram stool
10 grams for B&T patients
Minimum Volume:
0.3 gram stool
Unacceptable Conditions:
   Samples received > 48 hours after collection. Samples submitted in preservative.

Rejection Criteria:
   Sample thawed when received. Samples collected in preservative.

Stability (from collection to initiation):
   Room temperature 48 hours, refrigerated 48 hours, frozen 3 weeks.

RESULT INTERPRETATION

Reference Interval:
   Negative

ADMINISTRATIVE

CPT Codes:
   83630-90

COMPLETE VIEW

Available Stat:
   No

Test Code:
   LACTOF

Performing Lab:
   Quest

Sendout:
   Yes

Methodology:
   ELISA

Remarks:
   Collect stool in clean dry container. Do not use or add preservatives. Keep sample at room temperature and deliver to laboratory within 48 hours after collection.

Collect:
   Urine cup

Amount to Collect:
   1 gram stool
   10 grams for B&T patients

Sample Type:
   Stool

Preferred Volume:
   1 gram stool
   10 grams for B&T patients

Minimum Volume:
   0.3 gram stool

Rejection Criteria:
   Sample thawed when received. Samples collected in preservative.

Unacceptable Conditions:
   Samples received > 48 hours after collection. Samples submitted in preservative.

Specimen Preparation:
   Freeze stool sample. Send to China Basin. Order Quest test # 10156.

For B&T patients order LabCorp test # 823513

Reference Interval:
   Negative

Stability (from collection to initiation):
Room temperature 48 hours, refrigerated 48 hours, frozen 3 weeks.

**Reported:**
- Test set up 2x per week. Turnaround time 4-7 days.

**CPT Codes:**
- 83630-90
Lamotrigine
LAMI

**ORDERING**

Available Stat:  
No

Performing Lab:  
Quest

Methodology:  
LC-MS-MS

Reported:  
Test run 5 days per week. Turnaround 3-5 days

Synonyms:  
- Lamictal

**COLLECTION**

Sample Type:  
Serum

Collect:  
Red top (Gold top NOT acceptable)

Amount to Collect:  
2 mL blood

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.5 mL serum

Remarks:  
Draw 1/2 to 1 hour before next dose at steady state. Do not use gel barrier tube.

Stability (from collection to initiation):  
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.

Unacceptable Conditions:  
Collected in Gold top. Gross hemolyzed or lipemic samples

Rejection Criteria:  
Gross hemolyzed or lipemic samples

**PROCESSING**

Test Code:  
LAMI

Sendout:  
Yes

Performing Lab:  
Quest

Specimen Preparation:  
Freeze sample. Order Quest # 22060

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.5 mL serum

Unacceptable Conditions:  
Collected in Gold top. Gross hemolyzed or lipemic samples
Rejection Criteria:
  Gross hemolyzed or lipemic samples

Stability (from collection to initiation):
  Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks.

RESULT INTERPRETATION

Reference Interval:
  4.0-18.0 µg/mL

ADMINISTRATIVE

CPT Codes:
  80175-90

LOINC Codes:
  6948-4

COMPLETE VIEW

Available Stat:
  No

Test Code:
  LAMI

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  LC-MS-MS

Remarks:
  Draw 1/2 to 1 hour before next dose at steady state. Do not use gel barrier tube.

Collect:
  Red top (Gold top NOT acceptable)

Amount to Collect:
  2 mL blood

Sample Type:
  Serum

Preferred Volume:
  1 mL serum

Minimum Volume:
  0.5 mL serum

Rejection Criteria:
  Gross hemolyzed or lipemic samples

Unacceptable Conditions:
  Collected in Gold top. Gross hemolyzed or lipemic samples

Specimen Preparation:
  Freeze sample. Order Quest # 22060

Reference Interval:
  4.0-18.0 µg/mL

Synonyms:
  • Lamictal

Stability (from collection to initiation):
  Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks.

Reported:
Test run 5 days per week. Turnaround 3-5 days

CPT Codes:
  80175-90

LOINC Codes:
  6948-4
L-asparaginase
MOLT

ORDERING

Performing Lab:
NEXT Molecular Analytics via ARUP

Methodology:
Enzyme Linked Immunosorbent Assay (ELISA)

Reported:
1-4 days

Additional Information:
An asparaginase assay sample submission form must be completed and submitted with the sample. The form is available [here](#).

Additional information about this testing can be found on the vendors website [here](#).

COLLECTION

Sample Type:
Plasma or serum

Collect:
Lavender, red or gold top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.3 mL plasma or serum

Remarks:
An asparaginase assay sample submission form must be completed and submitted with the sample. The form is available [here](#).

Additional information about this testing can be found on the vendors website [here](#).

Stability (from collection to initiation):
5 days refrigerated; indefinite frozen

Storage/Transport Temperature:
Refrigerated

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
NEXT Molecular Analytics via ARUP

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.3 mL plasma or serum

Stability (from collection to initiation):
5 days refrigerated; indefinite frozen

Test information subject to change
Printed 06/07/19
Storage/Transport Temperature:
Refrigerated

RESULT INTERPRETATION

Additional Information:
An asparaginase assay sample submission form must be completed and submitted with the sample. The form is available here.

Additional information about this testing can be found on the vendors website here.

ADMINISTRATIVE

CPT Codes:
82657

COMPLETE VIEW

Test Code:
MOLT
Performing Lab:
NEXT Molecular Analytics via ARUP
Sendout:
Yes
Methodology:
Enzyme Linked Immunosorbent Assay (ELISA)

Remarks:
An asparaginase assay sample submission form must be completed and submitted with the sample. The form is available here.

Additional information about this testing can be found on the vendors website here.

Collect:
Lavender, red or gold top
Amount to Collect:
1 mL blood
Sample Type:
Plasma or serum
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.3 mL plasma or serum
Storage/Transport Temperature:
Refrigerated
Stability (from collection to initiation):
5 days refrigerated; indefinite frozen
Reported:
1-4 days
Additional Information:
An asparaginase assay sample submission form must be completed and submitted with the sample. The form is available here.

Additional information about this testing can be found on the vendors website here.

CPT Codes:
LCM Virus Antibody
LCM

ORDERING

Available Stat: No
Performing Lab: San Francisco Public Health Laboratory
Methodology: IFA
Reported: Test run Wednesday. Turnaround time: 1-2 weeks
Additional Information: Available from the State Viral and Rickettsial Diseases Lab via the local health department. See also entry for Viral Serology, and consult Microbiology regarding culture.

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Submit paired sera, one collected within 1 wk of onset of illness and another 2-3 weeks later. Tests are NOT performed until convalescent serum is received. The physician must complete a form for Special Serology, Click here for form
Stability (from collection to initiation): Refrigerated 2 weeks, frozen 1 month
Rejection Criteria: Sample received at room temperature

PROCESSING

Test Code: LCM
Sendout: Yes
Performing Lab: San Francisco Public Health Laboratory
Specimen Preparation: Refrigerate sample
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Rejection Criteria: Sample received at room temperature
Stability (from collection to initiation):
RESULT INTERPRETATION

Units:
- Titer

Reference Interval:
- Negative titer < 8

Additional Information:
- Available from the State Viral and Rickettsial Diseases Lab via the local health department. See also entry for Viral Serology, and consult Microbiology regarding culture.

COMPLETE VIEW

Available Stat:
- No

Test Code:
- LCM

Performing Lab:
- San Francisco Public Health Laboratory

Sendout:
- Yes

Methodology:
- IFA

Remarks:
- Submit paired sera, one collected within 1 wk of onset of illness and another 2-3 weeks later. Tests are NOT performed until convalescent serum is received. The physician must complete a form for Special Serology, [Click here for form]

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Rejection Criteria:
- Sample received at room temperature

Specimen Preparation:
- Refrigerate sample

Units:
- Titer

Reference Interval:
- Negative titer < 8

Stability (from collection to initiation):
- Refrigerated 2 weeks, frozen 1 month

Reported:
- Test run Wednesday. Turnaround time: 1-2 weeks

Additional Information:
- Available from the State Viral and Rickettsial Diseases Lab via the local health department. See also entry for Viral Serology, and consult Microbiology regarding culture.
Lead, 24 hour urine
PBUR

ORDERING

Available Stat:  
No
Performing Lab:  
Quest
Methodology:  
Inductively-Coupled Plasma/Mass Spectrometry
Reported:  
Test run Tuesday-Saturday. Turnaround: 2-5 days.
Additional Information:  
The results are reported as the lead concentration (ug/L) and in the amount of lead in the total volume (ug/TV). To convert \( \mu g/L \) to \( \mu mol/L \) (SI units), multiply by 0.00483.
Synonyms:  
- Pb
- heavy metal toxicity
- heavy metal poisoning
- heavy metals

COLLECTION

Sample Type:  
24 hour urine collection
Collect:  
Acid washed 24 hour urine collection container
Amount to Collect:  
Entire 24 hour urine output
Preferred Volume:  
7 mL urine
Minimum Volume:  
3 mL urine
Remarks:  
Refrigerate container during collection.
Unacceptable Conditions:  
Container not refrigerated during collection.

PROCESSING

Test Code:  
PBUR
Test Group:  
Lead
Sendout:  
Yes
Performing Lab:  
Quest
Specimen Preparation:  
Record total volume of urine collected on requisition. Follow detailed processing instructions for trace metal analysis. Mix urine received and aliquot 7 mL. Refrigerate. Order Quest # 8151N
Preferred Volume:
**RESULT INTERPRETATION**

Units:
- µg/L (mcg/L)

**Reference Interval:**
- <80 µg/L

**Additional Information:**
- The results are reported as the lead concentration (ug/L) and in the amount of lead in the total volume (ug/TV). To convert µg/L to µmol/L (SI units), multiply by 0.00483.

**ADMINISTRATIVE**

**CPT Codes:**
- 83655-90

**LOINC Codes:**
- 20625-0

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- PBUR

**Test Group:**
- Lead

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Inductively-Coupled Plasma/Mass Spectrometry

**Remarks:**
- Refrigerate container during collection.

**Collect:**
- Acid washed 24 hour urine collection container

**Amount to Collect:**
- Entire 24 hour urine output

**Sample Type:**
- 24 hour urine collection

**Preferred Volume:**
- 7 mL urine

**Minimum Volume:**
- 3 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection.

**Specimen Preparation:**
- Record total volume of urine collected on requisition. Follow detailed processing instructions for trace metal analysis. Mix urine received and aliquot 7 mL. Refrigerate. Order Quest # 8151N

**Units:**
µg/L (mcg/L)

Reference Interval:

<80 µg/L

Synonyms:
- Pb
- heavy metal toxicity
- heavy metal poisoning
- heavy metals

Reported:
Test run Tuesday-Saturday. Turnaround: 2-5 days.

Additional Information:
The results are reported as the lead concentration (µg/L) and in the amount of lead in the total volume (µg/TV). To convert µg/L to µmol/L (SI units), multiply by 0.00483.

CPT Codes:
83655-90

LOINC Codes:
20625-0
Lead, Blood (Capillary)
PBMC1

ORDERING

Ordering Recommendations:
Recommended for routine testing for lead exposure in pediatric populations. Confirm elevated results with Lead, Blood (Venous) (0020098).

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Inductively Coupled Plasma-Mass Spectrometry

Reported:
1-3 days

Synonyms:
- BLL
- Capillary blood level
- Lead (Pediatric)
- Pb
- Pb, Blood
- Pb, Pediatric
- Pb, Whole Blood

COLLECTION

Patient Preparation:
Clean puncture site well with soap and water before collection procedure begins.

Sample Type:
Whole blood (micro-lavendar top)

Collect:
Lavender Pediatric (EDTA).

Amount to Collect:
0.5 mL

Preferred Volume:
0.5 mL

Minimum Volume:
0.3 mL

Remarks:
Trace Elements requisition form may be required (ARUP form #32990).

Stability (from collection to initiation):
Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable

Storage/Transport Temperature:
Room temperature. Also acceptable: Refrigerated.

Unacceptable Conditions:
Specimens collected in tubes other than Lavender Pediatric (EDTA). Specimens transported in tubes other than trace-element free transport tubes or Lavender Pediatric (EDTA) tubes. Heparin anticoagulant. Clotted specimens.
Venous whole blood, refer to Lead, Blood (Venous) 0020098.

PROCESSING
Test Code:
PBMC1
ARUP Test Code:
0020745
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Invert specimen 10 times to prevent clot formation. Transport 0.5 mL whole blood. (Min: 0.3 mL)
Preferred Volume:
0.5 mL
Minimum Volume:
0.3 mL
Unacceptable Conditions:
Specimens collected in tubes other than Lavender Pediatric (EDTA). Specimens transported in tubes other than trace-element free transport tubes or Lavender Pediatric (EDTA) tubes. Heparin anticoagulant. Clotted specimens.
Venous whole blood, refer to Lead, Blood (Venous) 0020098.
Stability (from collection to initiation):
Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable
Storage/Transport Temperature:
Room temperature. Also acceptable: Refrigerated.

RESULT INTERPRETATION

Reference Interval:
0.0-4.9 µg/dL
Interpretive Data:
Elevated results may be due to skin or collection-related contamination, including the use of a noncertified lead-free collection/transport tube. If contamination concerns exist due to elevated levels of blood lead, confirmation with a venous specimen collected in a certified lead-free tube is recommended.
Repeat testing is recommended prior to initiating chelation therapy or conducting environmental investigations of potential lead sources. Repeat testing collections should be performed using a venous specimen collected in a certified lead-free collection tube.

Information sources for reference intervals and interpretive comments include the "CDC Response to the 2012 Advisory Committee on Childhood Lead Poisoning Prevention Report" and the "Recommendations for Medical Management of Adult Lead Exposure, Environmental Health Perspectives, 2007." Thresholds and time intervals for retesting, medical evaluation, and response vary by state and regulatory body. Contact your State Department of Health and/or applicable regulatory agency for specific guidance on medical management recommendations.

<table>
<thead>
<tr>
<th>Age</th>
<th>Concentration</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>All ages</td>
<td>5-9.9 µg/dL</td>
<td>Adverse health effects are possible, particularly in children under 6 years of age and pregnant women. Discuss health risks associated with continued lead exposure. For children and women who are or may become pregnant, reduce lead exposure.</td>
</tr>
<tr>
<td>All ages</td>
<td>10-19.9 µg/dL</td>
<td>Reduced lead exposure and increased biological monitoring are recommended.</td>
</tr>
<tr>
<td>All ages</td>
<td>20-69.9 µg/dL</td>
<td>Removal from lead exposure and prompt medical evaluation are recommended. Consider chelation therapy when concentrations exceed 50 µg/dL and symptoms of lead toxicity are present.</td>
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<tr>
<td>Less than 19 years of age</td>
<td>Greater than 44.9 µg/dL</td>
<td>Critical. Immediate medical evaluation is recommended. Consider chelation therapy when symptoms of lead toxicity are present.</td>
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<td>Critical. Immediate medical evaluation is recommended. Consider chelation therapy when symptoms of lead toxicity are present.</td>
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</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
Ordering Recommendations:
Recommended for routine testing for lead exposure in pediatric populations. Confirm elevated results with Lead, Blood (Venous) (0020098).

Test Code:
PBM1

ARUP Test Code:
0020745

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Inductively Coupled Plasma-Mass Spectrometry

Patient Preparation:
Clean puncture site well with soap and water before collection procedure begins.

Remarks:
Trace Elements requisition form may be required (ARUP form #32990).

Collect:
Lavender Pediatric (EDTA).

Amount to Collect:
0.5 mL

Sample Type:
Whole blood (micro-lavendar top)

Preferred Volume:
0.5 mL

Minimum Volume:
0.3 mL

Unacceptable Conditions:
Specimens collected in tubes other than Lavender Pediatric (EDTA). Specimens transported in tubes other than trace-element free transport tubes or Lavender Pediatric (EDTA) tubes. Heparin anticoagulant. Clotted specimens. Venous whole blood, refer to Lead, Blood (Venous) 0020098.

Specimen Preparation:
Invert specimen 10 times to prevent clot formation. Transport 0.5 mL whole blood. (Min: 0.3 mL)

Reference Interval:
0.0-4.9 µg/dL

Interpretive Data:
Elevated results may be due to skin or collection-related contamination, including the use of a noncertified lead-free collection/transport tube. If contamination concerns exist due to elevated levels of blood lead, confirmation with a venous specimen collected in a certified lead-free tube is recommended.

Repeat testing is recommended prior to initiating chelation therapy or conducting environmental investigations of potential lead sources. Repeat testing collections should be performed using a venous specimen collected in a certified lead-free collection tube.

Information sources for reference intervals and interpretive comments include the "CDC Response to the 2012 Advisory Committee on Childhood Lead Poisoning Prevention Report" and the "Recommendations for Medical Management of Adult Lead Exposure, Environmental Health Perspectives, 2007." Thresholds and time intervals for retesting, medical evaluation, and response vary by state and regulatory body. Contact your State Department of Health and/or applicable regulatory agency for specific guidance on medical management recommendations.
### Age Concentration Comment

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#### Synonyms:
- BLL
- Capillary blood level
- Lead (Pediatric)
- Pb
- Pb, Blood
- Pb, Pediatric
- Pb, Whole Blood

#### Storage/Transport Temperature:
- Room temperature. Also acceptable: Refrigerated.

#### Stability (from collection to initiation):
- Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable

#### Reported:
- 1-3 days

#### CPT Codes:
- 83655

#### LOINC:
- 10368-9

Test information subject to change.
Lead, Blood (Venous)

ORDERING

Ordering Recommendations:
Recommended for routine testing for lead exposure. For occupational exposure, consider Lead, Industrial Exposure Panel, Adults (0025016).

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Inductively Coupled Plasma-Mass Spectrometry

Reported:
1-2 days

Synonyms:
- BLL
- Lead (Adult)
- Pb
- Pb, Blood
- Pb, Whole Blood
- Venous blood level

COLLECTION

Sample Type:
Whole blood

Collect:
Royal blue (K₂EDTA or Na₂EDTA) or tan (K₂EDTA).

Amount to Collect:
- Royal blue: 7 mL blood
- Tan: 3 mL blood

Preferred Volume:
- Royal blue: 7 mL blood
- Tan: 3 mL blood

Minimum Volume:
- Royal blue: 0.5 mL blood
- Tan: 0.5 mL blood

Remarks:
Trace Elements requisition form may be required (ARUP form #32990).

Stability (from collection to initiation):
- Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable

Storage/Transport Temperature:
Room temperature. Also acceptable: Refrigerated.

Unacceptable Conditions:
- Serum. Specimens collected in tubes other than Royal Blue (K₂EDTA or Na₂EDTA) or tan (K₂EDTA). Heparinized or clotted specimens. Capillary pediatric EDTA collection tubes, refer to Lead, Blood (Capillary) 0020745.

PROCESSING

Test Code:
PBM
ARUP Test Code:
0020098
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transport 7 mL whole blood (royal blue). (Min: 0.5 mL) OR Transport 3 mL whole blood (tan). (Min: 0.5 mL)
Additional Processing Instructions:
NOTE: Pediatric venous specimens are an acceptable sample for this test.
Preferred Volume:
Royal blue: 7 mL blood
Tan: 3 mL blood
Minimum Volume:
Royal blue: 0.5 mL blood
Tan: 0.5 mL blood
Unacceptable Conditions:
Serum. Specimens collected in tubes other than Royal Blue (K₂EDTA or Na₂EDTA) or tan (K₂EDTA). Heparinized or clotted specimens. Capillary pediatric EDTA collection tubes, refer to Lead, Blood (Capillary) 0020745.
Stability (from collection to initiation):
Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable
Storage/Transport Temperature:
Room temperature. Also acceptable: Refrigerated.

RESULT INTERPRETATION

Reference Interval:
0.0-4.9 µg/dL
Interpretive Data:
Elevated results may be due to skin or collection-related contamination, including the use of a noncertified lead-free tube. If contamination concerns exist due to elevated levels of blood lead, confirmation with a second specimen collected in a certified lead-free tube is recommended.

Information sources for reference intervals and interpretive comments include the "CDC Response to the 2012 Advisory Committee on Childhood Lead Poisoning Prevention Report" and the "Recommendations for Medical Management of Adult Lead Exposure, Environmental Health Perspectives, 2007." Thresholds and time intervals for retesting, medical evaluation, and response vary by state and regulatory body. Contact your State Department of Health and/or applicable regulatory agency for specific guidance on medical management recommendations.

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ADMINISTRATIVE

CPT Codes:
83655
Ordering Recommendations:
Recommended for routine testing for lead exposure. For occupational exposure, consider Lead, Industrial Exposure Panel, Adults (0025016).

Test Code:
PBM

ARUP Test Code:
0020098

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Inductively Coupled Plasma-Mass Spectrometry

Remarks:
Trace Elements requisition form may be required (ARUP form #32990).

Collect:
Royal blue (K\textsubscript{2}EDTA or Na\textsubscript{2}EDTA) or tan (K\textsubscript{2}EDTA).

Amount to Collect:
Royal blue: 7 mL blood
Tan: 3 mL blood

Sample Type:
Whole blood

Preferred Volume:
Royal blue: 7 mL blood
Tan: 3 mL blood

Minimum Volume:
Royal blue: 0.5 mL blood
Tan: 0.5 mL blood

Unacceptable Conditions:
Serum. Specimens collected in tubes other than Royal Blue (K\textsubscript{2}EDTA or Na\textsubscript{2}EDTA) or tan (K\textsubscript{2}EDTA). Heparinized or clotted specimens. Capillary pediatric EDTA collection tubes, refer to Lead, Blood (Capillary) 0020745.

Specimen Preparation:
Transport 7 mL whole blood (royal blue). (Min: 0.5 mL) OR Transport 3 mL whole blood (tan). (Min: 0.5 mL)

Additional Processing Instructions:
NOTE: Pediatric venous specimens are an acceptable sample for this test.

Reference Interval:
0.0-4.9 µg/dL

Interpretive Data:
Elevated results may be due to skin or collection-related contamination, including the use of a noncertified lead-free tube. If contamination concerns exist due to elevated levels of blood lead, confirmation with a second specimen collected in a certified lead-free tube is recommended.

Information sources for reference intervals and interpretive comments include the “CDC Response to the 2012 Advisory Committee on Childhood Lead Poisoning Prevention Report” and the “Recommendations for Medical Management of Adult Lead Exposure, Environmental Health Perspectives, 2007.” Thresholds and time intervals for retesting, medical evaluation, and response vary by state and regulatory body. Contact your State Department of Health and/or applicable regulatory agency for specific guidance on medical management recommendations.

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**Synonyms:**
- BLL
- Lead (Adult)
- Pb
- Pb, Blood
- Pb, Whole Blood
- Venous blood level

**Storage/Transport Temperature:**
- Room temperature. Also acceptable: Refrigerated.

**Stability (from collection to initiation):**
- Ambient: Indefinitely; Refrigerated: Indefinitely; Frozen: Unacceptable

**Reported:**
- 1-2 days

**CPT Codes:**
- 83655
Lead, random urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively-Coupled Plasma/Mass Spectrometry
Reported:
Performed 5 days per week. Turn around 6-8 days.
Synonyms:
- Pb
- heavy metal toxicity
- heavy metal poisoning
- heavy metals

COLLECTION

Sample Type:
Random urine (2nd void)
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
7 mL urine
Minimum Volume:
3 mL urine
Remarks:
Collect second morning void urine.
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.

PROCESSING

Test Code:
PBURR
Test Group:
Lead
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate aliquot. Order Quest test # 56762P
Preferred Volume:
7 mL urine
Minimum Volume:
3 mL urine
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.

RESULT INTERPRETATION

Units:
µg/g Creatinine (mcg/g Creatinine)

Reference Interval:
Nonexposed: < 10 µg/g creatinine

ADMINISTRATIVE

CPT Codes:
82570-90, 83655-90

LOINC Codes:
13466-8

COMPLETE VIEW

Available Stat:
No

Test Code:
PBURR

Test Group:
Lead

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively-Coupled Plasma/Mass Spectrometry

Remarks:
Collect second morning void urine.

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine (2nd void)

Preferred Volume:
7 mL urine

Minimum Volume:
3 mL urine

Specimen Preparation:
Refrigerate aliquot. Order Quest test # 56762P

Units:
µg/g Creatinine (mcg/g Creatinine)

Reference Interval:
Nonexposed: < 10 µg/g creatinine

Synonyms:
• Pb
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks.

Reported:
- Performed 5 days per week. Turn around 6-8 days.

CPT Codes:
- 82570-90, 83655-90

LOINC Codes:
- 13466-8
### Leflunomide

**LEFL**

**ORDERING**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Quest</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>LC/MS</td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
<td>7 days</td>
</tr>
</tbody>
</table>

**Additional Information:**

This test reports the active metabolite of Teriflunomide. Women who are being treated with Leflunomide and desire to become pregnant it is recommended that the plasma Teriflunomide levels be less than 20 ng/mL by two separate tests taken at least 14 days apart. Mean steady state trough plasma concentrations of Teriflunomide from patients on daily regimen of 5,10 or 25 mg of Leflunomide were 8,800, 18,000 and 63,000 ng/mL respectively. The minimum effective concentration is reported to be 13,000 ng/mL.

This test was developed, validated and performed by National Medical Services Inc. 3701 Welsh Road, Willow Grove, PA. 19090 via Quest Nichols Diagnostics.

**Synonyms:**
- Teriflunomide

**COLLECTION**

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collect:</strong></td>
<td>Red top (Gold top NOT acceptable)</td>
</tr>
<tr>
<td><strong>Amount to Collect:</strong></td>
<td>2 mL blood</td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>1 mL serum</td>
</tr>
<tr>
<td><strong>Unacceptable Conditions:</strong></td>
<td>Collected in Gold top</td>
</tr>
</tbody>
</table>

**PROCESSING**

<table>
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<th>Test Code:</th>
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<tr>
<td><strong>Sendout:</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Quest</td>
</tr>
<tr>
<td><strong>Specimen Preparation:</strong></td>
<td>Refrigerate sample. Order Quest test #18865</td>
</tr>
<tr>
<td><strong>Preferred Volume:</strong></td>
<td>1 mL serum</td>
</tr>
<tr>
<td><strong>Unacceptable Conditions:</strong></td>
<td>Collected in Gold top</td>
</tr>
</tbody>
</table>

**RESULT INTERPRETATION**

Printed 06/07/19
Test information subject to change
## Additional Information:

This test reports the active metabolite of Teriflunomide. Women who are being treated with Leflunomide and desire to become pregnant it is recommended that the plasma Teriflunomide levels be less than 20 ng/mL by two separate tests taken at least 14 days apart. Mean steady state trough plasma concentrations of Teriflunomide from patients on daily regimen of 5, 10 or 25 mg of Leflunomide were 8,800, 18,000 and 63,000 ng/mL respectively. The minimum effective concentration is reported to be 13,000 ng/mL.

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<td>LOINC Codes:</td>
<td>38901-5</td>
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<tr>
<td>Units:</td>
<td>ng/mL</td>
</tr>
<tr>
<td>Reference Interval:</td>
<td>See Additional Information</td>
</tr>
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<td>Synonyms:</td>
<td>• Teriflunomide</td>
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<td>Reported:</td>
<td>7 days</td>
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</table>

### Additional Information:

This test reports the active metabolite of Teriflunomide. Women who are being treated with Leflunomide and desire to become pregnant it is recommended that the plasma Teriflunomide levels be less than 20 ng/mL by two separate tests taken at least 14 days apart. Mean steady state trough plasma concentrations of Teriflunomide from patients on daily regimen of 5, 10 or 25 mg of Leflunomide were 8,800, 18,000 and 63,000 ng/mL respectively. The minimum effective concentration is reported to be 13,000 ng/mL.
18,000 and 63,000 ng/mL respectively. The minimum effective concentration is reported to be 13,000 ng/mL.

This test was developed, validated and performed by National Medical Services Inc. 3701 Welsh Road, Willow Grove, PA. 19090 via Quest Nichols Diagnostics.

**CPT Codes:**
82542-90

**LOINC Codes:**
38901-5
Legionella Culture

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Daily, day and evening shifts
Methodology: Culture
Reported: Up to 14 days
Additional Information: Culture is the gold standard and 100% specific, but sensitivity is less than 75%. Inadequate specimens, poor growth characteristics and prior antibiotic use will decrease culture yield.

The sensitivity of PCR tests are estimated to be 80 to 100% for lower respiratory tract specimens and the specificity is >90%.

Order Legionella Culture in conjunction with Legionella PCR test for optimal laboratory diagnosis of Legionella infections.

Legionella Urinary Antigen detects only serotype 1, which accounts for less than half of infections seen at UCSF.

Synonyms:
- Bacterial culture
- Legionnaires disease

COLLECTION

Sample Type: Bronchial wash/lavage, endotrachael aspirate, sputum, unfixed tissue, nasopharyngeal swab
Collect:
- Nasopharyngeal swab: Flocked swab in Universal Transport Medium (UTM), or swab in charcoal transport medium. Other samples: Sterile, leak-proof container
Remarks:
- Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Stability (from collection to initiation):
- Refrigerated 24 hours

PROCESSING

Test Code: P125
Test Group: Legionella
Performing Lab: Microbiology
Stability (from collection to initiation):
- Refrigerated 24 hours

RESULT INTERPRETATION
Reference Interval:
Negative

Critical Values:
Positive culture

Additional Information:
Culture is the gold standard and 100% specific, but sensitivity is less than 75%. Inadequate specimens, poor growth characteristics and prior antibiotic use will decrease culture yield.

The sensitivity of PCR tests are estimated to be 80 to 100% for lower respiratory tract specimens and the specificity is >90%.

Order Legionella Culture in conjunction with Legionella PCR test for optimal laboratory diagnosis of Legionella infections.

Legionella Urinary Antigen detects only serotype 1, which accounts for less than half of infections seen at UCSF.

ADMINISTRATIVE

CPT Codes:
87081

LOINC Codes:
593-4

COMPLETE VIEW

Available Stat:
No

Test Code:
P125

Test Group:
Legionella

Performing Lab:
Microbiology

Performed:
Daily, day and evening shifts

Methodology:
Culture

Remarks:
Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Collect:
Nasopharyngeal swab: Flocked swab in Universal Transport Medium(UTM), or swab in charcoal transport medium. Other samples: Sterile, leak-proof container

Sample Type:
Bronchial wash/lavage, endotrachael aspirate, sputum, unfixed tissue, nasopharyngeal swab

Reference Interval:
Negative

Critical Values:
Positive culture

Synonyms:
- Bacterial culture
- Legionnaires disease

Stability (from collection to initiation):
Refrigerated 24 hours

Reported:
Up to 14 days

**Additional Information:**

Culture is the gold standard and 100% specific, but sensitivity is less than 75%. Inadequate specimens, poor growth characteristics and prior antibiotic use will decrease culture yield.

The sensitivity of PCR tests are estimated to be 80 to 100% for lower respiratory tract specimens and the specificity is >90%.

Order Legionella Culture in conjunction with Legionella PCR test for optimal laboratory diagnosis of Legionella infections.

Legionella Urinary Antigen detects only serotype 1, which accounts for less than half of infections seen at UCSF.

**CPT Codes:**

87081

**LOINC Codes:**

593-4
Legionella DNA
P356

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
Real time PCR
Reported:
3-5 days
Additional Information:
This test detects and differentiates between Legionella pneumophila and non-pneumophila Legionella spp. DNA in clinical specimens.
Synonyms:
• Legionnaires disease

COLLECTION

Sample Type:
Bronchial wash/lavage, endotrachael aspirate, sputum, nasopharyngeal swab
Collect:
Nasopharyngeal swab: Flocked swab in Universal Transport Medium (UTM)
Other samples: Sterile leak-proof container
Amount to Collect:
Nasopharyngeal swab: 1 flocked swab
Other samples: 1 mL
Preferred Volume:
Nasopharyngeal swab: 1 flocked swab
Other samples: 1 mL
Minimum Volume:
Nasopharyngeal swab: 1 flocked swab
Other samples: 0.5 mL
Remarks:
Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

PROCESSING

Test Code:
P356
Test Group:
Legionella
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Refrigerate sample and ship to CB refrigerated. Freeze specimen at -70°C upon receipt at China Basin and ship frozen to reference lab.
Preferred Volume:
Nasopharyngeal swab: 1 flocked swab
?Other samples: 1 mL

Minimum Volume:
Nasopharyngeal swab: 1 flocked swab
?Other samples: 0.5 mL

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
Not detected

Critical Values:
Detected

Additional Information:
This test detects and differentiates between Legionella pneumophila and non-pneumophila Legionella spp. DNA in clinical specimens.

ADMINISTRATIVE

CPT Codes:
87541-90, 87798-90

LOINC Codes:
21363-7, 31208-2, 49616-6

COMPLETE VIEW

Available Stat:
No

Test Code:
P356

Test Group:
Legionella

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Real time PCR

Remarks:
Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Collect:
Nasopharyngeal swab: Flocked swab in Universal Transport Medium (UTM)
Other samples: Sterile leak-proof container

Amount to Collect:
Nasopharyngeal swab: 1 flocked swab
Other samples: 1 mL

Sample Type:
Bronchial wash/lavage, endotrachael aspirate, sputum, nasopharyngeal swab

Preferred Volume:
Nasopharyngeal swab: 1 flocked swab
?Other samples: 1 mL

Minimum Volume:
Nasopharyngeal swab: 1 flocked swab
Specimen Preparation:
Refrigerate sample and ship to CB refrigerated. Freeze specimen at -70C upon receipt at China Basin and ship frozen to reference lab.

Reference Interval:
Not detected

Critical Values:
Detected

Synonyms:
Legionnaires disease

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen 1 month

Reported:
3-5 days

Additional Information:
This test detects and differentiates between Legionella pneumophila and non-pneumophila Legionella spp. DNA in clinical specimens.

CPT Codes:
87541-90, 87798-90

LOINC Codes:
21363-7, 31208-2, 49616-6
Legionella pneumophila urinary antigen

**ORDERING**

*Available Stat:*
  
  No

*Performing Lab:*
  
  Quest

*Methodology:*
  
  EIA

*Reported:*
  
  Set up 5 days per week. Turnaround time 4-6 days.

*Additional Information:*
  
  Legionella pneumophila serogroup 1 antigen can be detected in urine within 2-3 days of infection and may persist even after treatment.

  Only a small portion of Legionella infections are due to serogroup 1. **This assay does not detect other Legionella species or serogroups.** Therefore a negative test cannot be used to exclude infection.

  Regardless of whether a urine antigen test is used, culture of respiratory specimen should always be performed because culture diagnosis continues to be the most sensitive and specific means to diagnose Legionnaire’s Disease

*Synonyms:*
  
  ● Legionnaires disease

**COLLECTION**

*Sample Type:*
  
  Random urine

*Collect:*
  
  Urine cup

*Amount to Collect:*
  
  10 mL

*Preferred Volume:*
  
  1 mL urine

*Minimum Volume:*
  
  0.5 mL urine

*Stability (from collection to initiation):*
  
  Room temperature 8 hours, refrigerated 2 weeks, frozen at -20C 1 month.

**PROCESSING**

*Test Code:*
  
  LEGAU

*Test Group:*
  
  Legionella

*Sendout:*
  
  Yes

*Performing Lab:*
  
  Quest

*Specimen Preparation:*
  
  Order Quest test # 8856

*Preferred Volume:*
  
  1 mL urine

*Minimum Volume:*
  
  0.5 mL urine
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Legionella pneumophila serogroup 1 antigen can be detected in urine within 2-3 days of infection and may persist even after treatment.

Only a small portion of Legionella infections are due to serogroup 1. This assay does not detect other Legionella species or serogroups. Therefore a negative test cannot be used to exclude infection.

Regardless of whether a urine antigen test is used, culture of respiratory specimen should always be performed because culture diagnosis continues to be the most sensitive and specific means to diagnose Legionnaire’s Disease

ADMINISTRATIVE

CPT Codes:
87449-90

COMPLETE VIEW

Available Stat:
No
Test Code:
LEGAU
Test Group:
Legionella
Performing Lab:
Quest
Sendout:
Yes
Methodology:
EIA
Collect:
Urine cup
Amount to Collect:
10 mL
Sample Type:
Random urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Specimen Preparation:
Order Quest test # 8856
Reference Interval:
Negative

Synonyms:
- Legionnaires disease

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
Set up 5 days per week. Turnaround time 4-6 days.
Additional Information:

Legionella pneumophila serogroup 1 antigen can be detected in urine within 2-3 days of infection and may persist even after treatment.

Only a small portion of Legionella infections are due to serogroup 1. This assay does not detect other Legionella species or serogroups. Therefore a negative test cannot be used to exclude infection.

Regardless of whether a urine antigen test is used, culture of respiratory specimen should always be performed because culture diagnosis continues to be the most sensitive and specific means to diagnose Legionnaire's Disease

CPT Codes:
87449-90
Leishmania Exam
P403L

ORDERING

Approval Required:
No, but contact parasitologist in Microbiology (x31268) prior to collecting samples

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Monday-Thursday before 12:30 pm

Methodology:
Microscopy (Giema stain of smears)

Reported:
Giemsa smears 1-3 days PCR/Sequencing 6 weeks

Additional Information:
Lesion biopsies and aspirates can be examined by stain and/or culture in patients with cutaneous or mucocutaneous leishmaniasis. Biopsy of liver, spleen, or lymph node, or bone marrow can be examined by stain and/or culture in visceral leishmaniasis (Kala azar). A portion of any tissue sample should also be submitted to Pathology.

Physician may also request Microbiology to send sample to CDC for PCR and DNA sequencing, and culture

Synonyms:
• Kala azar
• Cutaneous leishmaniasis
• Uta
• Visceral leishmaniasis

COLLECTION

Sample Type:
Cutaneous/mucocutanous leishmaniasis: Tissue/biopsy, lesion aspirate
Visceral leishmaniasis: bone marrow

Collect:
Biopsy/tissue: Sterile container
Lesion aspirate: Sterile container or syringe capped with Luer plug
Bone marrow: Lavender top (EDTA)

Amount to Collect:
Tissue/biopsy: 4 mm punch biopsies x 1-2
Lesion aspirate or bone marrow: 0.5 mL

Preferred Volume:
Tissue/biopsy: 4 mm punch biopsies x 1-2
Lesion aspirate or bone marrow: 0.5 mL

Minimum Volume:
Tissue/biopsy: 4 mm punch biopsies x 1-2
Lesion aspirate or bone marrow: 0.5 mL

Remarks:
Contact parasitologist in Microbiology Lab x31268 prior to obtaining specimens, and to discuss appropriate types of samples and collection instructions.

Deliver the specimen to the laboratory within 30 minutes of collection.

Include travel/residence history on requisition.

Stability (from collection to initiation):
Room temperature 24 hours

Unacceptable Conditions:
Fixed specimens

PROCESSING

Test Code:
P403L
Test Group:
Leishmania
Sendout:
Appropriate samples can be sent to CDC for PCR and culture after consultation with Microbiology.
Performing Lab:
Microbiology
Preferred Volume:
- Tissue/biopsy: 4 mm punch biopsies x 1-2
- Lesion aspirate or bone marrow: 0.5 mL
Minimum Volume:
- Tissue/biopsy: 4 mm punch biopsies x 1-2
- Lesion aspirate or bone marrow: 0.5 mL
Unacceptable Conditions:
Fixed specimens
Stability (from collection to initiation):
Room temperature 24 hours

RESULT INTERPRETATION

Reference Interval:
No Leishmania seen or detected
Additional Information:
Lesion biopsies and aspirates can be examined by stain and/or culture in patients with cutaneous or mucocutaneous leishmaniasis. Biopsy of liver, spleen, or lymph node, or bone marrow can be examined by stain and/or culture in visceral leishmaniasis (Kala azar). A portion of any tissue sample should also be submitted to Pathology.

Physician may also request Microbiology to send sample to CDC for PCR and DNA sequencing, and culture

ADMINISTRATIVE

CPT Codes:
87207

COMPLETE VIEW

Approval Required:
No, but contact parasitologist in Microbiology (x31268) prior to collecting samples
Available Stat:
No
Test Code:
P403L
Test Group:
Leishmania
Performing Lab:
Microbiology
Sendout:
Appropriate samples can be sent to CDC for PCR and culture after consultation with Microbiology.
Performed:
Monday-Thursday before 12:30 pm

Methodology:
Microscopy (Giema stain of smears)

Remarks:
Contact parasitologist in Microbiology Lab x31268 prior to obtaining specimens, and to discuss appropriate types of samples and collection instructions.

Deliver the specimen to the laboratory within 30 minutes of collection.

Include travel/residence history on requisition.

Collect:
- Biopsy/tissue: Sterile container
- Lesion aspirate: Sterile container or syringe capped with Luer plug
- Bone marrow: Lavender top (EDTA)

Amount to Collect:
- Tissue/biopsy: 4 mm punch biopsies x 1-2
- Lesion aspirate or bone marrow: 0.5 mL

Sample Type:
- Cutaneous/mucocutaneous leishmaniasis: Tissue/biopsy, lesion aspirate
- Visceral leishmaniasis: bone marrow

Preferred Volume:
- Tissue/biopsy: 4 mm punch biopsies x 1-2
- Lesion aspirate or bone marrow: 0.5 mL

Minimum Volume:
- Tissue/biopsy: 4 mm punch biopsies x 1-2
- Lesion aspirate or bone marrow: 0.5 mL

Unacceptable Conditions:
- Fixed specimens

Reference Interval:
- No Leishmania seen or detected

Synonyms:
- Kala azar
- Cutaneous leishmaniasis
- Uta
- Visceral leishmaniasis

Stability (from collection to initiation):
Room temperature 24 hours

Reported:
- Giemsa smears 1-3 days PCR/Sequencing 6 weeks

Additional Information:
Lesion biopsies and aspirates can be examined by stain and/or culture in patients with cutaneous or mucocutaneous leishmaniasis. Biopsy of liver, spleen, or lymph node, or bone marrow can be examined by stain and/or culture in visceral leishmaniasis (Kala azar). A portion of any tissue sample should also be submitted to Pathology.

Physician may also request Microbiology to send sample to CDC for PCR and DNA sequencing, and culture

CPT Codes:
87207
# Leishmania species Antibodies

**LEISB**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Immunoassay

**Reported:**
- Set up 5x per week. Turnaround 3-7 days

**Additional Information:**
- There is significant cross reactivity between the various Leishmania species with this assay. It is not specific for any single species.

See also Parasites-Culture and-Skin.

**Synonyms:**
- Kala azar
- Cutaneous leishmaniasis
- Uta
- Visceral leishmaniasis
- Leishmania mexicana
- Leishmania donovani
- Leishmania tropica
- Leishmania braziliensis

## COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top (Gold top acceptable)

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Stability (from collection to initiation):**
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

## PROCESSING

**Test Code:**
- LEISB

**Test Group:**
- Leishmania

**Sendout:**
- Yes

**Performing Lab:**
- Quest

---

Test information subject to change
Specimen Preparation:
Refrigerate sample at 4C. Order Quest # 42200N

For B&T patients order BTMOLT.

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
Titer

Reference Interval:
Negative

Additional Information:
There is significant cross reactivity between the various Leishmania species with this assay. It is not specific for any single species.

See also Parasites-Culture and-Skin.

ADMINISTRATIVE

CPT Codes:
86717-90 x8

LOINC Codes:
23156-3

COMPLETE VIEW

Available Stat:
No

Test Code:
LEISB

Test Group:
Leishmania

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immuoassay

Collect:
Red top (Gold top acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Refrigerate sample at 4C. Order Quest # 42200N
For B&T patients order BTMOLT.

**Units:**
Titer

**Reference Interval:**
Negative

**Synonyms:**
- Kala azar
- Cutaneous leishmaniasis
- Uta
- Visceral leishmaniasis
- Leishmania mexicana
- Leishmania donovani
- Leishmania tropica
- Leishmania braziliensis

**Stability (from collection to initiation):**
Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

**Reported:**
Set up 5x per week. Turnaround 3-7 days

**Additional Information:**
There is significant cross reactivity between the various Leishmania species with this assay. It is not specific for any single species.

See also Parasites-Culture and-Skin.

**CPT Codes:**
86717-90 x8

**LOINC Codes:**
23156-3
Leptin
LEPN

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Electrochemiluminescence (ECL)
Reported: Set up 2x per week. Turnaround 3-10 days

COLLECTION

Sample Type: Serum
Collect: Red top, Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 weeks, frozen at -20°C 5 weeks.
Unacceptable Conditions: Markedly icteric or hemolyzed samples
Rejection Criteria: Markedly icteric or hemolyzed samples

PROCESSING

Test Code: LEPN
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate sample. Order Quest # 90367
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Unacceptable Conditions: Markedly icteric or hemolyzed samples
Rejection Criteria: Markedly icteric or hemolyzed samples
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 weeks, frozen at -20°C 5 weeks.

Test information subject to change
RESULT INTERPRETATION

Reference Interval:
Adult Lean Subjects (18-61 years) with BMI range of 18-25:
Males 1.2 - 9.5 ng/mL
Females 4.1 - 25.0 ng/mL

Adult Subjects (19-60 years) with BMI range 25-30:
Males 1.6 - 20.9 ng/mL
Females 13.1 - 40.8 ng/mL

Pediatric:
Male Female
Prepubertal 1.6-10.8 ng/mL 1.7-10.6 ng/mL
Tanner Stages II-III 2.1-11.6 ng/mL 2.6-11.5 ng/mL
Tanner Stages IV-V 3.4-10.2 ng/mL 3.4-13.0 ng/mL

ADMINISTRATIVE

CPT Codes:
82397-90
LOINC Codes:
21365-2

COMPLETE VIEW

Available Stat:
No
Test Code:
LEPN
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Electrochemiluminescence (ECL)
Collect:
Red top, Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Rejection Criteria:
Markedly icteric or hemolyzed samples
Unacceptable Conditions:
Markedly icteric or hemolyzed samples
Specimen Preparation:
Refrigerate sample. Order Quest # 90367
Reference Interval:
Adult Lean Subjects (18-61 years) with BMI range of 18-25:
Males 1.2 - 9.5 ng/mL
Females 4.1 - 25.0 ng/mL
Adult Subjects (19-60 years) with BMI range 25-30:
Males 1.6 - 20.9 ng/mL
Females 13.1 - 40.8 ng/mL

Pediatric: Male Female
Prepubertal 1.6-10.8 ng/mL 1.7-10.6 ng/mL
Tanner Stages II-III 2.1-11.6 ng/mL 2.6-11.5 ng/mL
Tanner Stages IV-V 3.4-10.2 ng/mL 3.4-13.0 ng/mL

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 weeks, frozen at -20C 5 weeks.

Reported:
Set up 2x per week. Turnaround 3-10 days

CPT Codes:
82397-90

LOINC Codes:
21365-2
Leukemia Cytogenetics
BCYTLL, CYTLL

ORDERING

Approval Required:
Yes, contact Cytogenetics at x3-4813 if requested on blood samples.

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Methodology:
Giemsa banding and brightfield microscopy

Reported:
7-10 days

Synonyms:
- Cytogenetic analysis
- Chromosomal analysis
- Karyotype
- Karyotyping

COLLECTION

Sample Type:
Heparinized bone marrow, whole blood or marrow core

Collect:
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
Bone marrow: 3 mL
Blood: 3 mL
Bone core: 2 cm

Preferred Volume:
Bone marrow: 3 mL
Blood: 3 mL
Bone core: 2 cm

Minimum Volume:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 1 cm

Remarks:
Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.

Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.

If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube of peripheral blood. Contact Hematology if the specimen is more than 24 hours old.

Keep sample at room temperature.

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**PROCESSING**

**Test Code:**
- BCYTLL: Blood
- CYTLL: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Specimen Preparation:**
Keep sample at room temperature. Do not centrifuge.

**Preferred Volume:**
- Bone marrow: 3 mL
- Blood: 3 mL
- Bone core: 2 cm

**Minimum Volume:**
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 1 cm

**Unacceptable Conditions:**
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Stability (from collection to initiation):**
48 hours

**ADMINISTRATIVE**

**CPT Codes:**
- 88237x1, 88264x1, 88280x1

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
- 33893-9

**COMPLETE VIEW**

**Approval Required:**
Yes, contact Cytogenetics at x3-4813 if requested on blood samples.

**Available Stat:**
No

**Test Code:**
- BCYTLL: Blood
- CYTLL: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Methodology:**
Giemsa banding and brightfield microscopy

**Remarks:**
Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.

Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.

If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube of peripheral blood. Contact Hematology if the specimen is more than 24 hours old.

Keep sample at room temperature.

**Collect:**
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

**Amount to Collect:**
- Bone marrow: 3 mL
- Blood: 3 mL
- Bone core: 2 cm

**Sample Type:**
- Heparinized bone marrow, whole blood or marrow core

**Preferred Volume:**
- Bone marrow: 3 mL
- Blood: 3 mL
- Bone core: 2 cm

**Minimum Volume:**
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 1 cm

**Unacceptable Conditions:**
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Specimen Preparation:**
- Keep sample at room temperature. Do not centrifuge.

**Synonyms:**
- Cytogenetic analysis
- Chromosomal analysis
- Karyotype
- Karyotyping

**Stability (from collection to initiation):**
- 48 hours

**Reported:**
- 7-10 days

**CPT Codes:**
- 88237x1, 88264x1, 88280x1

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 33893-9
Leukemia Minimal Residual Disease Testing (Flow cytometry)
MRDFC

ORDERING

Available Stat: No
Performing Lab: Univ. of Washington
Methodology: Flow cytometry
Reported: 2-3 days
Additional Information: Samples must be accompanied by a completed Univ. of Washington Hematopathology lab requisition.
Synonyms: • MRD
• flow cytometry

COLLECTION

Sample Type: Bone marrow aspirate, peripheral blood
Collect: Dark Green top, EDTA (purple top) is acceptable but less desirable
Amount to Collect: 2 mL
Preferred Volume: 2 mL
Minimum Volume: 1 mL
Remarks: Due to limited sample stability, collect samples Monday-Thursday only and avoiding holidays.
Samples must be accompanied by a completed Univ. of Washington Hematopathology lab requisition.
Stability (from collection to initiation): <3 days

PROCESSING

Test Code: MRDFC
Sendout: Yes
Performing Lab: Univ. of Washington
Specimen Preparation: Maintain sample at room temperature. Ship via FedEx Monday - Saturday to: Hematopathology Laboratory, SCCA Room G7800, 825 Eastlake Ave. E., Seattle, WA 98109, Ph: (206)288-7060, Fax: (206)288-7127
Preferred Volume: 2 mL
Minimum Volume: 1 mL
Stability (from collection to initiation):
<3 days

RESULT INTERPRETATION

Additional Information:
Samples must be accompanied by a completed Univ. of Washington Hematopathology lab requisition.

COMPLETE VIEW

Available Stat:
No

Test Code:
MRDFC

Performing Lab:
Univ. of Washington

Sendout:
Yes

Methodology:
Flow cytometry

Remarks:
Due to limited sample stability, collect samples Monday-Thursday only and avoiding holidays.

Samples must be accompanied by a completed Univ. of Washington Hematopathology lab requisition.

Collect:
Dark Green top, EDTA (purple top) is acceptable but less desirable

Amount to Collect:
2 mL

Sample Type:
Bone marrow aspirate, peripheral blood

Preferred Volume:
2 mL

Minimum Volume:
1 mL

Specimen Preparation:
Maintain sample at room temperature. Ship via FedEx Monday - Saturday to: Hematopathology Laboratory, SCCA Room G7800, 825 Eastlake Ave. E., Seattle, WA 98109, Ph: (206)288-7060, Fax: (206)288-7127

Synonyms:
- MRD
- flow cytometry

Stability (from collection to initiation):
<3 days

Reported:
2-3 days

Additional Information:
Samples must be accompanied by a completed Univ. of Washington Hematopathology lab requisition.
Leukemia/Lymphoma Markers
LEUM, LEUMBF

ORDERING

Available Stat:
No

Performing Lab:
Immunology

Performed:
Monday-Saturday (day shift)

Methodology:
Flow cytometry

Reported:
Preliminary result available from laboratory in 1-2 days. Written interpretive report sent within 7 days.

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This testing is appropriate for the evaluation of suspected hematologic malignancies, including Sezary's syndrome. Groups of monoclonal antibodies selected as appropriate for the diagnoses under consideration, are employed to detect one or more of the following phenotypic subsets:

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Cells Detected/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD2</td>
<td>T cells (E rosette sheep RBC receptor)</td>
</tr>
<tr>
<td>CD3</td>
<td>T cells</td>
</tr>
<tr>
<td>CD4</td>
<td>helper and inducer T cells and monocytes</td>
</tr>
<tr>
<td>CD5</td>
<td>T cells, NK cells and B cell subsets, most CLL</td>
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<tr>
<td>CD7</td>
<td>T cells, lost on most sezary cells</td>
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<tr>
<td>CD8</td>
<td>suppressor and cytotoxic T cells and NK cells</td>
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<td>CD10</td>
<td>immature lymphoid and germinal center cells, many pre-B ALL</td>
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<tr>
<td>CD11c</td>
<td>monocytes, NK cells and B cell subsets</td>
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<tr>
<td>CD13</td>
<td>myeloid lineage cells</td>
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<tr>
<td>CD14</td>
<td>monocytes</td>
</tr>
<tr>
<td>CD15</td>
<td>myeloid and Reed-Sternberg cells and rare T cells</td>
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<tr>
<td>CD16</td>
<td>NK cells and T cell subsets</td>
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<td>CD19</td>
<td>mature B and pre-B cells</td>
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<td>CD20</td>
<td>mature B cells, some T cells</td>
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<td>B cells, most CLL</td>
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<td>CD45</td>
<td>all leukocytes</td>
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<td>CD52</td>
<td>CAMPATH-1, lymphoid malignancies</td>
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<tr>
<td>CD56</td>
<td>NK cells and T cell subsets</td>
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<td>CD61</td>
<td>megakaryocytes and platelets</td>
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<tr>
<td>CD117</td>
<td>c-kit, myeloid lineage</td>
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<tr>
<td>Kappa</td>
<td>kappa light chain-positive B cells</td>
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<tr>
<td>Lambda</td>
<td>lambda light chain-positive B cells</td>
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</table>

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:
- AML
- acute myeloid leukemia
- ALL
- Acute lymphocytic leukemia
- Acute lymphoblastic leukemia
- T-ALL
- B-ALL
- CLL
- Chronic lymphocytic leukemia
- Mantel cell lymphoma
- Immunoblastic lymphoma
- small cell lymphoma
- follicular lymphoma
- large cell lymphoma
- Burkitt's lymphoma
- diffuse lymphoma, small cleaved cell lymphoma
- lymphoblastic lymphoma
- flow cytometry
- Sezary Cells
- Sezary Syndrome
- Mycosis fungoides

**COLLECTION**

**Sample Type:**
- EDTA whole blood, Bone marrow, Unfixed tissue, Tissue aspirates, CSF, Body fluids (with approval)

**Collect:**
- Blood or marrow: Lavender top
- CSF: CSF tube or sterile collection tube
- Body Fluid: 50 mL conical bottom plastic tube with blue screw cap preferred

**Amount to Collect:**
- 3 mL blood

**Preferred Volume:**
- Amount of specimen needed varies call Immunology, x3-1712, for consultation

**Remarks:**
- Bone marrow aspirates should be held at room temperature. Fine needle aspirates should be refrigerated until they can be assayed (this medium is available in refrigerator at Specimen Receiving in the main laboratory).

- Test performed Monday-Friday at 1200, results available at 1700 hours the following day. Saturday at 1200, results available at 1700 hours on Monday.

- If results are required for immediate patient treatment, for which the above schedule will not suffice, contact the Laboratory Medicine resident.

**Unacceptable Conditions:**
- Reject samples that have been frozen, stored in fixative, transported or stored at improper temperatures.

**PROCESSING**

**Test Code:**
- LEUM: Blood
- LEUMBF: Bone marrow and other body fluids
Test Group:
CD

Performing Lab:
Immunology

Specimen Preparation:
Hold bone marrow specimens at room temperature, but refrigerate fine needle aspirates in special holding medium. Do NOT centrifuge. Each specimen should be assigned its own accession number.

If specimens are delivered after 1200 hours on Saturday, anytime Sunday or on a holiday contact the resident on call.

Preferred Volume:
Amount of specimen needed varies call Immunology, x3-1712, for consultation

For body fluids 80-100 mL is generally sufficient but this is dependent on the cell count.

Unacceptable Conditions:
Reject samples that have been frozen, stored in fixative, transported or stored at improper temperatures.

RESULT INTERPRETATION

Reference Interval:
See Additional Information

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This testing is appropriate for the evaluation of suspected hematologic malignancies, including Sezary's syndrome. Groups of monoclonal antibodies selected as appropriate for the diagnoses under consideration, are employed to detect one or more of the following phenotypic subsets:

<table>
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<tr>
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<tr>
<td>CD2</td>
<td>T cells (E rosette sheep RBC receptor)</td>
</tr>
<tr>
<td>CD3</td>
<td>T cells</td>
</tr>
<tr>
<td>CD4</td>
<td>helper and inducer T cells and monocytes</td>
</tr>
<tr>
<td>CD5</td>
<td>T cells, NK cells and B cell subsets, most CLL</td>
</tr>
<tr>
<td>CD7</td>
<td>T cells, lost on most sezary cells</td>
</tr>
<tr>
<td>CD8</td>
<td>suppressor and cytotoxic T cells and NK cells</td>
</tr>
<tr>
<td>CD10</td>
<td>immature lymphoid and germinal center cells, many pre-B ALL</td>
</tr>
<tr>
<td>CD11c</td>
<td>monocytes, NK cells and B cell subsets</td>
</tr>
<tr>
<td>CD13</td>
<td>myeloid lineage cells</td>
</tr>
<tr>
<td>CD14</td>
<td>monocytes</td>
</tr>
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<td>CD15</td>
<td>myeloid and Reed-Sternberg cells and rare T cells</td>
</tr>
<tr>
<td>CD16</td>
<td>NK cells and T cell subsets</td>
</tr>
<tr>
<td>CD19</td>
<td>mature B and pre-B cells</td>
</tr>
<tr>
<td>CD20</td>
<td>mature B cells, some T cells</td>
</tr>
<tr>
<td>CD21</td>
<td>mature B cells</td>
</tr>
<tr>
<td>CD22</td>
<td>mature B cells</td>
</tr>
<tr>
<td>CD23</td>
<td>B cells, most CLL</td>
</tr>
<tr>
<td>CD25</td>
<td>activated T and B cells</td>
</tr>
<tr>
<td>CD33</td>
<td>myeloid lineage cells</td>
</tr>
<tr>
<td>CD34</td>
<td>hematopoietic progenitor (stem) cells</td>
</tr>
<tr>
<td>CD38</td>
<td>pre-B, pre-T, activated T and plasma cells</td>
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<td>CD45</td>
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<tr>
<td>CD52</td>
<td>CAMPATH-1, lymphoid malignancies</td>
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<td>NK cells and T cell subsets</td>
</tr>
<tr>
<td>CD61</td>
<td>megakaryocytes and platelets</td>
</tr>
<tr>
<td>CD117</td>
<td>c-kit, myeloid lineage</td>
</tr>
<tr>
<td>Kappa</td>
<td>kappa light chain-positive B cells</td>
</tr>
<tr>
<td>Lambda</td>
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</tbody>
</table>

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
ADMINISTRATIVE

CPT Codes:
88184; 88185 x 21
LDT or Modified FDA:
Yes
LOINC Codes:
54226-6

COMPLETE VIEW

Available Stat:
No
Test Code:
LEUM: Blood
LEUMBF: Bone marrow and other body fluids
Test Group:
CD
Performing Lab:
Immunology
Performed:
Monday-Saturday (day shift)
Methodology:
Flow cytometry
Remarks:
Bone marrow aspirates should be held at room temperature. Fine needle aspirates should be refrigerated until they can be assayed (this medium is available in refrigerator at Specimen Receiving in the main laboratory).

Test performed Monday-Friday at 1200, results available at 1700 hours the following day. Saturday at 1200, results available at 1700 hours on Monday.

If results are required for immediate patient treatment, for which the above schedule will not suffice, contact the Laboratory Medicine resident.

Collect:
Blood or marrow: Lavender top
CSF: CSF tube or sterile collection tube
Body Fluid: 50 mL conical bottom plastic tube with blue screw cap preferred
Amount to Collect:
3 mL blood
Sample Type:
EDTA whole blood, Bone marrow, Unfixed tissue, Tissue aspirates, CSF, Body fluids (with approval)
Preferred Volume:
Amount of specimen needed varies call Immunology, x3-1712, for consultation

For body fluids 80-100 mL is generally sufficient but this is dependent on the cell count.
Unacceptable Conditions:
Reject samples that have been frozen, stored in fixative, transported or stored at improper temperatures.
Specimen Preparation:
Hold bone marrow specimens at room temperature, but refrigerate fine needle aspirates in special holding medium. Do NOT centrifuge. Each specimen should be assigned its own accession number.

If specimens are delivered after 1200 hours on Saturday, anytime Sunday or on a holiday contact the resident on call.
Reference Interval:
See Additional Information
Synonyms:
• AML
- acute myeloid leukemia
- ALL
- Acute lymphocytic leukemia
- Acute lymphoblastic leukemia
- T-ALL
- B-ALL
- CLL
- Chronic lymphocytic leukemia
- Mantel cell lymphoma
- Immunoblastic lymphoma
- small cell lymphoma
- follicular lymphoma
- large cell lymphoma
- Burkitt's lymphoma
- diffuse lymphoma, small cleaved cell lymphoma
- lymphoblastic lymphoma
- flow cytometry
- Sezary Cells
- Sezary Syndrome
- Mycosis fungoides

**Reported:**
Prepared result available from laboratory in 1-2 days. Written interpretive report sent within 7 days.

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This testing is appropriate for the evaluation of suspected hematologic malignancies, including Sezary's syndrome. Groups of monoclonal antibodies selected as appropriate for the diagnoses under consideration, are employed to detect one or more of the following phenotypic subsets:

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CD117  c-kit, myeloid lineage
Kappa  kappa light chain-positive B cells
Lambda  lambda light chain-positive B cells

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. Only some of the reagents used have been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
  88184; 88185 x 21

LDT or Modified FDA:
  Yes

LOINC Codes:
  54226-6

Test information subject to change
Levetiracetam

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: HPLC/MS/MS
Reported: test performed Monday-Saturday. Turnaround time 3-5 days
Synonyms: • Keppra

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 2 months.

PROCESSING

Test Code: LEV
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Freeze serum at -20°C. Ship frozen, Order Quest # 15142X
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 2 months.

RESULT INTERPRETATION

Units: µg/mL (mcg/mL)
Reference Interval: PRINTED 06/07/19
Test information subject to change
### Dosage

<table>
<thead>
<tr>
<th>Dosage</th>
<th>Trough</th>
<th>Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500 mg BID</td>
<td>3.1-10.0 µg/mL</td>
<td>10.0-25.0 µg/mL</td>
</tr>
<tr>
<td>1000 mg BID</td>
<td>4.9-37.1 µg/mL</td>
<td>30.0-40.0 µg/mL</td>
</tr>
<tr>
<td>1500 mg BID</td>
<td>7.0-34.0 µg/mL</td>
<td>36.1-70.0 µg/mL</td>
</tr>
</tbody>
</table>

Note: Toxic levels not established

### Critical Values:

- Quest Priority-2: peak > 70 µg/mL or trough > 37 µg/mL

### Administrative

<table>
<thead>
<tr>
<th>CPT Codes:</th>
<th>LOINC Codes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>80177-90</td>
<td>30471-7</td>
</tr>
</tbody>
</table>

### Complete View

- Available Stat: No
- Test Code: LEV
- Performing Lab: Quest
- Sendout: Yes
- Methodology: HPLC/MS/MS
- Collect: Red top
- Amount to Collect: 2 mL blood
- Sample Type: Serum
- Preferred Volume: 1 mL serum
- Minimum Volume: 0.5 mL serum
- Specimen Preparation: Freeze serum at -20°C. Ship frozen, Order Quest # 15142X
- Units: µg/mL (mcg/mL)
- Reference Interval:

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</table>

Note: Toxic levels not established

### Critical Values:

- Quest Priority-2: peak > 70 µg/mL or trough > 37 µg/mL

### Synonyms:

- Keppra

### Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen at -20C 2 months.

**Reported:**
- test performed Monday-Saturday. Turnaround time 3-5 days

**CPT Codes:**
- 80177-90

**LOINC Codes:**
- 30471-7

Test information subject to change
Lidocaine
LIDO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Set up 5x per week. Turnaround 2-4 days
Synonyms:
• xylocaine

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Remarks:
Collect as a trough sample.
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20C 1 month.
Unacceptable Conditions:
Collected in Gold top.

PROCESSING

Test Code:
LIDO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Process immediately, forward specimen to Sendout at China Basin by 3 pm PDQ pickup (Monday-Friday). Order Quest test # 605
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Unacceptable Conditions:
Collected in Gold top.
Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20C 1 month.
RESULT INTERPRETATION

Units:
  mg/L

Reference Interval:
  Therapeutic: 1.5-5.0 mg/L

Critical Values:
  UCSF: > 7.0 mg/L
  Quest: >= 6.0 mg/L

ADMINISTRATIVE

CPT Codes:
  80176-90

LOINC Codes:
  3714-3

COMPLETE VIEW

Available Stat:
  No

Test Code:
  LIDO

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Immunoassay

Remarks:
  Collect as a trough sample.

Collect:
  Red top (Gold top NOT acceptable)

Amount to Collect:
  2 mL blood

Sample Type:
  Serum

Preferred Volume:
  1 mL serum

Minimum Volume:
  0.2 mL serum

Unacceptable Conditions:
  Collected in Gold top.

Specimen Preparation:
  Process immediately, forward specimen to Sendout at China Basin by 3 pm PDQ pickup (Monday-Friday). Order Quest test # 605

Units:
  mg/L

Reference Interval:
  Therapeutic: 1.5-5.0 mg/L

Critical Values:
  UCSF: > 7.0 mg/L
  Quest: >= 6.0 mg/L

Synonyms:
  • xylocaine

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 1 week, frozen at -20C 1 month.

Reported:
Set up 5x per week. Turnaround 2-4 days

CPT Codes:
  80176-90

LOINC Codes:
  3714-3
Lipase, Plasma / Serum
LIPA

ORDERING

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (see Additional Information)

Reported:
4 hours

Additional Information:
Method: Kinetic assay with spectrophotometric detection of methylresorufin from the substrate 1,2-0-dilauryl-rac-glycero-3-glutaric acid (6'-methylresorufin)-ester. Colipase is used to stabilize the lipase and deoxycholate to reduce the activity of non-pancreatic lipases.

Lipase can at times be elevated in pancreatitis when amylase is normal, but may also be falsely elevated in a variety of non-pancreatic disorders (e.g., GI disease, renal insufficiency). This test is not ordinarily offered stat except for potential pancreas transplant donor samples.

COLLECTION

Sample Type:
Plasma or serum

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

PROCESSING

Test Code:
LIPA

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
U/L

**Reference Interval:**

19-56 U/L

Normal range was determined by testing 271 male and female healthy adult blood donors at UCSF.

**Additional Information:**

Method: Kinetic assay with spectrophotometric detection of methylresorufin from the substrate 1,2-O-dilauryl-rac-glycero-3-glutaric acid (6′-methylresorufin)-ester. Colipase is used to stabilize the lipase and deoxycholate to reduce the activity of non-pancreatic lipases.

Lipase can at times be elevated in pancreatitis when amylase is normal, but may also be falsely elevated in a variety of non-pancreatic disorders (e.g., GI disease, renal insufficiency). This test is not ordinarily offered stat except for potential pancreas transplant donor samples.

**ADMINISTRATIVE**

**CPT Codes:**

- 83690

**LOINC Codes:**

- 3040-3

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- LIPA

**Performing Lab:**

- Parnassus & Mission Bay Chemistry

**Performed:**

- Test available 24 hours per day 7 days per week

**Methodology:**

- Spectrophotometric (see Additional Information)

**Collect:**

- Light green top preferred, Gold top acceptable

**Amount to Collect:**

- 1 mL blood

**Sample Type:**

- Plasma or serum

**Preferred Volume:**

- 0.5 mL plasma or serum

**Minimum Volume:**

- 0.2 mL plasma or serum

**Units:**

- U/L

**Reference Interval:**

- 19-56 U/L

Normal range was determined by testing 271 male and female healthy adult blood donors at UCSF.

**Stability (from collection to initiation):**

- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

**Reported:**

- 4 hours

**Additional Information:**

Method: Kinetic assay with spectrophotometric detection of methylresorufin from the substrate 1,2-O-dilauryl-rac-glycero-3-glutaric acid (6′-methylresorufin)-ester. Colipase is used to stabilize the lipase and deoxycholate to reduce the activity of non-pancreatic lipases.

Lipase can at times be elevated in pancreatitis when amylase is normal, but may also be falsely elevated in a variety of non-pancreatic disorders (e.g., GI disease, renal insufficiency). This test is not ordinarily offered stat except for potential pancreas transplant donor samples.
disorders (e.g., GI disease, renal insufficiency). This test is not ordinarily offered stat except for potential pancreas transplant donor samples.

**CPT Codes:**

83690

**LOINC Codes:**

3040-3
Lipoprotein (a)  
LPA

ORDERING

Available Stat:  
No

Performing Lab:  
Immunology

Performed:  
Monday, Wednesday, Friday (day shift)

Methodology:  
Nephelometry particle-enhanced

Reported:  
2-5 days

Additional Information:  
Lipoprotein(a) is a modified form of LDL in which a large glycoprotein, apo(a) is covalently bound to apo(B) by a disulfide bridge. Studies that evaluated Lp(a) as a predictor of cardiovascular events have had conflicting results. Some studies suggested that Lp(a) was an independent risk factor for CHD, while others showed no significant association. There may be a role for elevated Lp(a) levels in predicting CHD events in subjects with concomitant hypercholesterolemia. While a cutoff of 75 nmol/L is frequently used as indication of elevated Lp(a) there appears to be racial differences in the reference range for Lp(a) when studying different racial groups without evidence of coronary heart disease. Additionally the size of the Lp(a) particle can affect the quantitation of this molecule making inter-method comparisons difficult. If fasting is not observed for 12 hours, elevated levels of Lp(a) will be detected.

References


Synonyms:

- Lp(a)

COLLECTION

Patient Preparation:  
An 8 hour fast before specimen collection is preferred.

Sample Type:  
Serum

Collect:  
Gold top

Amount to Collect:  
2 mL blood

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.3 mL serum

Stability (from collection to initiation):  
Room temperature 6 hours, refrigerated 2 weeks, frozen at -20C 3 months.

Unacceptable Conditions:  
Lipemic samples

PROCESSING
Test Code:
LPA
Performing Lab:
Immunology
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic samples
Stability (from collection to initiation):
Room temperature 6 hours, refrigerated 2 weeks, frozen at -20C 3 months.

RESULT INTERPRETATION

Units:
nmol/L
Reference Interval:
<75 nmol/L
Additional Information:
Lipoprotein(a) is a modified form of LDL in which a large glycoprotein, apo(a) is covalently bound to apo(B) by a disulfide bridge. Studies that evaluated Lp(a) as a predictor of cardiovascular events have had conflicting results.

Some studies suggested that Lp(a) was an independent risk factor for CHD, while others showed no significant association. There may be a role for elevated Lp(a) levels in predicting CHD events in subjects with concomitant hypercholesterolemia. While a cutoff of 75 nmol/L is frequently used as indication of elevated Lp(a) there appears to be racial differences in the reference range for Lp(a) when studying different racial groups without evidence of coronary heart disease. Additionally the size of the Lp(a) particle can affect the quantitation of this molecule making inter-method comparisons difficult. If fasting is not observed for 12 hours, elevated levels of Lp(a) will be detected.

References

ADMINISTRATIVE

CPT Codes:
83695
LOINC Codes:
49748-7

COMPLETE VIEW

Available Stat:
No
Test Code:
LPA
Performing Lab:
Immunology
Performed:
Monday, Wednesday, Friday (day shift)
Methodology:
Nephelometry particle-enhanced

**Patient Preparation:**

An 8 hour fast before specimen collection is preferred.

**Collect:**

Gold top

**Amount to Collect:**

2 mL blood

**Sample Type:**

Serum

**Preferred Volume:**

1 mL serum

**Minimum Volume:**

0.3 mL serum

**Unacceptable Conditions:**

Lipemic samples

**Units:**

nmol/L

**Reference Interval:**

<75 nmol/L

**Synonyms:**

- Lp(a)

**Stability (from collection to initiation):**

Room temperature 6 hours, refrigerated 2 weeks, frozen at -20°C 3 months.

**Reported:**

2-5 days

**Additional Information:**

Lipoprotein(a) is a modified form of LDL in which a large glycoprotein, apo(a) is covalently bound to apo(B) by a disulfide bridge. Studies that evaluated Lp(a) as a predictor of cardiovascular events have had conflicting results.

Some studies suggested that Lp(a) was an independent risk factor for CHD, while others showed no significant association. There may be a role for elevated Lp(a) levels in predicting CHD events in subjects with concomitant hypercholesterolemia. While a cutoff of 75 nmol/L is frequently used as indication of elevated Lp(a) there appears to be racial differences in the reference range for Lp(a) when studying different racial groups without evidence of coronary heart disease. Additionally the size of the Lp(a) particle can affect the quantitation of this molecule making inter-method comparisons difficult. If fasting is not observed for 12 hours, elevated levels of Lp(a) will be detected.

**References**


**CPT Codes:**

83695

**LOINC Codes:**

49748-7
Lipoprotein Metabolism Profile
LMPP

ORDERING

Performing Lab:
Mayo
Performed:
No
Methodology:
Ultracentrifugation/Electrophoresis/Automated Enzymatic/Colorimetric Analysis
Reported:
4 - 7 days

Additional Information:
Lipoprotein metabolism profile analysis adds practical information about the etiology of cholesterol and/or triglyceride elevation. In some patients, increased serum lipids reflects elevated levels of intermediate-density lipoprotein (IDL), very-low-density lipoprotein (VLDL), lipoprotein a (Lp[a]), or even the abnormal lipoprotein complex-LpX. These elevations can be indicative of a genetic deficiency in lipid metabolism or transport, nephrotic syndrome, endocrine dysfunction or even cholestasis. Identification of the lipoprotein associated with lipid elevation is achieved using the gold-standard methods, which include ultracentrifugation, selective precipitation, electrophoresis, and direct measurement of cholesterol and triglycerides in isolated lipoprotein fractions. Proper characterization of a patient's dyslipidemic phenotype aids clinical decisions and guides appropriate therapy.

Classifying the hyperlipoproteinemias into phenotypes places disorders that affect plasma lipid and lipoprotein concentrations into convenient groups for evaluation and treatment. A clear distinction must be made between primary (inherited) and secondary (liver disease, alcoholism, metabolic diseases) causes of dyslipoproteinemia. Lipoprotein profiling will identify the presence of Lp(a) and LpX and distinguish between the following dyslipidemias:

- Exogenous hyperlipemia (Type I)
- Familial Hypercholesterolemia (Type IIa)
- Familial Combined Hyperlipidemia (Type IIb)
- Familial dysbetalipoproteinemia (Type III)
- Endogenous hyperlipemia (Type IV)
- Mixed hyperlipemia (Type V)

Synonyms:
- lipid panel
- Apo B
- Apolipoprotein B
- Lp(a)
- LpX
- Lipoprotein (a)
- Lipoprotein X

COLLECTION

Patient Preparation:
1. Fasting-overnight (12-14 hours)
2. Patient must not consume any alcohol for 24 hours before the specimen is drawn.

Sample Type:
Serum
Collect:
Red-top or gold-top
Amount to Collect:
- 10 mL blood

Preferred Volume:
- 5 mL serum

Minimum Volume:
- 2 mL serum

Stability (from collection to initiation):
- Refrigerated: 7 days
- Frozen: 60 days

Rejection Criteria:
- Gross Hemolysis/Icterus

PROCESSING

Test Code:
- LMPP

Sendout:
- Yes

Performing Lab:
- Mayo

Specimen Preparation:
- Aliquot and refrigerate. Send to CB refrigerated. Order Mayo test code LMPP.

Preferred Volume:
- 5 mL serum

Minimum Volume:
- 2 mL serum

Rejection Criteria:
- Gross Hemolysis/Icterus

Stability (from collection to initiation):
- Refrigerated: 7 days
- Frozen: 60 days

RESULT INTERPRETATION

Additional Information:

Lipoprotein metabolism profile analysis adds practical information about the etiology of cholesterol and/or triglyceride elevation. In some patients, increased serum lipids reflects elevated levels of intermediate-density lipoprotein (IDL), very-low-density lipoprotein (VLDL), lipoprotein a (Lp[a]), or even the abnormal lipoprotein complex-LpX. These elevations can be indicative of a genetic deficiency in lipid metabolism or transport, nephrotic syndrome, endocrine dysfunction or even cholestasis. Identification of the lipoprotein associated with lipid elevation is achieved using the gold-standard methods, which include ultracentrifugation, selective precipitation, electrophoresis, and direct measurement of cholesterol and triglycerides in isolated lipoprotein fractions. Proper characterization of a patient's dyslipidemic phenotype aids clinical decisions and guides appropriate therapy.

Classifying the hyperlipoproteinemias into phenotypes places disorders that affect plasma lipid and lipoprotein concentrations into convenient groups for evaluation and treatment. A clear distinction must be made between primary (inherited) and secondary (liver disease, alcoholism, metabolic diseases) causes of dyslipoproteinemia. Lipoprotein profiling will identify the presence of Lp(a) and LpX and distinguish between the following dyslipidemias:

- Exogenous hyperlipemia (Type I)
- Familiar Hypercholesterolemia (Type IIa)
- Familiar Combined Hyperlipidemia (Type IIb)
- Familiar dysbetalipoproteinemia (Type III)
- Endogenous hyperlipemia (Type IV)
Mixed hyperlipemia (Type V)

**CPT Codes:**
- 82465-90
- 84478-90
- 82172-90
- 83718-90
- 83700-90

**LOINC Codes:**

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCS</td>
<td>Cholesterol, Total, CDC, S</td>
<td>2093-3</td>
</tr>
<tr>
<td>HDLS</td>
<td>HDL Cholesterol, CDC, S</td>
<td>2085-9</td>
</tr>
<tr>
<td>TRIGC</td>
<td>Triglycerides, CDC, S</td>
<td>2571-8</td>
</tr>
<tr>
<td>APLBS</td>
<td>Apolipoprotein B, S</td>
<td>1884-6</td>
</tr>
<tr>
<td>2839</td>
<td>LDL Cholesterol</td>
<td>2089-1</td>
</tr>
<tr>
<td>2840</td>
<td>LDL Triglycerides</td>
<td>3046-0</td>
</tr>
<tr>
<td>2844</td>
<td>VLDL cholesterol</td>
<td>2091-7</td>
</tr>
<tr>
<td>2847</td>
<td>VLDL triglycerides</td>
<td>3047-8</td>
</tr>
<tr>
<td>2842</td>
<td>Beta VLDL Cholesterol</td>
<td>2091-7</td>
</tr>
<tr>
<td>2843</td>
<td>Beta VLDL triglycerides</td>
<td>3045-2</td>
</tr>
<tr>
<td>2855</td>
<td>Chylomicron cholesterol</td>
<td>34467-1</td>
</tr>
<tr>
<td>2856</td>
<td>Chylomicron triglycerides</td>
<td>35363-1</td>
</tr>
<tr>
<td>2849</td>
<td>Lp(a) Cholesterol</td>
<td>10835-7</td>
</tr>
<tr>
<td>23924</td>
<td>LpX</td>
<td>42178-4</td>
</tr>
<tr>
<td>23937</td>
<td>Interpretation</td>
<td>59462-2</td>
</tr>
</tbody>
</table>

**COMPLETE VIEW**

**Test Code:**
- LMPP

**Performing Lab:**
- Mayo

**Sendout:**
- Yes

**Performed:**
- No

**Methodology:**
- Ultracentrifugation/Electrophoresis/Automated Enzymatic/Colorimetric Analysis

**Patient Preparation:**
1. Fasting-overnight (12-14 hours)
2. Patient must not consume any alcohol for 24 hours before the specimen is drawn.

**Collect:**
- Red-top or gold-top

**Amount to Collect:**
- 10 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 5 mL serum

**Minimum Volume:**
- 2 mL serum

**Rejection Criteria:**
- Gross Hemolysis/Icterus

**Specimen Preparation:**
- Aliquot and refrigerate. Send to CB refrigerated. Order Mayo test code LMPP.

**Synonyms:**
- lipid panel
- Apo B
• Apolipoprotein B
• Lp(a)
• LpX
• Lipoprotein (a)
• Lipoprotein X

Stability (from collection to initiation):
Refrigerated: 7 days
Frozen: 60 days

Reported:
4 - 7 days

Additional Information:
Lipoprotein metabolism profile analysis adds practical information about the etiology of cholesterol and/or triglyceride elevation. In some patients, increased serum lipids reflects elevated levels of intermediate-density lipoprotein (IDL), very-low-density lipoprotein (VLDL), lipoprotein a (Lp[a]), or even the abnormal lipoprotein complex-LpX. These elevations can be indicative of a genetic deficiency in lipid metabolism or transport, nephrotic syndrome, endocrine dysfunction or even cholestasis. Identification of the lipoprotein associated with lipid elevation is achieved using the gold-standard methods, which include ultracentrifugation, selective precipitation, electrophoresis, and direct measurement of cholesterol and triglycerides in isolated lipoprotein fractions. Proper characterization of a patient's dyslipidemic phenotype aids clinical decisions and guides appropriate therapy.

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Familial Hypercholesterolemia (Type IIa)
Familial Combined Hyperlipidemia (Type IIb)
Familial dysbetalipoproteinemia (Type III)
Endogenous hyperlipemia (Type IV)
Mixed hyperlipemia (Type V)

CPT Codes:
82465-90, 84478-90, 82172-90, 83718-90, 83700-90

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</tr>
<tr>
<td>23937</td>
<td>Interpretation</td>
<td>59462-2</td>
</tr>
</tbody>
</table>
LIPOPROTEIN SUBFRACTIONATION, ION MOBILITY
LSIM

ORDERING

Performing Lab: Quest
Methodology: Ion Mobility
Reported: 4-7 days
Additional Information: There is a correlation between increased risk of premature heart disease with decreasing size of LDL particles. Ion mobility offers the only direct measurement of lipoprotein particle size and concentration for each lipoprotein from HDL3 to large VLDL.

COLLECTION

Sample Type: Serum
Collect: Gold top or red top tube
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum
Stability (from collection to initiation):
   Room temperature: 24 hours
   Refrigerated: 7 days
   Frozen: 30 days
Rejection Criteria: Gross hemolysis • Gross lipemia

PROCESSING

Test Code: LSIM
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze. Transport to CB frozen. Order Quest test code 92500.
Preferred Volume: 1 mL serum
Minimum Volume: 0.25 mL serum
Rejection Criteria: Gross hemolysis • Gross lipemia
Stability (from collection to initiation):
   Room temperature: 24 hours
Refrigerated: 7 days
Frozen: 30 days

RESULT INTERPRETATION

Additional Information:
There is a correlation between increased risk of premature heart disease with decreasing size of LDL particles. Ion mobility offers the only direct measurement of lipoprotein particle size and concentration for each lipoprotein from HDL3 to large VLDL.

ADMINISTRATIVE

CPT Codes:
83704-90

COMPLETE VIEW

Test Code:
LSIM
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Ion Mobility
Patient Preparation:
Fasting preferred. Non-fasting acceptable.
Collect:
Gold top or red top tube
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.25 mL serum
Rejection Criteria:
Gross hemolysis • Gross lipemia
Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 92500.
Stability (from collection to initiation):
Room temperature: 24 hours
Refrigerated: 7 days
Frozen: 30 days
Reported:
4-7 days
Additional Information:
There is a correlation between increased risk of premature heart disease with decreasing size of LDL particles. Ion mobility offers the only direct measurement of lipoprotein particle size and concentration for each lipoprotein from HDL3 to large VLDL.
CPT Codes:
83704-90
# Listeria Antibodies

**LISTB**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Focus via Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Complement fixation</td>
</tr>
<tr>
<td>Reported:</td>
<td>Set up 5x per week. Turnaround 3-7 days</td>
</tr>
</tbody>
</table>

## COLLECTION

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect:</td>
<td>Red top or Gold top</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>2 mL blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Stability (from collection to initiation):</td>
<td>Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month.</td>
</tr>
</tbody>
</table>

## PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>LISTB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Focus via Quest</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 34329X</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>1 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Stability (from collection to initiation):</td>
<td>Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month.</td>
</tr>
</tbody>
</table>

## RESULT INTERPRETATION

<table>
<thead>
<tr>
<th>Units:</th>
<th>titer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Interval:</td>
<td>Negative: &lt; 8 titer</td>
</tr>
</tbody>
</table>
CPT Codes:
86609-90

LOINC Codes:
6456-8

Available Stat:
No

Test Code:
LISTB

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Complement fixation

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Quest test code 34329X

Units:
titer

Reference Interval:
Negative: < 8 titer

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
Set up 5x per week. Turnaround 3-7 days

CPT Codes:
86609-90

LOINC Codes:
6456-8
Lithium
Li

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: 
  Stat: Test available 24 hours per day 7 days per week.
  Routine: day shift only, seven days per week
Methodology: ISE
Reported: STAT 1 hour, Routine same or next day
Additional Information: See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

COLLECTION

Sample Type: Serum
Collect: Gold top (Green top unacceptable)
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Remarks: Time to steady state: 5 days
  Collect 30 minutes before next dose or at least 8-12 hours post dose.
  Indicate time of draw on requisition.

PROCESSING

Test Code: LI
Performing Lab: Parnassus & Mission Bay Chemistry
Specimen Preparation: Refrigerated 14 days, frozen at -20 C 2 months
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum

RESULT INTERPRETATION
Units:
mmol/L

Reference Interval:
Therapeutic: 0.5-1.5 mmol/L

Critical Values:
>2.0 mmol/L

Additional Information:
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80178

LOINC Codes:
14334-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
LI

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Stat: Test available 24 hours per day 7 days per week.

Routine: day shift only, seven days per week

Methodology:
ISE

Remarks:
Time to steady state: 5 days

Collect 30 minutes before next dose or at least 8-12 hours post dose.

Indicate time of draw on requisition.

Collect:
Gold top (Green top unacceptable)

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Refrigerated 14 days, frozen at -20 C 2 months

Units:
mmol/L

Reference Interval:
Therapeutic: 0.5-1.5 mmol/L

Critical Values:
>2.0 mmol/L

Reported:
STAT 1 hour, Routine same or next day

Additional Information:

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:

80178

LOINC Codes:

14334-7
Liver Function Panel
LFP

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day, 7 days per week
Reported: STAT 1 hour, Routine 4 hours
Additional Information: This panel includes Bilirubin, Total, Alkaline Phosphatase, ALT (alanine transaminase) and AST (aspartate transaminase).

Individual tests may be ordered separately.
Synonyms:
- LFT
- Liver function tests

COLLECTION

Sample Type: Plasma or serum
Collect: Light Green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL
Minimum Volume: 0.3 mL

PROCESSING

Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL
Minimum Volume: 0.3 mL

RESULT INTERPRETATION

Units: See individual test entries
Reference Interval: See individual test entries
Additional Information: This panel includes Bilirubin, Total, Alkaline Phosphatase, ALT (alanine transaminase) and AST (aspartate transaminase).

Individual tests may be ordered separately.
CPT Codes:
- 82247
- 84075
- 84460
- 84450

LOINC Codes:
- 34543-9
- 6768-6
- 1742-6
- 1920-8

Complete View

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day, 7 days per week

Collect:
Light Green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL

Minimum Volume:
0.3 mL

Units:
See individual test entries

Reference Interval:
See individual test entries

Synonyms:
- LFT
- Liver function tests

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
This panel includes Bilirubin, Total, Alkaline Phosphatase, ALT (alanine transaminase) and AST (aspartate transaminase).

Individual tests may be ordered separately.

CPT Codes:
- 82247
- 84075
- 84460
- 84450

LOINC Codes:
- 34543-9
- 6768-6
- 1742-6
- 1920-8
Liver Kidney Microsome Antibody
LKMAB

ORDERING

Performing Lab: Immunology
Performed: Wednesday, day shift
Methodology: Enzyme-Linked Immunosorbent Assay (ELISA)
Reported: 2-8 days
Additional Information: Presence of LKM-1 antibodies can be used in conjunction with clinical findings and other laboratory tests to aid in the diagnosis of autoimmune liver diseases such as autoimmune hepatitis (AIH-2).

Synonyms:
- LKM-1 Antibody
- Autoimmune hepatitis
- AIH-2

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): 2-8C serum up to 2 days; -20C or colder if longer than 2 days
Storage/Transport Temperature: -20C
Unacceptable Conditions: Microbial contamination, heat-treated, or specimens containing visible particulate should not be used. Grossly hemolysed, icteric or lipemic serum should be avoided.

PROCESSING

Test Code: LKMAB
Performing Lab: Immunology
Specimen Preparation: Freeze sample at -20C
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Unacceptable Conditions:
Microbial contamination, heat-treated, or specimens containing visible particulate should not be used. Grossly hemolysed, icteric or lipemic serum should be avoided.

Stability (from collection to initiation):
2-8°C serum up to 2 days; -20°C or colder if longer than 2 days

Storage/Transport Temperature:
-20°C

RESULT INTERPRETATION

Units:
Units
Reference Interval:
<20.0 Units

Additional Information:
Presence of LKM-1 antibodies can be used in conjunction with clinical findings and other laboratory tests to aid in the diagnosis of autoimmune liver diseases such as autoimmune hepatitis (AIH-2).

ADMINISTRATIVE

CPT Codes:
86376

LDT or Modified FDA:
47318-1

COMPLETE VIEW

Test Code:
LKMAB

Performing Lab:
Immunology

Performed:
Wednesday, day shift

Methodology:
Enzyme-Linked Immunosorbent Assay (ELISA)

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Microbial contamination, heat-treated, or specimens containing visible particulate should not be used. Grossly hemolysed, icteric or lipemic serum should be avoided.

Specimen Preparation:
Freeze sample at -20°C

Units:
Units

Reference Interval:
<20.0 Units

Synonyms:
- LKM-1 Antibody
- Autoimmune hepatitis
- AIH-2

**Storage/Transport Temperature:**

- -20°C

**Stability (from collection to initiation):**

2-8°C serum up to 2 days; -20°C or colder if longer than 2 days

**Reported:**

2-8 days

**Additional Information:**

Presence of LKM-1 antibodies can be used in conjunction with clinical findings and other laboratory tests to aid in the diagnosis of autoimmune liver diseases such as autoimmune hepatitis (AIH-2).

**CPT Codes:**

86376

**LDT or Modified FDA:**

47318-1
Lp-PLA2 Activity
LPP2A

ORDERING
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
3-8 days
Additional Information:
The Lp-PLA2 Activity assay may be useful for individuals at intermediate or high risk for developing coronary heart disease.

Additional Information: Lp-PLA2 Activity levels should be interpreted in conjunction with clinical findings and other diagnostic tests. This test does not replace blood cholesterol tests or other traditional risk factors identified for coronary heart disease or ischemic stroke.
Synonyms:
• Lipoprotein associated phospholipase A2

COLLECTION
Sample Type:
Serum
Collect:
Gold-top or Red-top tube
Amount to Collect:
2 mL whole blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
1. Collect and label sample according to standard protocols.
2. Gently invert tube 5 times immediately after draw. Do not shake.
3. Allow blood to clot 30 minutes.
4. Centrifuge at 1300 rcf for 10 minutes
Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: 21 days
Frozen: 21 days

PROCESSING
Test Code:
LPP2A
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 94117
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
- Room temperature: 7 days
- Refrigerated: 21 days
- Frozen: 21 days

RESULT INTERPRETATION

Units:
- nmol/min/mL

Reference Interval:
- <75

Additional Information:
The Lp-PLA2 Activity assay may be useful for individuals at intermediate or high risk for developing coronary heart disease.

Additional Information: Lp-PLA2 Activity levels should be interpreted in conjunction with clinical findings and other diagnostic tests. This test does not replace blood cholesterol tests or other traditional risk factors identified for coronary heart disease or ischemic stroke.

ADMINISTRATIVE

CPT Codes:
- 83698-90

COMPLETE VIEW

Test Code:
- LPP2A

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- LC/MS/MS

Remarks:
1. Collect and label sample according to standard protocols.
2. Gently invert tube 5 times immediately after draw. Do not shake.
3. Allow blood to clot 30 minutes.
4. Centrifuge at 1300 rcf for 10 minutes

Collect:
- Gold-top or Red-top tube

Amount to Collect:
- 2 mL whole blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Specimen Preparation:
- Aliquot and freeze sample. Transport to CB frozen. Order Quest test code 94117

Units:
- nmol/min/mL

Reference Interval:
- <75

Synonyms:
- Lipoprotein associated phospholipase A2

Stability (from collection to initiation):
Room temperature: 7 days  
Refrigerated: 21 days  
Frozen: 21 days  

**Reported:**  
3-8 days  

**Additional Information:**  
The Lp-PLA2 Activity assay may be useful for individuals at intermediate or high risk for developing coronary heart disease.

Additional Information: Lp-PLA2 Activity levels should be interpreted in conjunction with clinical findings and other diagnostic tests. This test does not replace blood cholesterol tests or other traditional risk factors identified for coronary heart disease or ischemic stroke.

**CPT Codes:**  
83698-90
LRF Test

ORDERING

Available Stat: No
Synonyms:
- LH
- FSH

COLLECTION

Remarks:
After collecting blood for baseline (0 time) FSH and LH levels, Luteinizing Releasing Factor is administered intravenously and additional samples are collected at intervals (e.g., 10, 20, 30, 60 and 90 min post-infusion) to determine the maximal (peak) value. For additional information regarding collection of samples and test performance see under LH and FSH.

COMPLETE VIEW

Available Stat: No
Remarks:
After collecting blood for baseline (0 time) FSH and LH levels, Luteinizing Releasing Factor is administered intravenously and additional samples are collected at intervals (e.g., 10, 20, 30, 60 and 90 min post-infusion) to determine the maximal (peak) value. For additional information regarding collection of samples and test performance see under LH and FSH.
Synonyms:
- LH
- FSH
Lupus Anticoagulant by HEXA

ORDERING

Ordering Recommendations:
When lupus anticoagulant testing is requested, it is appropriate to perform BOTH the RVVT and Lupus Anticoagulant by HEXA tests. For this reason, both will be performed whenever either is ordered. In the uncommon circumstance that a provider wishes to perform only one of these tests, the hematology laboratory should be contacted at 353-1747 to request that only the single test be performed.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Tuesday, day shift

Methodology:
Hexagonal Phospholipid Neutralization Test

Additional Information:
Summary of Interpretive Information for test results:
A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this lupus anticoagulant by HEXA, the RVVT-based assay is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

For detection of lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent. Persistent presence (> 3 months) of antiphospholipid antibodies has been associated with recurrent thrombosis syndromes. A review of testing performed on UCSF patients indicates that, of all patients diagnosed with Lupus Anticoagulants, approximately 50% are detected in both Hexagonal Phospholipid Neutralization and Russell's Viper Venom tests, 25% in only the Hexagonal Phospholipid Neutralization Test, and 25% in only the Russell's Viper Venom Test.

Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results.

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

Synonyms:
- LA
- antiphospholipid AB
- Anti-cardiolipin
- HEXA
- RVVT
- Russell's viper venom
- Hexagonal phospholipid neutralization
Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Bring specimen immediately to lab after collection.

For patients with Hct’s >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**NOTE:** Thrombin inhibitors (e.g. hirudin, argatroban) present in the sample to be tested may interfere in the test and lead to falsely positive results, for patients receiving such therapy please contact the Hematology lab (x3-1747) **BEFORE** collecting samples for testing.

Unacceptable Conditions:
Hemolysis, sample collected in glass tube. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**PROCESSING**

Test Code:
HEXA

Test Group:
Anti-phospholipid

Performing Lab:
Parnassus Hematology

Specimen Preparation:
Platelet poor plasma required and must be frozen within 4 hours of collection. **Note:** If Lupius Anticoagulant ordered without further specification order both HEXA and RVVTM

Preferred Volume:
1 mL plasma

Unacceptable Conditions:
Hemolysis, sample collected in glass tube. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**RESULT INTERPRETATION**

Reference Interval:
Negative

Additional Information:
Summary of Interpretive Information for test results:

A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this lupus anticoagulant by HEXA, the RVVT-based assay is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a
inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

For detection of lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent. Persistent presence (> 3 months) of antiphospholipid antibodies has been associated with recurrent thrombosis syndromes. A review of testing performed on UCSF patients indicates that, of all patients diagnosed with Lupus Anticoagulants, approximately 50% are detected in both Hexagonal Phospholipid Neutralization and Russell's Viper Venom tests, 25% in only the Hexagonal Phospholipid Neutralization Test, and 25% in only the Russell's Viper Venom Test.

Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

ADMINISTRATIVE

CPT Codes:
85597
LOINC Codes:
33930-9

COMPLETE VIEW

Available Stat:
No
Ordering Recommendations:
When lupus anticoagulant testing is requested, it is appropriate to perform BOTH the RVVT and Lupus Anticoagulant by HEXA tests. For this reason, both will be performed whenever either is ordered. In the uncommon circumstance that a provider wishes to perform only one of these tests, the hematology laboratory should be contacted at 353-1747 to request that only the single test be performed.

Test Code:
HEXA
Test Group:
Anti-phospholipid
Performing Lab:
Parnassus Hematology
Performed:
Tuesday, day shift
Methodology:
Hexagonal Phospholipid Neutralization Test
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
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4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap. Bring specimen immediately to lab after collection.

For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

NOTE: Thrombin inhibitors (e.g. hirudin, argatroban) present in the sample to be tested may interfere in the test and lead to falsely

Test information subject to change
positive results, for patients receiving such therapy please contact the Hematology lab (x3-1747) BEFORE collecting samples for testing.

Collect:

Blue top filled to full extent of vacuum

Amount to Collect:

2.7 mL blood

Sample Type:

Citrated plasma

Preferred Volume:

1 mL plasma

Unacceptable Conditions:

Hemolysis, sample collected in glass tube. Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:

Platelet poor plasma required and must be frozen within 4 hours of collection. Note: If Lupus Anticoagulant ordered without further specification order both HEXA and RVVT

Reference Interval:

Negative

Synonyms:

- LA
- antiphospholipid AB
- Anti-cardiolipin
- HEXA
- RVVT
- Russel's viper venom
- Hexagonal phospholipid neutralization

Additional Information:

Summary of Interpretive Information for test results:

A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this lupus anticoagulant by HEXA, the RVVT-based assay is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

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Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

CPT Codes:

85597
Lupus Anticoagulant Information

ORDERING

Available Stat:
No

Additional Information:
If “Lupus Anticoagulant” is ordered without further specification, a RVVTM and HEXA will be done.

The Russell's Viper Venom Test and the Hexagonal Phospholipid Neutralization test are 2 tests available to diagnose lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent.

Lupus anticoagulants along with anti-cardiolipin antibodies and anti-beta-2-glycoprotein antibodies are the three major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Anti-phospholipid Antibody Panel (APLA) be performed (as clinically indicated). This panel includes Russell Viper Venom Test (RVVTM), Hexagonal Phospholipid Neutralization Test (HEXA), and Anti-cardiolipin Antibody Tests (ACLG and ACLM), and Anti-beta-2-glycoprotein Antibody Tests (B2GPG and B2GPM).

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

Synonyms:
• LA
• antiphospholipid AB
• Anti-cardiolipin, HEXA
• RVVT
• Russell's viper venom
• Hexagonal phospholipids neutralization

PROCESSING

Test Code:
LUPUS
Test Group:
Anti-phospholipid
Specimen Preparation:
If “Lupus Anticoagulant” is ordered without further specification, order test package LUPUS which contains RVVTM & HEXA.

RESULT INTERPRETATION

Additional Information:
If “Lupus Anticoagulant” is ordered without further specification, a RVVTM and HEXA will be done.

The Russell's Viper Venom Test and the Hexagonal Phospholipid Neutralization test are 2 tests available to diagnose lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent.

Lupus anticoagulants along with anti-cardiolipin antibodies and anti-beta-2-glycoprotein antibodies are the three major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Anti-phospholipid Antibody Panel (APLA) be performed (as clinically indicated). This panel includes Russell Viper Venom Test (RVVTM), Hexagonal Phospholipid Neutralization Test (HEXA), and Anti-cardiolipin Antibody Tests (ACLG and ACLM), and Anti-beta-2-glycoprotein Antibody Tests (B2GPG and B2GPM).

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

ADMINISTRATIVE

CPT Codes:
Available Stat: No
Test Code: LUPUS
Test Group: Anti-phospholipid
Specimen Preparation:
If "Lupus Anticoagulant" is ordered without further specification, order test package LUPUS which contains RVVTM & HEXA.
Synonyms:
- LA
- antiphospholipid AB
- Anti-cardiolipin, HEXA
- RVVT
- Russell's viper venom
- Hexagonal phospholipids neutralization
Additional Information:
If “Lupus Anticoagulant” is ordered without further specification, a RVVTM and HEXA will be done.

The Russell’s Viper Venom Test and the Hexagonal Phospholipid Neutralization test are 2 tests available to diagnose lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent.

Lupus anticoagulants along with anti-cardiolipin antibodies and anti-beta-2-glycoprotein antibodies are the three major categories of anti-phospholipid antibodies. If a patient is being evaluated for anti-phospholipid antibody syndrome, the hematology laboratory service at Moffitt-Long recommends that the Anti-phospholipid Antibody Panel (APLA) be performed (as clinically indicated). This panel includes Russell Viper Venom Test (RVVTM), Hexagonal Phospholipid Neutralization Test (HEXA), and Anti-cardiolipin Antibody Tests (ACLG and ACLM), and Anti-beta-2-glycoprotein Antibody Tests (B2GPG and B2GPM).

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

CPT Codes:
85597, 85613
Luteinizing Hormone
LH

ORDERING

Ordering Recommendations:
This assay is suitable for use in adult patients to assess general endocrine function. For pediatric patients see entry for LH, Ultrasensitive.

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Thursday, Sunday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1-3 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 19% lower than the Centaur method. Please note that the reference ranges have changed.


Synonyms:
- LH
- gonadotropin tests
- Leuteinizing hormone

COLLECTION

Sample Type:
Serum

Collect:
Gold or Red top

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

PROCESSING

Test Code:
LH

Test Group:
LH
Performing Lab:
   China Basin Chemistry

Specimen Preparation:
   Aliquot and freeze serum at -20C.

Preferred Volume:
   0.3 mL serum

Minimum Volume:
   0.15 mL serum

Stability (from collection to initiation):
   Refrigerated (2-8°C): 7 days
   Frozen (-10°C or colder): 12 months

   If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

   Avoid multiple freeze-thaw cycles.

RESULT INTERPRETATION

Units:
   IU/L

Reference Interval:
   Adult males (>= 18 years): 0.6 - 12.1 IU/L

   Adult females (>= 18 years):

<table>
<thead>
<tr>
<th>Phase</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follicular Phase</td>
<td>1.8 - 11.8 IU/L</td>
</tr>
<tr>
<td>Mid-cycle Peak</td>
<td>7.6 - 89.1 IU/L</td>
</tr>
<tr>
<td>Luteal Phase</td>
<td>0.8 - 14.0 IU/L</td>
</tr>
<tr>
<td>Post-menopausal</td>
<td>5.2 - 62.0 IU/L</td>
</tr>
</tbody>
</table>

Reference range adopted from Abbott (vendor) based on in-house verification study of 23 male (18 years old) normal volunteers in the UCSF Laboratory and 20 split female sample comparisons with ARUP.

Additional Information:
   Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 19% lower than the Centaur method. Please note that the reference ranges have changed.


ADMINISTRATIVE

CPT Codes:
   83002

LOINC Codes:
   10501-5

COMPLETE VIEW

Available Stat:
   No

Ordering Recommendations:
   This assay is suitable for use in adult patients to assess general endocrine function. For pediatric patients see entry for LH, Ultrasensitive.

Test Code:
   LH

Test Group:
   LH

Performing Lab:
   China Basin Chemistry
Performed:
Thursday, Sunday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
Gold or Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Units:
IU/L

Reference Interval:
Adult males (>= 18 years): 0.6 - 12.1 IU/L

Adult females (>= 18 years):
- Follicular Phase: 1.8 - 11.8 IU/L
- Mid-cycle Peak: 7.6 - 89.1 IU/L
- Luteal Phase: 0.6 - 14.0 IU/L
- Post-menopausal: 5.2 - 62.0 IU/L

Reference range adopted from Abbott (vendor) based on in-house verification study of 23 male (18 years old) normal volunteers in the UCSF Laboratory and 20 split female sample comparisons with ARUP.

Synonyms:
- LH
- gonadotropin tests
- Leuteinizing hormone

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

Reported:
1-3 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/27/17. The Abbott Architect method reads approximately 19% lower than the Centaur method. Please note that the reference ranges have changed.


CPT Codes:
83002

LOINC Codes:
10501-5
Luteinizing hormone, Pediatric
PLH

ORDERING

Approval Required:
Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

Available Stat:
No

Performing Lab:
Esoterix

Methodology:
ICMA

Reported:
Test performed Tuesday and Friday. Turnaround time: 2-6 days.

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Luteinizing Hormone" (test code LH). It requires approval if ordered in patients over the age of 20.

Synonyms:
- LH
- gonadotropin tests
- Leuteinizing hormone
- LH Ultrasensitive
- LH Pediatric

COLLECTION

Sample Type:
Serum

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

PROCESSING

Test Code:
PLH

Test Group:
LH

Sendout:
Yes

Performing Lab:
Esoterix

Specimen Preparation:
Freeze at -20°C. Specify age and sex on request form. Order Esoterix #500234

Preferred Volume:
1 mL serum

Minimum Volume:
**RESULT INTERPRETATION**

**Units:**
- mIU/mL

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Female (mIU/mL)</th>
<th>Male (mIU/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 weeks - 11 months</td>
<td>0.02 - 7.0</td>
<td>0.02 - 0.3</td>
</tr>
<tr>
<td>12 months - 8 years</td>
<td>0.02 - 0.3</td>
<td>0.02 - 0.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (mIU/mL)</th>
<th>Female (mIU/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early puberty</td>
<td>0.2 - 5.0</td>
<td>0.02 - 12.0</td>
</tr>
<tr>
<td>Late puberty</td>
<td>0.4 - 7.0</td>
<td>0.4 - 11.7</td>
</tr>
</tbody>
</table>

**Puberty**

<table>
<thead>
<tr>
<th>Tanner Stage</th>
<th>Age (years)</th>
<th>Female (mIU/mL)</th>
<th>Male (mIU/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;9.2</td>
<td>0.02 - 0.18</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9.2 - 13.7</td>
<td>0.02 - 4.7</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10.0 - 14.4</td>
<td>0.10 - 12.0</td>
<td></td>
</tr>
<tr>
<td>4 - 5</td>
<td>10.7 - 18.6</td>
<td>0.4 - 11.7</td>
<td></td>
</tr>
</tbody>
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<thead>
<tr>
<th>Tanner Stage</th>
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<th>Male (mIU/mL)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;9.8</td>
<td>0.02 - 0.3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9.8 - 14.5</td>
<td>0.2 - 4.9</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10.7 - 15.4</td>
<td>0.2 - 5.0</td>
<td></td>
</tr>
<tr>
<td>4 - 5</td>
<td>11.8 - 17.3</td>
<td>0.4 - 7.0</td>
<td></td>
</tr>
</tbody>
</table>

**Adult Males | mIU/mL**
- 1.5 - 9.0

**Adult Females | mIU/mL**
- Follicular: 2.0 - 9.0
- Mid-cycle peak: 18.0 - 49.0
- Luteal: 2.0 - 11.0
- Postmenopausal: 20.0 - 70.0

**Additional Information:**
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Luteinizing Hormone" (test code LH). It requires approval if ordered in patients over the age of 20.

**ADMINISTRATIVE**

**CPT Codes:**
- 83002-90

**LOINC Codes:**
- 10501-5

**COMPLETE VIEW**

**Approval Required:**
- Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

**Available Stat:**
- No

**Test Code:**
- PLH

**Test Group:**
- LH
Performing Lab: Esoterix
Sendout: Yes
Methodology: ICMA
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Specimen Preparation:
Freeze at -20°C. Specify age and sex on request form. Order Esoterix #500234
Units: mIU/mL
Reference Interval:

<table>
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<tr>
<th>Age</th>
<th>mIU/mL (Male and Female)</th>
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<tr>
<td></td>
<td>Female (mIU/mL) 0.02 - 12.0</td>
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<tr>
<td>Late puberty</td>
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</tr>
<tr>
<td></td>
<td>Male (mIU/mL) 0.4 - 7.0</td>
</tr>
<tr>
<td></td>
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Puberty

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<tr>
<td>2</td>
<td>9.8 - 14.5</td>
<td>0.2 - 4.9</td>
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<tr>
<td>3</td>
<td>10.7 - 15.4</td>
<td>0.2 - 5.0</td>
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<td>4 - 5</td>
<td>11.8 - 17.3</td>
<td>0.4 - 7.0</td>
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<table>
<thead>
<tr>
<th>Age</th>
<th>mIU/mL</th>
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<tr>
<td>Adult Males</td>
<td>1.5 - 9.0</td>
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<table>
<thead>
<tr>
<th>Adult Females</th>
<th>mIU/mL</th>
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<tr>
<td>Follicular</td>
<td>2.0 - 9.0</td>
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<tr>
<td>Mid-cycle peak</td>
<td>18.0 - 49.0</td>
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<tr>
<td>Luteal</td>
<td>2.0 - 11.0</td>
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<tr>
<td>Postmenopausal</td>
<td>20.0 - 70.0</td>
</tr>
</tbody>
</table>

Synonyms:
- LH
- gonadotropin tests
- Leuteinizing hormone
- LH Ultrasensitive
- LH Pediatric
Reported:
Test performed Tuesday and Friday. Turnaround time: 2-6 days.

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Luteinizing Hormone" (test code LH). It requires approval if ordered in patients over the age of 20.

CPT Codes:
83002-90

LOINC Codes:
10501-5
Lyme Disease Ab Confirmation (WB)
LYMEWB

ORDERING

Ordering Recommendations:
This test is for confirmation of positive antibody tests (LYMET). It should not be used as the first line diagnostic.

Available Stat:
No

Performing Lab:
Quest

Methodology:
Western blot

Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:
Western blot testing is automatically performed on samples that are positive on EIA for confirmation.

IgG Western Blot strips which have 5 (or more) of the 10 significant bands are considered positive for specific antibody to B. burgdorferi. IgM Western blot strips which have 2 (or more) of the 3 significant bands are considered positive for specific antibody to B. burgdorferi. The bands will be reported under a "See Separate Report". Caution must be used in supporting a diagnosis of B. burgdorferi infection when sera are Western blot IgM positive and Western blot IgG negative after the initial 4 week period from onset. Because the likelihood of a false-positive test result is high for these individuals, a positive IgM test alone is not recommended for use in determining active disease in persons with illness of longer than one month duration.

Synonyms:
- Relapsing fever
- Borreliosis
- Borrelia burgdorferi Ab
- Borrelia burgdorferi antibody

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL serum

Minimum Volume:
1 mL serum

PROCESSING

Test Code:
LYMEWB

Test Group:
Borrelia burgdorferi

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Refrigerate sample.

LYMEWB should only be ordered by Immunology staff as a reflex test for patients with a positive LYMET result.

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

### RESULT INTERPRETATION

**Reference Interval:**
- Negative

**Additional Information:**
Western blot testing is automatically performed on samples that are positive on EIA for confirmation.

IgG Western Blot strips which have 5 (or more) of the 10 significant bands are considered positive for specific antibody to B. burgdorferi. IgM Western blot strips which have 2 (or more) of the 3 significant bands are considered positive for specific antibody to B. burgdorferi. The bands will be reported under a “See Separate Report”. Caution must be used in supporting a diagnosis of B. burgdorferi infection when sera are Western blot IgM positive and Western blot IgG negative after the initial 4 week period from onset. Because the likelihood of a false-positive test result is high for these individuals, a positive IgM test alone is not recommended for use in determining active disease in persons with illness of longer than one month duration.

### ADMINISTRATIVE

**CPT Codes:**
- 86617-90 x 2

**LOINC Codes:**
- 9587-7

### COMPLETE VIEW

**Available Stat:**
- No

**Ordering Recommendations:**
- This test is for confirmation of positive antibody tests (LYMET). It should not be used as the first line diagnostic.

**Test Code:**
- LYMEWB

**Test Group:**
- Borrelia burgdorferi

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Western blot

**Collect:**
- Gold top

**Amount to Collect:**
- 4 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Specimen Preparation:**
Refrigerate sample.

LYMEWB should only be ordered by Immunology staff as a reflex test for patients with a positive LYMET result.

Reference Interval:

Negative

Synonyms:

- Relapsing fever
- Borreliosis
- Borrelia burgdorferi Ab
- Borrelia burgdorferi antibody

Reported:

Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:

Western blot testing is automatically performed on samples that are positive on EIA for confirmation.

IgG Western Blot strips which have 5 (or more) of the 10 significant bands are considered positive for specific antibody to B. burgdorferi. IgM Western blot strips which have 2 (or more) of the 3 significant bands are considered positive for specific antibody to B. burgdorferi. The bands will be reported under a “See Separate Report”. Caution must be used in supporting a diagnosis of B. burgdorferi infection when sera are Western blot IgM positive and Western blot IgG negative after the initial 4 week period from onset. Because the likelihood of a false-positive test result is high for these individuals, a positive IgM test alone is not recommended for use in determining active disease in persons with illness of longer than one month duration.

CPT Codes:

86617-90 x 2

LOINC Codes:

9587-7
Lyme Disease Antibody Total
LYMET

ORDERING

Ordering Recommendations:
Laboratory diagnosis of suspected Lyme disease is best performed through serology testing. PCR very rarely detects organisms, even in clinical Lyme disease, and is typically not indicated. Positive bloodstream antibodies do not necessarily indicate active Lyme disease, but do indicate previous exposure. Positive antibody testing is automatically confirmed with Western Blot.

Most patients with CNS Lyme disease have high levels of bloodstream antibodies; therefore testing of CSF for Lyme antibodies is typically only indicated for patients with positive serology. PCR for Lyme organisms in CSF has very low sensitivity for CNS disease.

Available Stat:
No

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent immunoassay

Reported:
1-4 days.

Additional Information:
A negative result on this test should be followed up in two to four weeks if lyme disease is still suspected. A negative result does not rule out infection with Borrelia Burgdorferi.

Due to recommendations by the FDA, all positive or equivocal Borrelia Burgdorferi antibody EIA (screening) tests will be followed by the relevant western blot.

The screening test for B. Burgdorferi has a low negative predictive value result when used to detect early infection and a low positive predictive value when exposure history, symptoms, and clinical findings are not consistent with Lyme disease.

Positive or equivocal results should not be interpreted as true positives until a second-step testing of the specimen is done using method that is more specific for antibodies to B. Burgdorferi (e.g. western blot). The patient will be billed an additional charge if the Lyme Disease by Western Blot is performed.

Reflex Testing:
Western Blot confirmation is automatically performed on all EIA positive tests.

Synonyms:
- Borreliosis
- Borrelia burgdorferi Ab
- Borrelia burgdorferi Antibody

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
3 mL blood

Preferred Volume:
1.5 mL serum

Minimum Volume:
0.5 mL serum
**PROCESSING**

**Test Code:**
LYMET

**Test Group:**
Borrelia burgdorferi

**Performing Lab:**
Immunology

**Specimen Preparation:**
Freeze serum at -20C

**Preferred Volume:**
1.5 mL serum

**Minimum Volume:**
0.5 mL serum

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
A negative result on this test should be followed up in two to four weeks if Lyme disease is still suspected. A negative result does not rule out infection with Borrelia Burgdorferi.

Due to recommendations by the FDA, all positive or equivocal Borrelia Burgdorferi antibody EIA (screening) tests will be followed by the relevant western blot.

The screening test for B. Burgdorferi has a low negative predictive value result when used to detect early infection and a low positive predictive value when exposure history, symptoms, and clinical findings are not consistent with Lyme disease.

Positive or equivocal results should not be interpreted as true positives until a second-step testing of the specimen is done using method that is more specific for antibodies to B. Burgdorferi (e.g. western blot). The patient will be billed an additional charge if the Lyme Disease by Western Blot is performed.

**ADMINISTRATIVE**

**CPT Codes:**
86618

**LOINC Codes:**
22131-7

**COMPLETE VIEW**

**Available Stat:**
No

**Ordering Recommendations:**
Laboratory diagnosis of suspected Lyme disease is best performed through serology testing. PCR very rarely detects organisms, even in clinical Lyme disease, and is typically not indicated. Positive bloodstream antibodies do not necessarily indicate active Lyme disease, but do indicate previous exposure. Positive antibody testing is automatically confirmed with Western Blot.

Most patients with CNS Lyme disease have high levels of bloodstream antibodies; therefore testing of CSF for Lyme antibodies is typically only indicated for patients with positive serology. PCR for Lyme organisms in CSF has very low sensitivity for CNS disease.

**Test Code:**
LYMET

**Test Group:**
Borrelia burgdorferi

**Performing Lab:**
Immunology
Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent immunoassay

Collect:
Gold top

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
1.5 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze serum at -20°C

Reference Interval:
Negative

Synonyms:
- Borrelia burgdorferi Ab
- Borrelia burgdorferi Antibody

Reported:
1-4 days.

Reflex Testing:
Western Blot confirmation is automatically performed on all EIA positive tests.

Additional Information:
A negative result on this test should be followed up in two to four weeks if lyme disease is still suspected. A negative result does not rule out infection with Borrelia Burgdorferi.

Due to recommendations by the FDA, all positive or equivocal Borrelia Burgdorferi antibody EIA (screening) tests will be followed by the relevant western blot.

The screening test for B. Burgdorferi has a low negative predictive value result when used to detect early infection and a low positive predictive value when exposure history, symptoms, and clinical findings are not consistent with lyme disease.

Positive or equivocal results should not be interpreted as true positives until a second-step testing of the specimen is done using method that is more specific for antibodies to B. Burgdorferi (e.g. western blot). The patient will be billed an additional charge if the Lyme Disease by Western Blot is performed.

CPT Codes:
86618

LOINC Codes:
22131-7
### Lyme Disease Antibody, CSF

**LYMC**

#### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Immunoblot

**Reported:**
- 5-7 days

**Additional Information:**
- No interpretive criteria for Borrelia burgdorferi Western blot have been established for CSF or other fluids. The presence of B. burgdorferi reactive antibodies in fluids may represent either compartmental antibody production or transudation of plasma antibody. The Western blot test will confirm the presence of B. burgdorferi specific antibodies detected by serologic screening methods (ELISA, IFA).

**Synonyms:**
- Borreliosis
- Borrelia burgdorferi Ab
- Borrelia burgdorferi Antibody

#### COLLECTION

**Sample Type:**
- CSF

**Collect:**
- CSF tube or sterile collection tube

**Amount to Collect:**
- 2 mL CSF

**Preferred Volume:**
- 2 mL CSF

**Minimum Volume:**
- 0.5 mL CSF

**Stability (from collection to initiation):**
- Refrigerated 1 week, frozen 1 month

#### PROCESSING

**Test Code:**
- LYM C

**Test Group:**
- Borrelia burgdorferi

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Freeze sample and ship to CB frozen.

**Preferred Volume:**
- 2 mL CSF

**Minimum Volume:**
- 0.5 mL CSF
Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
No bands detected

Additional Information:
No interpretive criteria for Borrelia burgdorferi Western blot have been established for CSF or other fluids. The presence of B. burgdorferi reactive antibodies in fluids may represent either compartmental antibody production or transudation of plasma antibody. The Western blot test will confirm the presence of B. burgdorferi specific antibodies detected by serologic screening methods (ELISA, IFA).

ADMINISTRATIVE

CPT Codes:
86617-90 x2

COMPLETE VIEW

Available Stat:
No

Test Code:
LYMC

Test Group:
Borrelia burgdorferi

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoblot

Collect:
CSF tube or sterile collection tube

Amount to Collect:
2 mL CSF

Sample Type:
CSF

Preferred Volume:
2 mL CSF

Minimum Volume:
0.5 mL CSF

Specimen Preparation:
Freeze sample and ship to CB frozen.

Reference Interval:
No bands detected

Synonyms:
- Borreliosis
- Borrelia burgdorferi Ab
- Borrelia burgdorferi Antibody

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

Reported:
5-7 days
Additional Information:

No interpretive criteria for Borrelia burgdorferi Western blot have been established for CSF or other fluids. The presence of B. burgdorferi reactive antibodies in fluids may represent either compartmental antibody production or transudation of plasma antibody. The Western blot test will confirm the presence of B. burgdorferi specific antibodies detected by serologic screening methods (ELISA, IFA).

CPT Codes:

86617-90 x2
Lyme Disease DNA, Qualitative
MOLT

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: RT-PCR
Reported: 3-5 days
Additional Information: The diagnosis of Lyme disease is most often made by clinical examination combined with evidence of tick bite or exposure in endemic areas. Amplification of Borrelia genomic DNA from blood or fluids can support the diagnosis.
Synonyms:
- Borreliosis
- Borrelia burgdorferi

COLLECTION

Sample Type: EDTA Whole blood, CSF or synovial fluid
Collect:
- Blood: Lavender top
- CSF/Synovial fluid: Sterile container
Amount to Collect: 1 mL blood or fluid
Preferred Volume: 1 mL blood or fluid
Minimum Volume: 0.5 mL blood or fluid
Stability (from collection to initiation):
- Blood: Room temperature 2 days, refrigerated 1 week
- Fluid: Room temperature 2 days, refrigerated 1 week, frozen 1 month
Rejection Criteria:
- Frozen blood sample received

PROCESSING

Test Code: MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Sendout: Yes
Performing Lab: Focus via Quest
Specimen Preparation:
- Refrigerate whole blood samples, send to CB refrigerated. Order Quest code 15777.
- Freeze CSF/Synovial fluid samples, send to CB frozen. Order Quest code 15564
Preferred Volume: 1 mL blood or fluid
Minimum Volume:
0.5 mL blood or fluid

Rejection Criteria:
- Frozen blood sample received

Stability (from collection to initiation):
- Blood: Room temperature 2 days, refrigerated 1 week
- Fluid: Room temperature 2 days, refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
- Not detected

Additional Information:
The diagnosis of Lyme disease is most often made by clinical examination combined with evidence of tick bite or exposure in endemic areas. Amplification of Borrelia genomic DNA from blood or fluids can support the diagnosis.

ADMINISTRATIVE

CPT Codes:
- 87081-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
- Focus via Quest

Sendout:
- Yes

Methodology:
- RT-PCR

Collect:
- Blood: Lavender top
- CSF/Synovial fluid: Sterile container

Amount to Collect:
- 1 mL blood or fluid

Sample Type:
- EDTA Whole blood, CSF or synovial fluid

Preferred Volume:
- 1 mL blood or fluid

Minimum Volume:
- 0.5 mL blood or fluid

Rejection Criteria:
- Frozen blood sample received

Specimen Preparation:
- Refrigerate whole blood samples, send to CB refrigerated. Order Quest code 15777.

- Freeze CSF/Synovial fluid samples, send to CB frozen. Order Quest code 15564

Reference Interval:
- Not detected

Synonyms:
- Borreliosis
- Borrelia burgdorferi

Stability (from collection to initiation):
Blood: Room temperature 2 days, refrigerated 1 week
Fluid: Room temperature 2 days, refrigerated 1 week, frozen 1 month

Reported:
3-5 days

Additional Information:
The diagnosis of Lyme disease is most often made by clinical examination combined with evidence of tick bite or exposure in endemic areas. Amplification of Borrelia genomic DNA from blood or fluids can support the diagnosis.

CPT Codes:
87081-90
Lymphocyte Antigen Stimulation
LPAG

ORDERING

Available Stat:  
No
Performing Lab:  
Mayo
Methodology:  
Flow cytometry
Reported:  
10-12 days.

Additional Information:  
Abnormal test results to antigen stimulation are indicative of impaired T-cell function, if T-cell counts are normal or only modestly decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with underrepresentation of T cells within the peripheral blood mononuclear cells (PBMC) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts. In the case of antigen-specific T-cell responses to tetanus toxoid (TT), there can be absent responses due to natural waning of cellular immunity, if the interval between vaccinations has exceeded the recommended period, especially in adults. In such circumstances, it would be appropriate to measure TT-specific T-cell responses 4 to 6 weeks after a booster vaccination.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to antigens can be regarded as a more sensitive, but less specific, test for the diagnosis of infection susceptibility.

It should also be kept in mind that there is no single laboratory test that can identify or define impaired cellular immunity, with the exception of an opportunistic infection.

Controls in this laboratory and most clinical laboratories are healthy adults. Since this test is used for screening and evaluating cellular immune dysfunction in infants and children, it is reasonable to question the comparability of proliferative responses between healthy infants, children, and adults. It is reasonable to expect robust T-cell-specific responses to TT in children without cellular immune compromise, as a result of repeated childhood vaccinations. The response to Candida albicans can be more variable depending on the extent of exposure and age of exposure. A comment will be provided in the report documenting the comparison of pediatric results with an adult reference range and correlation with clinical context for appropriate interpretation.

It should be noted that without obtaining formal pediatric reference values, it remains a possibility that the response in infants and children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

Synonyms:
- Lymphocyte stimulation
- lymphocyte antigen proliferation
- lymphocyte proliferation, SCIDS
- Severe combined immunodeficiency syndrome
- C. albicans
- Candida albicans
- tetanus toxoid

COLLECTION

Sample Type:  
Heparinized whole blood
Collect:  
Dark Green top
Amount to Collect:
  6 mL blood

Preferred Volume:
  6 mL blood

Minimum Volume:
  >= 18 year olds: 6 mL blood
  Children: 3 mL blood

Remarks:
  Collect blood Monday through Thursday only.

Specimen must be maintained at room temperature. Do not refrigerate or freeze.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Specimens must arrive at Mayo laboratories within 24 hours of collection, therefore samples must be drawn and delivered to UCSF laboratory by 12:00 noon to meet processing deadline.

For Brown & Toland patients Authorization from B&T is required before samples are collected.

Unacceptable Conditions:
  Samples collected outside of stated time frames

PROCESSING

Test Code:
  LPAG

Sendout:
  Yes

Performing Lab:
  Mayo

Specimen Preparation:
  Specimen must be maintained at room temperature. Do not refrigerate or freeze.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Please notify China Basin Sendout to expedite processing of whole blood specimens (Dark Green tubes) at 3-1349 or 3-4840 upon receipt.

Preferred Volume:
  6 mL blood

Minimum Volume:
  >= 18 year olds: 6 mL blood
  Children: 3 mL blood

Unacceptable Conditions:
  Samples collected outside of stated time frames

RESULT INTERPRETATION

Reference Interval:
  Viability of lymphocytes at day 0  >= 75.0%
  Maximum proliferation of Candida albicans as % CD45  >= 5.7%
  Maximum proliferation of Candida albicans as % CD3  >= 3.0%
  Maximum proliferation of tetanus toxoid as % CD45  >= 5.2%
  Maximum proliferation of tetanus toxoid as % CD3  >= 3.3%

Additional Information:
  Abnormal test results to antigen stimulation are indicative of impaired T-cell function, if T-cell counts are normal or only modestly decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with underrepresentation of T cells within the peripheral blood mononuclear cells (PBMC) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts. In the case of antigen-specific T-cell responses to tetanus toxoid (TT), there can be absent responses due to natural waning of cellular immunity, if the interval between vaccinations has exceeded the recommended period, especially in adults. In such circumstances, it would be appropriate to
measure TT-specific T-cell responses 4 to 6 weeks after a booster vaccination.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to antigens can be regarded as a more sensitive, but less specific, test for the diagnosis of infection susceptibility.

It should also be kept in mind that there is no single laboratory test that can identify or define impaired cellular immunity, with the exception of an opportunistic infection.

Controls in this laboratory and most clinical laboratories are healthy adults. Since this test is used for screening and evaluating cellular immune dysfunction in infants and children, it is reasonable to question the comparability of proliferative responses between healthy infants, children, and adults. It is reasonable to expect robust T-cell-specific responses to TT in children without cellular immune compromise, as a result of repeated childhood vaccinations. The response to Candida albicans can be more variable depending on the extent of exposure and age of exposure. A comment will be provided in the report documenting the comparison of pediatric results with an adult reference range and correlation with clinical context for appropriate interpretation.

It should be noted that without obtaining formal pediatric reference values, it remains a possibility that the response in infants and children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

**ADMINISTRATIVE**

CPT Codes:
- 86353-90

**COMPLETE VIEW**

Available Stat: No
Test Code: LPAG
Performing Lab: Mayo
Sendout: Yes
Methodology: Flow cytometry
Remarks:
- Collect blood Monday through Thursday only.
- Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.
- Specimens must arrive at Mayo laboratories within 24 hours of collection, therefore samples must be drawn and delivered to UCSF laboratory by 12:00 noon to meet processing deadline.

For Brown & Toland patients Authorization from B&T is required before samples are collected.

Collect:
- Dark Green top
Amount to Collect:
- 6 mL blood
Sample Type:
- Heparinized whole blood
Preferred Volume:
- 6 mL blood
Minimum Volume:
- >= 18 year olds: 6 mL blood
- Children: 3 mL blood
Unacceptable Conditions:
Samples collected outside of stated time frames

**Specimen Preparation:**
- Specimen must be maintained at room temperature. Do not refrigerate or freeze.
- Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.
- Please notify China Basin Sendout to expedite processing of whole blood specimens (Dark Green tubes) at 3-1349 or 3-4840 upon receipt.

**Reference Interval:**
- Viability of lymphocytes at day 0 \(\geq 75.0\%\)
- Maximum proliferation of Candida albicans as % CD45 \(\geq 5.7\%\)
- Maximum proliferation of Candida albicans as % CD3 \(\geq 3.0\%\)
- Maximum proliferation of tetanus toxoid as % CD45 \(\geq 5.2\%\)
- Maximum proliferation of tetanus toxoid as % CD3 \(\geq 3.3\%\)

**Synonyms:**
- Lymphocyte stimulation
- Lymphocyte antigen proliferation
- Lymphocyte proliferation, SCIDS
- Severe combined immunodeficiency syndrome
- C. albicans
- Candida albicans
- tetanus toxoid

**Reported:**
10-12 days.

**Additional Information:**
Abnormal test results to antigen stimulation are indicative of impaired T-cell function, if T-cell counts are normal or only modestly decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with underrepresentation of T cells within the peripheral blood mononuclear cells (PBMC) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts. In the case of antigen-specific T-cell responses to tetanus toxoid (TT), there can be absent responses due to natural waning of cellular immunity, if the interval between vaccinations has exceeded the recommended period, especially in adults. In such circumstances, it would be appropriate to measure TT-specific T-cell responses 4 to 6 weeks after a booster vaccination.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to antigens can be regarded as a more sensitive, but less specific, test for the diagnosis of infection susceptibility.

It should also be kept in mind that there is no single laboratory test that can identify or define impaired cellular immunity, with the exception of an opportunistic infection.

Controls in this laboratory and most clinical laboratories are healthy adults. Since this test is used for screening and evaluating cellular immune dysfunction in infants and children, it is reasonable to question the comparability of proliferative responses between healthy infants, children, and adults. It is reasonable to expect robust T-cell-specific responses to TT in children without cellular immune compromise, as a result of repeated childhood vaccinations. The response to Candida albicans can be more variable depending on the extent of exposure and age of exposure. A comment will be provided in the report documenting the comparison of pediatric results with an adult reference range and correlation with clinical context for appropriate interpretation.

It should be noted that without obtaining formal pediatric reference values, it remains a possibility that the response in infants and children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

**CPT Codes:**
86353-90
Lymphocyte Mitogen Stimulation
LPMG

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Flow cytometry
Reported:
10-12 days.

Additional Information:
Abnormal test results to mitogen stimulation are indicative of impaired T-cell function if T-cell counts are normal or only modestly decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with under-representation of T cells within the peripheral blood mononuclear cells (PBMCs) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to mitogens can be regarded as a more specific but less sensitive test for the diagnosis of infection susceptibility.

It should also be kept in mind that there is no single laboratory test that can identify or define impaired cellular immunity, with the exception of an opportunistic infection.

Controls in this laboratory and most clinical laboratories are healthy adults. Since this test is used for screening and evaluating cellular immune dysfunction in infants and children, it is reasonable to question the comparability of proliferative responses between healthy infants, children, and adults. One study has reported that the highest mitogen responses are seen in newborn infants with subsequent decline to 6 months of age, and a continuing decline through adolescence to half the neonatal response.(6) In our evaluation of 43 pediatric specimens (of all ages) with adult normal controls, only 21% and 14% were below the tenth percentile of the adult reference range for pokeweed (PWM) and phytohemagglutinin (PHA), respectively. A comment will be provided in the report documenting the comparison of pediatric results with an adult reference range and correlation with clinical context for appropriate interpretation.

It should be noted that without obtaining formal pediatric reference values it remains a possibility that the response in infants and children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

Lymphocyte proliferation responses to mitogens and antigens are significantly affected by time elapsed since blood collection. Results have been shown to be variable for specimens assessed >24 and <48 hours postblood collection, therefore, lymphocyte proliferation results must be interpreted with due caution and results should be correlated with clinical context.

Synonyms:
- Lymphocyte proliferation
- pokeweed mitogen
- PWM
- phytohemagglutinin
- PHA
- Lymphocyte stimulation
- lymphocyte proliferation
- SCIDS
- Severe combined immunodeficiency syndrome

COLLECTION
Sample Type:
Heparinized whole blood

Collect:
Dark Green top

Amount to Collect:
6 mL blood from patient

Preferred Volume:
6 mL blood

Minimum Volume:
>= 18 year olds: 6 mL blood
Children: 3 mL blood

Remarks:
Collect blood Monday through Thursday only.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Specimens must arrive at Mayo laboratories within 24 hours of collection, therefore samples must be drawn and delivered to UCSF laboratory by 12:00 noon to meet processing deadline.

For Brown & Toland patients Authorization from B&T is required before samples are collected.

Unacceptable Conditions:
Samples collected outside of stated time frames

PROCESSING

Test Code:
LPMG

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Specimen must be maintained at room temperature. Do not refrigerate or freeze.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Please notify China Basin Sendout to expedite processing of whole blood specimens (Dark Green tubes) at 3-1349 or 3-4840 upon receipt.

Preferred Volume:
6 mL blood

Minimum Volume:
>= 18 year olds: 6 mL blood
Children: 3 mL blood

Unacceptable Conditions:
Samples collected outside of stated time frames

RESULT INTERPRETATION

Reference Interval:
Viability of lymphocytes at day 0  >= 75.0%
Maximum proliferation of phytohemagglutinin as % CD45 >= 49.9%
Maximum proliferation of phytohemagglutinin as % CD3  >= 58.5%
Maximum proliferation of pokeweed mitogen as % CD45  >= 4.5%
Maximum proliferation of pokeweed mitogen as % CD3  >= 3.5%
Maximum proliferation of pokeweed mitogen as % CD19  >= 3.9%

Additional Information:
Abnormal test results to mitogen stimulation are indicative of impaired T-cell function if T-cell counts are normal or only modestly
decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with under-representation of T cells within the peripheral blood mononuclear cells (PBMCs) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to mitogens can be regarded as a more specific but less sensitive test for the diagnosis of infection susceptibility.

It should also be kept in mind that there is no single laboratory test that can identify or define impaired cellular immunity, with the exception of an opportunistic infection.

Controls in this laboratory and most clinical laboratories are healthy adults. Since this test is used for screening and evaluating cellular immune dysfunction in infants and children, it is reasonable to question the comparability of proliferative responses between healthy infants, children, and adults. One study has reported that the highest mitogen responses are seen in newborn infants with subsequent decline to 6 months of age, and a continuing decline through adolescence to half the neonatal response.(6) In our evaluation of 43 pediatric specimens (of all ages) with adult normal controls, only 21% and 14% were below the tenth percentile of the adult reference range for pokeweed (PWM) and phytohemagglutinin (PHA), respectively. A comment will be provided in the report documenting the comparison of pediatric results with an adult reference range and correlation with clinical context for appropriate interpretation.

It should be noted that without obtaining formal pediatric reference values it remains a possibility that the response in infants and children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

Lymphocyte proliferation responses to mitogens and antigens are significantly affected by time elapsed since blood collection. Results have been shown to be variable for specimens assessed >24 and <48 hours postblood collection, therefore, lymphocyte proliferation results must be interpreted with due caution and results should be correlated with clinical context.

---

**ADMINISTRATIVE**

**CPT Codes:**

86353-90

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

LPMG

**Performing Lab:**

Mayo

**Sendout:**

Yes

**Methodology:**

Flow cytometry

**Remarks:**

Collect blood Monday through Thursday only.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Specimens must arrive at Mayo laboratories within 24 hours of collection, therefore samples must be drawn and delivered to UCSF laboratory by 12:00 noon to meet processing deadline.

For Brown & Toland patients Authorization from B&T is **required before** samples are collected.

**Collect:**

Dark Green top

**Amount to Collect:**

6 mL blood from patient

**Sample Type:**
Heparinized whole blood

**Preferred Volume:**
6 mL blood

**Minimum Volume:**
>= 18 year olds: 6 mL blood
Children: 3 mL blood

**Unacceptable Conditions:**
Samples collected outside of stated time frames

**Specimen Preparation:**
Specimen must be maintained at room temperature. Do not refrigerate or freeze.

Specimen must be received for sendout at China Basin by 3:30 pm on day of collection.

Please notify China Basin Sendout to expedite processing of whole blood specimens (Dark Green tubes) at 3-1349 or 3-4840 upon receipt.

**Reference Interval:**

- Viability of lymphocytes at day 0: >= 75.0%
- Maximum proliferation of phytohemagglutinin as % CD45: >= 49.9%
- Maximum proliferation of phytohemagglutinin as % CD3: >= 58.5%
- Maximum proliferation of pokeweed mitogen as % CD45: >= 4.5%
- Maximum proliferation of pokeweed mitogen as % CD3: >= 3.5%
- Maximum proliferation of pokeweed mitogen as % CD19: >= 3.9%

**Synonyms:**
- Lymphocyte proliferation
- pokeweed mitogen
- PWM
- phytohemagglutinin
- PHA
- Lymphocyte stimulation
- lymphocyte proliferation
- SCIDS
- Severe combined immunodeficiency syndrome

**Reported:**
10-12 days.

**Additional Information:**
Abnormal test results to mitogen stimulation are indicative of impaired T-cell function if T-cell counts are normal or only modestly decreased. If there is profound T-cell lymphopenia, it must be kept in mind that there could be a "dilution" effect with under-representation of T cells within the peripheral blood mononuclear cells (PBMCs) population that could result in lower T-cell proliferative responses. However, this is not a significant concern in the flow cytometry assay, since acquisition of additional cellular events during analysis can compensate for artificial reduction in proliferation due to lower T-cell counts.

There is no absolute correlation between T-cell proliferation in vitro and a clinically significant immunodeficiency, whether primary or secondary, since T-cell proliferation in response to activation is necessary, but not sufficient, for an effective immune response. Therefore, the proliferative response to mitogens can be regarded as a more specific but less sensitive test for the diagnosis of infection susceptibility.

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children can be underestimated. However, the practical challenges of generating a pediatric range for this assay necessitate comparison of pediatric data with adult reference values or controls.

Lymphocyte proliferation responses to mitogens and antigens are significantly affected by time elapsed since blood collection. Results have been shown to be variable for specimens assessed >24 and <48 hours postblood collection, therefore, lymphocyte proliferation results must be interpreted with due caution and results should be correlated with clinical context.

**CPT Codes:**

86353-90
Lymphocyte subsets
TBHSD, TBHSBF

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Saturday (day shift)
Methodology:
Flow cytometry
Reported:
2-3 days
Additional Information:
Absolute cell counts require a CBC w/Differential on the same sample, which will be ordered and charged separately if not otherwise available.

CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

Synonyms:
- CD3
- CD4
- CD19
- CD56
- T cells
- B cells
- NK cells
- CD4/CD8 ratio
- H/S ratio
- helper/suppressor ratio
- cytotoxic T cells
- suppressor T cells
- absolute T cell count
- T cell markers
- T subsets
- B cell markers
- T&B cells
- T & B cells
- T and B cells
- T4/T8 ratio
- flow cytometry
- TBHSD
- TBHSBF

COLLECTION

Sample Type:
EDTA whole blood

Collect:
   Lavender top

Amount to Collect:
   3 mL blood
   10 mL lavage

Preferred Volume:
   3 mL blood
   10 mL lavage

Unacceptable Conditions:
   Refrigerated sample received. Sample > 48 hours old when received.

PROCESSING

Test Code:
   TBHSD (Blood) (with CBC & diff)
   TBHSBF (Lavage only)

Test Group:
   CD

Performing Lab:
   Immunology

Specimen Preparation:
   DO NOT refrigerate, store at room temperature and ship to China Basin.

   Order CBCD if not already ordered on the same sample.

   Note: Lavage minimum volume = 1 mL

Preferred Volume:
   3 mL blood
   10 mL lavage

Unacceptable Conditions:
   Refrigerated sample received. Sample > 48 hours old when received.

RESULT INTERPRETATION

Units:
   % and x10^6 cells/L

Reference Interval:

<table>
<thead>
<tr>
<th>Subset</th>
<th>Percentage</th>
<th>Absolute</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD3 (T) Cells</td>
<td>55-88%</td>
<td>715-2431 x10^6 cells/L</td>
</tr>
<tr>
<td>CD4 (helper-inducer) T Cells</td>
<td>24-64%</td>
<td>440-1496 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8 (cytotoxic-suppressor) T Cells</td>
<td>14-40%</td>
<td>270-918 x10^6 cells/L</td>
</tr>
<tr>
<td>CD19 (B) Cells</td>
<td>6-22%</td>
<td>140-476 x10^6 cells/L</td>
</tr>
<tr>
<td>CD56 Natural Killer (NK) cells</td>
<td>3-29%</td>
<td>160-544 x10^6 cells/L</td>
</tr>
</tbody>
</table>

CD4/CD8 (H/S) Ratio: 0.7-3.9

Note: Reference values are for >= 18 year olds. For pediatric ranges please see:


Additional Information:

Absolute cell counts require a CBC w/Differential on the same sample, which will be ordered and charged separately if not otherwise available.
CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**ADMINISTRATIVE**

**CPT Codes:**
- 86360
- 86359
- 86357
- 86355
- 85025

**LOINC Codes:**
- 30364-4

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- TBHSD (Blood) (with CBC & diff)
- TBHSBF (Lavage only)

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Saturday (day shift)

**Methodology:**
- Flow cytometry

**Collect:**
- Lavender top

**Amount to Collect:**
- 3 mL blood
- 10 mL lavage

**Sample Type:**
- EDTA whole blood

**Preferred Volume:**
- 3 mL blood
- 10 mL lavage

**Unacceptable Conditions:**
- Refrigerated sample received. Sample > 48 hours old when received.

**Specimen Preparation:**
- DO NOT refrigerate, store at room temperature and ship to China Basin.

- Order CBCD if not already ordered on the same sample.

**Note:** Lavage minimum volume = 1 mL

**Units:**
- % and \( \times 10^6 \text{ cells/L} \)

**Reference Interval:**

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**Synonyms:**
- CD3
- CD4
- CD19
- CD56
- T cells
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- CD4/CD8 ratio
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- suppressor T cells
- absolute T cell count
- T cell markers
- T subsets
- B cell markers
- T&B cells
- T & B cells
- T and B cells
- T4/T8 ratio
- flow cytometry
- TBHSD
- TBHSBF

**Reported:**
2-3 days

**Additional Information:**
Absolute cell counts require a CBC w/Differential on the same sample, which will be ordered and charged separately if not otherwise available.

CD4 results are automatically forwarded to California public health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**CPT Codes:**
86360, 86359, 86357, 86355, 85025

**LOINC Codes:**
30364-4
Lymphocyte T-cell subsets, Naive and Memory
RARO

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift). Samples must arrive in lab by noon on Friday.
Methodology: Flow cytometry
Reported: 2-3 days
Additional Information: T-cell subsets (CD3/CD4/CD8) with CBC Differential or Lymphocyte subsets (T/B/NK-cell) with CBC Differential MUST be ordered together with this test in order to calculate absolute cell counts. If none is ordered on the same sample, lab will automatically order Lymphocyte subsets (T/B/NK-cell) with CBC Differential and will be charged separately.

Synonyms:
- CD45RO
- CD45RA
- CD45RA/RO
- CD45RA/CD45RO
- flow cytometry

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 3 ml blood
Preferred Volume: 3 mL blood
Minimum Volume: 1 mL blood
Remarks: Collect only Monday - Friday. Do not draw samples for this test on weekends and UCSF observed holidays. Samples drawn on Friday and the day before holidays must be received in the lab by 12 noon or they cannot be processed.
Stability (from collection to initiation): Room temperature 48 hrs
Unacceptable Conditions: Refrigerated sample. Sample > 48 hours old.

PROCESSING

Test Code: RARO
Test Group: CD
Performing Lab:

Test information subject to change
Immunology

Specimen Preparation:
DO NOT refrigerate, store at room temperature and ship to China Basin.

Order CBCD and TBHS if not already ordered on the same sample.

Samples received on weekends, holidays or after 1200 hours on Friday or the day before holiday cannot be processed or saved.

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Refrigerated sample. Sample > 48 hours old.

Stability (from collection to initiation):
Room temperature 48 hrs

RESULT INTERPRETATION

Units:
% and x10^6 cells/L

Reference Interval:

<table>
<thead>
<tr>
<th>Subset</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>CD4+ CD45 RA+</td>
<td>3-59% of CD4 T</td>
<td>48-632 x10^6 cells/L</td>
</tr>
<tr>
<td></td>
<td>cells of CD4 T-cells</td>
<td></td>
</tr>
<tr>
<td>CD4+ CD45 RO+</td>
<td>31-76% of CD4 T</td>
<td>220-833 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8+ CD45 RA+</td>
<td>15-75% of CD8 T</td>
<td>27-457 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8+ CD45 RO+</td>
<td>11-65% of CD8 T</td>
<td>48-400 x10^6 cells/L</td>
</tr>
</tbody>
</table>

For pediatric ranges please see following ranges established by Mayo Clinic - Department of Laboratory Medicine and Pathology; Rochester, MN 55905 (Laboratory Test Abstract Form - F 006284)

Pediatric:
<table>
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<tr>
<th>Subset</th>
<th>Percentage</th>
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</tr>
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<tbody>
<tr>
<td>CD4+ CD45 RA+</td>
<td>21-75% of CD4 T</td>
<td>138-893 x10^6 cells/L</td>
</tr>
<tr>
<td>CD4+ CD45 RO+</td>
<td>11-44% of CD4 T</td>
<td>56-411 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8+ CD45 RA+</td>
<td>23-88% of CD8 T</td>
<td>83-653 x10^6 cells/L</td>
</tr>
<tr>
<td>CD8+ CD45 RO+</td>
<td>2-26% of CD8 T</td>
<td>10-142 x10^6 cells/L</td>
</tr>
</tbody>
</table>

Additional Information:
T-cell subsets (CD3/CD4/CD8) with CBC Differential or Lymphocyte subsets (T/B/NK-cell) with CBC Differential MUST be ordered together with this test in order to calculate absolute cell counts. If none is ordered on the same sample, lab will automatically order Lymphocyte subsets (T/B/NK-cell) with CBC Differential and will be charged separately.

ADMINISTRATIVE

CPT Codes:
88184; 88185 x 5

LDT or Modified FDA:
Yes

LOINC Codes:
20631-8

COMPLETE VIEW

Available Stat:
No
Test Code:
RARO
Test Group:
CD
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift). Samples must arrive in lab by noon on Friday.
Methodology:
Flow cytometry
Remarks:
Collect only Monday - Friday. Do not draw samples for this test on weekends and UCSF observed holidays. Samples drawn on Friday and the day before holidays must be received in the lab by 12 noon or they cannot be processed.
Collect:
Lavender top
Amount to Collect:
3 ml blood
Sample Type:
EDTA whole blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood
Unacceptable Conditions:
Refrigerated sample. Sample > 48 hours old.
Specimen Preparation:
DO NOT refrigerate, store at room temperature and ship to China Basin.
Order CBCD and TBHS if not already ordered on the same sample.
Samples received on weekends, holidays or after 1200 hours on Friday or the day before holiday cannot be processed or saved.
Units:
% and x10^6 cells/L
Reference Interval:

<table>
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CD8+ CD45 RO+ 2-26% of CD8 T cells 10-142 x10^6 cells/L

Synonyms:
- CD45RO
- CD45RA
- CD45RA/RO

Printed 06/07/19
Test information subject to change
• CD45RA/CD45RO

• flow cytometry

**Stability (from collection to initiation):**

Room temperature 48 hrs

**Reported:**

2-3 days

**Additional Information:**

T-cell subsets (CD3/CD4/CD8) with CBC Differential or Lymphocyte subsets (T/B/NK-cell) with CBC Differential MUST be ordered together with this test in order to calculate absolute cell counts. If none is ordered on the same sample, lab will automatically order Lymphocyte subsets (T/B/NK-cell) with CBC Differential and will be charged separately.

**CPT Codes:**

88184; 88185 x 5

**LDT or Modified FDA:**

Yes

**LOINC Codes:**

20631-8
**Lymphocytic Choriomeningitis (LCM) Virus Antibodies, IgG & IgM**

**ORDERING**

**Ordering Recommendations:**
Aid in the diagnosis of lymphocytic choriomeningitis (LCM) viral infection.

**Performing Lab:**
ARUP

**Performed:**
Tue, Fri

**Methodology:**
Semi-Quantitative Indirect Fluorescent Antibody

**Reported:**
1-5 days

**Synonyms:**
- LCM Antibodies, Serum

**COLLECTION**

**Collect:**
Serum separator tube.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
Refrigerated.

**Unacceptable Conditions:**
- Contaminated, hemolyzed, or severely lipemic specimens.

**PROCESSING**

**Test Code:**
LCMVS

**ARUP Test Code:**
2001635

**Sendout:**
Yes

**Performing Lab:**
ARUP

**Specimen Preparation:**
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min 0.2 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Mark specimens plainly as “acute” or “convalescent.”

**Unacceptable Conditions:**
- Contaminated, hemolyzed, or severely lipemic specimens.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
Refrigerated.

**RESULT INTERPRETATION**

**Reference Interval:**

*Printed 06/07/19*
*Test information subject to change*
<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocytic Choriomeningitis (LCM) Virus Antibody, IgG</td>
<td>&lt;1:10 Negative - No significant level of LCM virus IgG antibody detected.</td>
</tr>
<tr>
<td></td>
<td>&gt;= 1:10 Positive - Presence of IgG antibody to LCM virus detected, suggestive of current or past infection.</td>
</tr>
<tr>
<td>Lymphocytic Choriomeningitis (LCM) Virus Antibody, IgM</td>
<td>&lt;1:10 Negative - No significant level of LCM virus IgM antibody detected.</td>
</tr>
<tr>
<td></td>
<td>&gt;= 1:10 Positive - Presence of IgM antibody to LCM virus detected, suggestive of current or past infection.</td>
</tr>
</tbody>
</table>

Interpretive Data:

The best evidence for current infection is a significant change on two appropriately timed specimens, where both tests are done in the same laboratory at the same time.

**ADMINISTRATIVE**

CPT Codes:

86727 x2

**COMPLETE VIEW**

Ordering Recommendations:

Aid in the diagnosis of lymphocytic choriomeningitis (LCM) viral infection.

Test Code:

LCMVS

ARUP Test Code:

2001635

Performing Lab:

ARUP

Sendout:

Yes

Performed:

Tue, Fri

Methodology:

Semi-Quantitative Indirect Fluorescent Antibody

Collect:

Serum separator tube.

Unacceptable Conditions:

Contaminated, hemolyzed, or severely lipemic specimens.

Specimen Preparation:

Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min 0.2 mL) Parallel testing is preferred and convalescent specimens must be received within 30 days from receipt of the acute specimens. Mark specimens plainly as "acute" or "convalescent."

Reference Interval:

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<td></td>
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<td>Lymphocytic Choriomeningitis (LCM) Virus Antibody, IgM</td>
<td>&lt;1:10 Negative - No significant level of LCM virus IgM antibody detected.</td>
</tr>
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<td>&gt;= 1:10 Positive - Presence of IgM antibody to LCM virus detected, suggestive of current or past infection.</td>
</tr>
</tbody>
</table>

Interpretive Data:

The best evidence for current infection is a significant change on two appropriately timed specimens, where both tests are done in the same laboratory at the same time.

Synonyms:

- LCM Antibodies, Serum

Storage/Transport Temperature:

Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
1-5 days

CPT Codes:
86727 x2
Lymphocytic Choriomeningitis (LCM) Virus Antibodies, IgG & IgM, CSF
LCMVC

ORDERING

Ordering Recommendations:
Aid in the diagnosis of lymphocytic choriomeningitis (LCM) viral infection in CNS.
Performing Lab:
ARUP
Performed:
Tue, Fri
Methodology:
Semi-Quantitative Indirect Fluorescent Antibody
Reported:
1-5 days
Synonyms:
• LCM Antibodies, CSF

COLLECTION

Collect:
CSF.
Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Refrigerated.
Unacceptable Conditions:
Contaminated, hemolyzed, or heat-inactivated specimens.

PROCESSING

Test Code:
LCMVC
ARUP Test Code:
2001628
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transfer 1 mL CSF to an ARUP Standard Transport Tube. (Min 0.2 mL)
Unacceptable Conditions:
Contaminated, hemolyzed, or heat-inactivated specimens.
Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocytic Choriomeningitis (LCM)</td>
<td>&lt;1:1 Negative - No significant level of LCM virus IgG antibody detected.</td>
</tr>
</tbody>
</table>
Interpretive Data:
The best evidence for current infection is a significant change on two appropriately timed specimens, where both tests are done in the same laboratory at the same time.

Administrative

CPT Codes:
86727 x2

Complete View

Ordering Recommendations:
Aid in the diagnosis of lymphocytic choriomeningitis (LCM) viral infection in CNS.

Test Code:
LCMVC

ARUP Test Code:
2001628

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Tue, Fri

Methodology:
Semi-Quantitative Indirect Fluorescent Antibody

Collect:
CSF.

Unacceptable Conditions:
Contaminated, hemolyzed, or heat-inactivated specimens.

Specimen Preparation:
Transfer 1 mL CSF to an ARUP Standard Transport Tube. (Min 0.2 mL)

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphocytic Choriomeningitis (LCM) Virus Antibody, IgG, CSF</td>
<td>&lt;1:1 Negative - No significant level of LCM virus IgG antibody detected.</td>
</tr>
<tr>
<td>Lymphocytic Choriomeningitis (LCM) Virus Antibody, IgM, CSF</td>
<td>&gt;= 1:1 Positive - Presence of IgM antibody to LCM virus detected, suggestive of current or past infection</td>
</tr>
</tbody>
</table>

Interpretive Data:
The best evidence for current infection is a significant change on two appropriately timed specimens, where both tests are done in the same laboratory at the same time.

Synonyms:
- LCM Antibodies, CSF

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
1-5 days
CPT Codes:
86727 x2
Lymphogranuloma venereum Antibody Panel
LGV

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Micro-indirect fluorescence
Reported: 5-7 days

Additional Information:
Lymphogranuloma venereum (LGV) is a clinical syndrome caused by infection with serovars L1, L2, or L3 of C. trachomatis. Due to the highly crossreactive nature of the C. trachomatis (L2) antigen used in this panel, antibodies induced by infection with C. trachomatis (D-K) or other chlamydial species often show strong L2 reactivity. Thus, detection of L2-reactive antibodies does not necessarily indicate infection with LGV serovars of C. trachomatis. Results for the whole Chlamydia antibody panel should be considered in conjunction with clinical findings to establish the diagnosis.

Includes:
- C. pneumoniae IgA, C. psittaci IgA, C. trachomatis (L2) IgA, C. trachomatis (D-K) IgA
- C. pneumoniae IgG, C. psittaci IgG, C. trachomatis (L2) IgG, C. psittaci IgG
- C. pneumoniae IgM, C. psittaci IgM, C. trachomatis (L2) IgM

Synonyms:
- LGV

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

PROCESSING

Test Code: LGV
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Spin and freeze aliquot at -20°C. Ship to CB.
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum

Printed 06/07/19
Test information subject to change
**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

**RESULT INTERPRETATION**

**Units:**
Titer

**Reference Interval:**
- IgG: <1:64
- IgA: <1:16
- IgM: <1:10

**Additional Information:**
Lymphogranuloma venereum (LGV) is a clinical syndrome caused by infection with serovars L1, L2, or L3 of C. trachomatis. Due to the highly crossreactive nature of the C. trachomatis (L2) antigen used in this panel, antibodies induced by infection with C. trachomatis (D-K) or other chlamydial species often show strong L2 reactivity. Thus, detection of L2-reactive antibodies does not necessarily indicate infection with LGV serovars of C. trachomatis. Results for the whole Chlamydia antibody panel should be considered in conjunction with clinical findings to establish the diagnosis.

Includes:
- C. pneumoniae IgA, C. psittaci IgA, C. trachomatis (L2) IgA, C. trachomatis (D-K) IgA, C. pneumoniae IgG, C. trachomatis (L2) IgG, C. psittaci IgG, C. trachomatis (D-K) IgG, C. trachomatis (D-K) IgM, C. pneumoniae IgM, C. psittaci IgM, C. trachomatis (L2) IgM

**ADMINISTRATIVE**

**CPT Codes:**
86632-90 x4, 86631-90 x8

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
LGV

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Micro-indirect fluorescence

**Collect:**
Red top or Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Specimen Preparation:**
Spin and freeze aliquot at -20C. Ship to CB.

**Units:**
Titer

**Reference Interval:**
- IgG: <1:64
- IgA: <1:16
IgM: <1:10

**Synonyms:**
- LGV

**Stability (from collection to initiation):**
- Room temperature 1 week, refrigerated 2 weeks, frozen 1 month

**Reported:**
- 5-7 days

**Additional Information:**
Lymphogranuloma venereum (LGV) is a clinical syndrome caused by infection with serovars L1, L2, or L3 of *C. trachomatis*. Due to the highly crossreactive nature of the *C. trachomatis* (L2) antigen used in this panel, antibodies induced by infection with *C. trachomatis* (D-K) or other chlamydial species often show strong L2 reactivity. Thus, detection of L2-reactive antibodies does not necessarily indicate infection with LGV serovars of *C. trachomatis*. Results for the whole Chlamydia antibody panel should be considered in conjunction with clinical findings to establish the diagnosis.

**Includes:**

**CPT Codes:**
- 86632-90 x4, 86631-90 x8
Lysosomal Acid Lipase Activity, Dried Blood Spot
LALA

ORDERING

Performing Lab:
ARUP
Performing Lab:
Varies
Methodology:
Quantitative Fluorometry
Reported:
3-10 days
Synonyms:
- CESD
- Cholesterol Ester Storage Disease
- LAL deficiency
- LIPA deficiency
- Lysosomal acid lipase deficiency
- Wolman Disease

COLLECTION

Collect:
Whole blood: Yellow (ACD Solution A). Also Acceptable: Lavender (K₂EDTA), Lavender (K₃EDTA) or Green (Sodium heparin).
Remarks:
Additional information is required: Clinical Indication for testing.
Stability (from collection to initiation):
DBS: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month
Whole Blood: Ambient: 3 days; Refrigerated: 3days; Frozen: Unacceptable
Storage/Transport Temperature:
DBS: Room temperature. Also acceptable: Refrigerated.
Whole Blood: Refrigerated. Also acceptable: Room temperature.
Unacceptable Conditions:
DBS: Samples transported before blood is dried. Blood not soaked through to the back of the filter paper card. Heavily saturated, clotted, or double-spotted samples. Samples with evidence of milking or squeezing the puncture site or of contamination by alcohol or other liquids.

PROCESSING

Test Code:
LALA
ARUP Test Code:
2012266
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
DBS: Whole blood collected on filter paper by direct puncture and dried.
Whole blood collected by venipuncture in Yellow (ACD Solution A) or Lavender (K₂EDTA), Lavender (K₃EDTA) or Green (Sodium heparin) and then spotted on filter paper and dried.
Allow blood to completely air dry before transporting for a minimum of 4 hours to overnight. Two circles of whole blood. (Min: 1 circle)
Whole Blood: Transport 1 mL whole blood. (Min: 0.5 mL)

Unacceptable Conditions:
DBS: Samples transported before blood is dried. Blood not soaked through to the back of the filter paper card. Heavily saturated, clotted, or double-spotted samples. Samples with evidence of milking or squeezing the puncture site or of contamination by alcohol or other liquids.

Stability (from collection to initiation):
DBS: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month
Whole Blood: Ambient: 3 days; Refrigerated: 3 days; Frozen: Unacceptable

Storage/Transport Temperature:
DBS: Room temperature. Also acceptable: Refrigerated.
Whole Blood: Refrigerated. Also acceptable: Room temperature.

RESULT INTERPRETATION

Reference Interval:
0.50 - 2.30 nmol hydrolyzed/hr/DBS punch

Interpretive Data:
Refer to report.
Lysosomal acid lipase activity is reported in nanomoles hydrolyzed per hr per DBS punch.

ADMINISTRATIVE

CPT Codes:
82657

COMPLETE VIEW

Test Code:
LALA
ARUP Test Code:
2012266
Performing Lab:
ARUP
Sendout:
Yes
Performed:
Varies
Methodology:
Quantitative Fluorometry
Remarks:
Additional information is required: Clinical Indication for testing.
Collect:
Whole blood: Yellow (ACD Solution A). Also Acceptable: Lavender (K₂EDTA), Lavender (K₃EDTA) or Green (Sodium heparin).

Unacceptable Conditions:
DBS: Samples transported before blood is dried. Blood not soaked through to the back of the filter paper card. Heavily saturated, clotted, or double-spotted samples. Samples with evidence of milking or squeezing the puncture site or of contamination by alcohol or other liquids.

Specimen Preparation:
DBS: Whole blood collected on filter paper by direct puncture and dried.
Whole blood collected by venipuncture in Yellow (ACD Solution A) or Lavender (K₂EDTA), Lavender (K₃EDTA) or Green (Sodium heparin) and then spotted on filter paper and dried.
Allow blood to completely air dry before transporting for a minimum of 4 hours to overnight. Two circles of whole blood. (Min: 1 circle)
Whole Blood: Transport 1 mL whole blood. (Min: 0.5 mL)
Reference Interval:
0.50 - 2.30 nmol hydrolyzed/hr/DBS punch

Interpretive Data:
Refer to report.
Lysosomal acid lipase activity is reported in nanomoles hydrolyzed per hr per DBS punch.

Synonyms:
- CESD
- Cholesterol Ester Storage Disease
- LAL deficiency
- LIPA deficiency
- Lysosomal acid lipase deficiency
- Wolman Disease

Storage/Transport Temperature:
DBS: Room temperature. Also acceptable: Refrigerated.
Whole Blood: Refrigerated. Also acceptable: Room temperature.

Stability (from collection to initiation):
DBS: Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 month
Whole Blood: Ambient: 3 days; Refrigerated: 3 days; Frozen: Unacceptable

Reported:
3-10 days

CPT Codes:
82657
Lysosomal Disease Screen

ORDERING

Available Stat:
No
Performing Lab:
Jefferson Medical College
Reported:
Test performed Thursday. Turnaround time: 10 days.
Additional Information:
A detailed clinical history must accompany the test request or be sent by fax: (215)955-7560. Click here to obtain the history form.

Additional assays for confirmatory testing may be run and charged separately.

In addition to this diagnostic screen, carrier identification and prenatal testing for many disorders is also available.

Synonyms:
- Alpha-iduronidase
- Multiple sulfatase deficiency
- Sulfatase deficiency,multiple
- Mucolipidosis Screen

COLLECTION

Sample Type:
Heparinized whole blood
Collect:
Dark Green top
Amount to Collect:
10 mL blood
Preferred Volume:
10 mL blood
Minimum Volume:
3 mL blood
Remarks:
Keep sample at room temperature.

A detailed clinical history must accompany the test request or be sent by fax: (215)955-7560. Click here to obtain the history form.

Sample must arrive at Jefferson Medical College within 24 hours of collection, therefore collect Monday-Thursday noon only.

Unacceptable Conditions:
Samples collected outside of stated time frames

PROCESSING

Test Code:
LYDX
Sendout:
Yes
Performing Lab:
Jefferson Medical College
Specimen Preparation:
Keep at room temperature-do NOT centrifuge or refrigerate.
Ship with clinical history by Federal Express, Monday-Thursday only, to: Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 346, 1020 Locust St., Philadelphia, PA 19107 ph: (215) 955-4923, fax (215) 955-9554, e-mail: david.wenger@mail.tju.edu

Preferred Volume:
  10 mL blood
Minimum Volume:
  3 mL blood
Unacceptable Conditions:
  Samples collected outside of stated time frames

RESULT INTERPRETATION

Additional Information:
A detailed clinical history must accompany the test request or be sent by fax: (215)955-7560. Click here to obtain the history form.

Additional assays for confirmatory testing may be run and charged separately.

In addition to this diagnostic screen, carrier identification and prenatal testing for many disorders is also available.

ADMINISTRATIVE

CPT Codes:
  82657-90
LOINC Codes:
  48311-5

COMPLETE VIEW

Available Stat:
  No
Test Code:
  LYDX
Performing Lab:
  Jefferson Medical College
Sendout:
  Yes
Remarks:
  Keep sample at room temperature.
  A detailed clinical history must accompany the test request or be sent by fax: (215)955-7560. Click here to obtain the history form.
  Sample must arrive at Jefferson Medical College within 24 hours of collection, therefore collect Monday-Thursday noon only.
Collect:
  Dark Green top
Amount to Collect:
  10 mL blood
Sample Type:
  Heparinized whole blood
Preferred Volume:
  10 mL blood
Minimum Volume:
  3 mL blood
Unacceptable Conditions:
  Samples collected outside of stated time frames
Specimen Preparation:
Keep at room temperature-do NOT centrifuge or refrigerate.

Ship with clinical history by Federal Express, Monday-Thursday only, to: Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 346, 1020 Locust St., Philadelphia, PA 19107 ph: (215) 955-4923, fax (215) 955-9554, e-mail: david.wenger@mail.tju.edu

david.wenger@mail.tju.edu

Synonyms:
- Alpha-iduronidase
- Multiple sulfatase deficiency
- Sulfatase deficiency, multiple
- Mucolipidosis Screen

Reported:
Test performed Thursday. Turnaround time: 10 days.

Additional Information:
- A detailed clinical history must accompany the test request or be sent by fax: (215)955-7560. Click here to obtain the history form.
- Additional assays for confirmatory testing may be run and charged separately.
- In addition to this diagnostic screen, carrier identification and prenatal testing for many disorders is also available.

CPT Codes:
- 82657-90

LOINC Codes:
- 48311-5
### Lysozyme, serum

**FREE**

#### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Turbidimetric

**Reported:**
Test performed Monday-Wednesday-Friday. Turnaround time: 2-3 days.

#### COLLECTION

**Sample Type:**
Serum

**Collect:**
Gold top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 15 days, frozen at -20C 18 days.

#### PROCESSING

**Test Code:**
LYSO

**Test Group:**
Lysozyme

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Freeze at -20C. Order Quest # 25890P.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 15 days, frozen at -20C 18 days.

#### RESULT INTERPRETATION

**Units:**
µg/mL (mcg/mL)

**Reference Interval:**

---

Printed 06/07/19  
Test information subject to change
5.0 - 11.0 µg/mL

ADMINISTRATIVE

CPT Codes:
85549-90

LOINC Codes:
2589-0

COMPLETE VIEW

Available Stat:
No

Test Code:
LYSO

Test Group:
Lysozyme

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Turbidimetric

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze at -20C. Order Quest # 25890P.

Units:
µg/mL (mcg/mL)

Reference Interval:
5.0 - 11.0 µg/mL

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 15 days, frozen at -20C 18 days.

Reported:
Test performed Monday-Wednesday-Friday. Turnaround time: 2-3 days.

CPT Codes:
85549-90

LOINC Codes:
2589-0

Printed 06/07/19
Test information subject to change
Lysozyme, urine
MOLT

ORDERING

Available Stat:
   No
Performing Lab:
   Quest
Methodology:
   Immunodiffusion
Reported:
   Test performed Monday-Wednesday-Friday. Turnaround time: 2-5 days.

COLLECTION

Sample Type:
   Random urine
Collect:
   Urine cup
Amount to Collect:
   See preferred volume
Preferred Volume:
   1 mL urine
Minimum Volume:
   0.2 mL urine

PROCESSING

Test Code:
   MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Test Group:
   Lysozyme
Sendout:
   Yes
Performing Lab:
   Quest
Specimen Preparation:
   Freeze at -20C. Order Quest # 109710P
Preferred Volume:
   1 mL urine
Minimum Volume:
   0.2 mL urine

RESULT INTERPRETATION

Units:
   mg/L
Reference Interval:
   <4.0 mg/L

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
85549-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Lysozyme

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunodiffusion

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.2 mL urine

Specimen Preparation:
Freeze at -20C. Order Quest # 109710P

Units:
mg/L

Reference Interval:
<4.0 mg/L

Reported:
Test performed Monday-Wednesday-Friday. Turnaround time: 2-5 days.

CPT Codes:
85549-90
Macroprolactin
MACPRO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immonoassay & PEG precipitation
Reported:
7-10 days
Additional Information:
For some patients the level of Prolactin measured by immunoassay may be inaccurate with respect to the level of monomeric, biologically active Prolactin. The Macroprolactin by PEG Precipitation test can help to identify if a patient sample has elevated Prolactin due to mostly inactive protein-bound Prolactin (Macroprolactin).
Synonyms:
• prolactin monomeric
• monomeric prolactin

COLLECTION

Patient Preparation:
Fasting recommended but not required
Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.4 mL serum
Stability (from collection to initiation):
Room temperature or refrigerated 1 week, frozen 6 months
Unacceptable Conditions:
Plasma samples, hemolyzed samples
Rejection Criteria:
Plasma samples, hemolyzed samples

PROCESSING

Test Code:
MACPRO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze serum. Transport to CB frozen. Order Quest code 16122
Preferred Volume:
1 mL serum
Minimum Volume:

0.4 mL serum

Unacceptable Conditions:

Plasma samples, hemolyzed samples

Rejection Criteria:

Plasma samples, hemolyzed samples

Stability (from collection to initiation):

Room temperature or refrigerated 1 week, frozen 6 months

RESULT INTERPRETATION

Units:

ng/mL

Additional Information:

For some patients the level of Prolactin measured by immunoassay may be inaccurate with respect to the level of monomeric, biologically active Prolactin. The Macroprolactin by PEG Precipitation test can help to identify if a patient sample has elevated Prolactin due to mostly inactive protein-bound Prolactin (Macroprolactin).

ADMINISTRATIVE

CPT Codes:

84146-90 x2

COMPLETE VIEW

Available Stat:

No

Test Code:

MACPRO

Performing Lab:

Quest

Sendout:

Yes

Methodology:

Imunoassay & PEG precipitation

Patient Preparation:

Fasting recommended but not required

Collect:

Gold top or Red top

Amount to Collect:

2 mL blood

Sample Type:

Serum

Preferred Volume:

1 mL serum

Minimum Volume:

0.4 mL serum

Rejection Criteria:

Plasma samples, hemolyzed samples

Unacceptable Conditions:

Plasma samples, hemolyzed samples

Specimen Preparation:

Aliquot and freeze serum. Transport to CB frozen. Order Quest code 16122

Units:

ng/mL
Synonyms:
- prolactin monomeric
- monomeric prolactin

Stability (from collection to initiation):
- Room temperature or refrigerated 1 week, frozen 6 months

Reported:
- 7-10 days

Additional Information:
- For some patients the level of Prolactin measured by immunoassay may be inaccurate with respect to the level of monomeric, biologically active Prolactin. The Macroprolactin by PEG Precipitation test can help to identify if a patient sample has elevated Prolactin due to mostly inactive protein-bound Prolactin (Macroprolactin).

CPT Codes:
- 84146-90 x2

Test information subject to change
Magnesium, 24 hour urine

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.
Methodology:
Spectrophotometric (calmagite dye)
Reported:
Test run 2x daily. Results available at 1400 & 2000
Additional Information:
Output varies with the diet.

To convert mg/d to mmol/d (SI units) multiply by x 0.411.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.

Reference:

Synonyms:
- Mg

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output.
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Remarks:
Keep container refrigerated during collection. Indicate hours of collection on requisition.
Stability (from collection to initiation):
Refrigerated 2 days
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
MGU
**Test Group:**
- Magnesium

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Specimen Preparation:**
Sample can be collected in a preservative free container. Following collection in a preservative free container, aliquot 2 mL and add 1 drop of 6N HCl to acidify.

**Preferred Volume:**
- 2 mL urine

**Minimum Volume:**
- 1 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection.

**Stability (from collection to initiation):**
- Refrigerated 2 days

**RESULT INTERPRETATION**

**Units:**
- mg/D

**Reference Interval:**
- 73-122 mg/D See Additional information.

**Additional Information:**
Output varies with the diet.

To convert mg/d to mmol/d (SI units) multiply by x 0.411.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See "Calcium" and "Iron" entries for respective interferences.

Reference:

**ADMINISTRATIVE**

**CPT Codes:**
- 83735

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- MGU

**Test Group:**
- Magnesium

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 7 days per week from 8:00 AM to midnight only.

**Methodology:**
- Spectrophotometric (calmagite dye)
Remarks:
Keep container refrigerated during collection. Indicate hours of collection on requisition.

Collect:
- 24 hour urine collection container

Amount to Collect:
- Entire 24 hour urine output.

Sample Type:
- 24 hour urine collection

Preferred Volume:
- 2 mL urine

Minimum Volume:
- 1 mL urine

Unacceptable Conditions:
- Container not refrigerated during collection.

Specimen Preparation:
Sample can be collected in a preservative free container. Following collection in a preservative free container, aliquot 2 mL and add 1 drop of 6N HCl to acidify.

Units:
- mg/D

Reference Interval:
- 73-122 mg/D
See Additional information.

Synonyms:
- Mg

Stability (from collection to initiation):
- Refrigerated 2 days

Reported:
- Test run 2x daily. Results available at 1400 & 2000

Additional Information:
Output varies with the diet.

To convert mg/d to mmol/d (SI units) multiply by x 0.411.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.

Reference:

CPT Codes:
- 83735
Magnesium, Plasma / Serum
MG

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (calmagite dye)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by x 0.411.
Severely lipemic samples will be treated and reassayed. Hemolysis may artifactually increase the result.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.


Synonyms:
• Mg

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
MG
Test Group:
Magnesium
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:  
0.5 mL plasma or serum

Minimum Volume:  
0.2 mL plasma or serum

Stability (from collection to initiation):  
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:  
mg/dL

Reference Interval:  
1.8 - 2.4 mg/dL

Normal range was determined by testing 271 male and female adult healthy blood donors at UCSF. Pediatric patients will use adult range due to comparable ranges between UCSF’s normal study and Soldin, Steven J. Pediatric Reference Intervals, 6th edition, AACC Press, 2007.

Critical Values:  
Most Units: < 1.0 mg/dL or > 4.5 mg/dL  
Birth Center: < 1.0 mg/dL or > 8.0 mg/dL

Additional Information:  
To convert mg/dL to mmol/L (SI units) multiply by x 0.411.

Severely lipemic samples will be treated and reassayed. Hemolysis may artifactualy increase the result.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.


ADMINISTRATIVE

CPT Codes:  
83735

LOINC Codes:  
19123-9

COMPLETE VIEW

Available Stat:  
Yes

Test Code:  
MG

Test Group:  
Magnesium

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:  
Test available 24 hours per day 7 days per week

Methodology:  
Spectrophotometric (calmagite dye)
Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mg/dL

Reference Interval:
1.8 - 2.4 mg/dL

Normal range was determined by testing 271 male and female adult healthy blood donors at UCSF. Pediatric patients will use adult range due to comparable ranges between UCSF's normal study and Soldin, Steven J. Pediatric Reference Intervals, 6th edition, AACC Press, 2007.

Critical Values:
Most Units: < 1.0 mg/dL or > 4.5 mg/dL
Birth Center: < 1.0 mg/dL or > 8.0 mg/dL

Synonyms:
Mg

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by x 0.411.

Severely lipemic samples will be treated and reassayed. Hemolysis may artifactually increase the result.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See "Calcium" and "Iron" entries for respective interferences.


CPT Codes:
83735

LOINC Codes:
19123-9
Magnesium, random urine

MGUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (calmagite dye)
Reported:
Routine 4 hours
Additional Information:
Output varies with the diet.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.


Synonyms:
• Mg

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL urine
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Remarks:
Refrigerate sample after collection if transport to laboratory is delayed
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
MGUR
Test Group:
Magnesium
Performing Lab:
Specimen Preparation:
Aliquot 2 mL urine and add 1 drop of 6N HCl to acidify.

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
See additional information

Additional Information:
Output varies with the diet.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See “Calcium” and “Iron” entries for respective interferences.


ADMINISTRATIVE

CPT Codes:
82570-90, 83735-90

LOINC Codes:
19124-7

COMPLETE VIEW

Available Stat:
No

Test Code:
MGUR

Test Group:
Magnesium

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (calmagite dye)

Remarks:
Refrigerate sample after collection if transport to laboratory is delayed

Collect:
Urine cup

Amount to Collect:
10 mL urine

Sample Type:
Random urine

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Specimen Preparation:
Aliquot 2 mL urine and add 1 drop of 6N HCl to acidify.

Units:
mg/dL

Reference Interval:
See additional information

Synonyms:
• Mg

Stability (from collection to initiation):
Refrigerated 2 days

Reported:
Routine 4 hours

Additional Information:
Output varies with the diet.

Gadolinium MR contrast agents including Gadodiamide (Omniscan), Gadoversetamide (Optimark), Gadopentetate Dimeglumine (Magnevist), and Gadoterdiol (Prohance), have been shown to interfere with certain colorimetric assays used in the measurement of various serum cations including iron, magnesium, and calcium. The UCSF clinical labs utilize a colorimetric assay for the measurement of both serum iron and serum magnesium that are subject to this interference. For serum magnesium, some gadolinium containing agents (Gadodiamide and Gadoversetamide) may produce a falsely elevated result (on average 117 and 124% respectively, of the true serum magnesium concentration). See "Calcium" and "Iron" entries for respective interferences.


CPT Codes:
82570-90, 83735-90

LOINC Codes:
19124-7
Malaria Antibodies
MOLT

ORDERING

Available Stat: No
Performing Lab: Parasitic Disease Consultants via Quest.
Methodology: Immunofluorescence assay
Reported: 7-14 days
Additional Information: Serology is useful in identifying infected blood donors or other patients who are strongly suspected of carrying malarial parasites but whose blood smears are repeatedly negative. Elevated titers persist for years after treatment without subsequent reexposure and can only indicate infection at some time in the past. Titers should not be the sole basis for initiating treatment.

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top acceptable)
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Room temperature 1 year.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: malaria
Sendout: Yes
Performing Lab: Parasitic Disease Consultants via Quest.
Specimen Preparation: Store and transport at room temperature. Order Quest # 10670X
Preferred Volume: 2 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Room temperature 1 year.

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Reference Interval:
Negative

Additional Information:
Serology is useful in identifying infected blood donors or other patients who are strongly suspected of carrying malarial parasites but whose blood smears are repeatedly negative. Elevated titers persist for years after treatment without subsequent reexposure and can only indicate infection at some time in the past. Titers should not be the sole basis for initiating treatment.

CPT Codes:
86750-90 x4

Complete View

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
malaria

Performing Lab:
Parasitic Disease Consultants via Quest.

Sendout:
Yes

Methodology:
Immunofluorescence assay

Collect:
Red top (Gold top acceptable)

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Store and transport at room temperature. Order Quest # 10670X

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature 1 year.

Reported:
7-14 days

Additional Information:
Serology is useful in identifying infected blood donors or other patients who are strongly suspected of carrying malarial parasites but whose blood smears are repeatedly negative. Elevated titers persist for years after treatment without subsequent reexposure and can only indicate infection at some time in the past. Titers should not be the sole basis for initiating treatment.

CPT Codes:
86750-90 x4
Malaria Smear
P403M

ORDERING

Available Stat:
Yes, thin smear only

Performing Lab:
Microbiology, Parnassus & Mission Bay Hematology

Performed:
Stat: Daily, all shifts
Routine: Daily until 9:00 PM

Methodology:
Thick and thin Giemsa- or Wright's stained smears

Reported:
A preliminary report, based on the reading of one thin smear, is available within 2 hours for stats and 4-12 hours for routine samples. Thick smears are read Monday-Friday 0800-1500 hours only. Final report is sent after thick smears are read.

Additional Information:
Will detect Babesia species. Other blood parasites may also be detected.

Delay in preparation of blood smears can decrease the sensitivity of the test.

Stats are read and a preliminary result is reported by Hematology. Stat examination of thick smears is NOT available.

For possible Babesiosis, see also entry under Babesia microti Antibodies.

Synonyms:
- babesia
- plasmodium sp
- P. vivax
- P. falciparum
- P. malariae
- P. ovale

COLLECTION

Sample Type:
EDTA whole blood (Heparinized acceptable)

Collect:
Lavender top (Dark green top acceptable)

Amount to Collect:
3 mL blood

Remarks:
Deliver to lab within 1 hour of collection. If possible, samples from Moffitt-Long inpatients and ED should be walked directly to the STAT window in Clinical Lab Specimen Processing (5th floor Moffitt) by an attendant.

Order stat only if results required for immediate care decisions (e.g. patient extremely ill, potentially requiring admission or suspected of having cerebral malaria).

Note exact time of blood draw on sample and provide history of travel, residence, prophylaxis and/or therapy received before the specimen was obtained. Indicate if other parasites (e.g. Babesia) are suspected.

The optimal time to collect a specimen is midway between chills (before a fever spike is anticipated). If the first specimen is negative for malarial parasites, submit specimens q12-24h for 72 hours.
Test Code: P403M
Test Group: malaria
Performing Lab: Microbiology, Parnassus & Mission Bay Hematology

Specimen Preparation:
Microbiology (0700-2330) or Hematology (2330-0700) lab staff will make 4 thin and 4 thick smears to send to China Basin. Smears should be made within 1 hour of specimen collection. Enter code COMPRO in SREQ if >1 hour. Thin smears should be fixed with methanol (write "fixed" on slide). Do not fix thick smears. If test is ordered STAT, 2 additional thin smears should be made and delivered to Hematology to stain and read.

If thick smears are not dry when courier arrives, send thin smears to China Basin with note "Thick smears to follow."

Mt. Zion specimens should be sent to China Basin as soon as possible. Microbiology staff at China Basin will make smears.

Specimens should be refrigerated upon receipt at China Basin, once smears have been made.

RESULT INTERPRETATION

Reference Interval:
Negative

Critical Values:
Positive smear

Additional Information:
Will detect Babesia species. Other blood parasites may also be detected.

Delay in preparation of blood smears can decrease the sensitivity of the test.

Stats are read and a preliminary result is reported by Hematology. Stat examination of thick smears is NOT available.

For possible Babesiosis, see also entry under Babesia microti Antibodies.

ADMINISTRATIVE

CPT Codes:
87207

LOINC Codes:
32700-7

COMPLETE VIEW

Available Stat:
Yes, thin smear only

Test Code: P403M
Test Group: malaria
Performing Lab: Microbiology, Parnassus & Mission Bay Hematology

Performed:
Stat: Daily, all shifts
Routine: Daily until 9:00 PM

Methodology:
Thick and thin Giemsa- or Wright's stained smears

Remarks:
Deliver to lab within 1 hour of collection. If possible, samples from Moffitt-Long inpatients and ED should be walked directly to the STAT window in Clinical Lab Specimen Processing (5th floor Moffitt) by an attendant.

Order stat only if results required for immediate care decisions (e.g. patient extremely ill, potentially requiring admission or suspected of having cerebral malaria).

Note exact time of blood draw on sample and provide history of travel, residence, prophylaxis and/or therapy received before the specimen was obtained. Indicate if other parasites (e.g. Babesia) are suspected.

The optimal time to collect a specimen is midway between chills (before a fever spike is anticipated). If the first specimen is negative for malarial parasites, submit specimens q12-24h for 72 hours.

Collect:
- Lavender top (Dark green top acceptable)

**Amount to Collect:**
- 3 mL blood

**Sample Type:**
- EDTA whole blood (Heparinized acceptable)

**Specimen Preparation:**
- Microbiology (0700-2330) or Hematology (2330-0700) lab staff will make 4 thin and 4 thick smears to send to China Basin. Smears should be made within 1 hour of specimen collection. Enter code COMPRO in SREQ if >1 hour. Thin smears should be fixed with methanol (write "fixed" on slide). Do not fix thick smears. If test is ordered STAT, 2 additional thin smears should be made and delivered to Hematology to stain and read.

If thick smears are not dry when courier arrives, send thin smears to China Basin with note "Thick smears to follow."

Mt. Zion specimens should be sent to China Basin as soon as possible. Microbiology staff at China Basin will make smears. Specimens should be refrigerated upon receipt at China Basin, once smears have been made.

**Reference Interval:**
- Negative

**Critical Values:**
- Positive smear

**Synonyms:**
- babesia
- plasmodium sp
- P. vivax
- P. falciparum
- P. malariae
- P. ovale

**Reported:**
- A preliminary report, based on the reading of one thin smear, is available within 2 hours for stats and 4-12 hours for routine samples. Thick smears are read Monday-Friday 0800-1500 hours only. Final report is sent after thick smears are read.

**Additional Information:**
- Will detect Babesia species. Other blood parasites may also be detected.

- Delay in preparation of blood smears can decrease the sensitivity of the test.

- Stats are read and a preliminary result is reported by Hematology. Stat examination of thick smears is NOT available.

_for possible Babesiosis, see also entry under Babesia microti Antibodies._

**CPT Codes:**
- 87207

**LOINC Codes:**
- 32700-7
MALT1 18q21 FISH
BMALT1, MALT1

ORDERING

Available Stat:
No
Performing Lab:
Molecular Genetics - Cytogenetics
Performed:
Monday - Friday 0900-1700
Methodology:
FISH
Reported:
1-2 weeks
Synonyms:
- 18q21break apart FISH, MALT1 FISH

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow, Bone marrow core biopsy
Collect:
Dark green top
Amount to Collect:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow: 1 mL
- Bone marrow biopsy: 1 cm
Remarks:
Mix sample well with anticoagulant. keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
BMALT1: Blood
MALT1: Bone marrow
Performing Lab:
Molecular Genetics - Cytogenetics
Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples.
Preferred Volume:
Blood: 2 mL  
Bone marrow: 2 mL  
?Bone marrow biopsy: 2 cm  

Minimum Volume:  
Blood: 1 mL  
Bone marrow: 1 mL  
?Bone marrow biopsy: 1 cm  

Unacceptable Conditions:  
Clotted samples. Samples received refrigerated or frozen.  

Stability (from collection to initiation):  
Room temperature 2 days

---

**ADMINISTRATIVE**

CPT Codes:  
88271 x2, 88275  
LDT or Modified FDA:  
Yes

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**COMPLETE VIEW**

Available Stat:  
No  
Test Code:  
  BMALT1: Blood  
  MALT1: Bone marrow  
Performing Lab:  
  Molecular Genetics - Cytogenetics  
Performed:  
  Monday - Friday 0900-1700  
Methodology:  
  FISH  
Remarks:  
  Mix sample well with anticoagulant. keep at room temperature  
Collect:  
  Dark green top  
Amount to Collect:  
  Blood: 2 mL  
  Bone marrow: 2 mL  
  Bone marrow biopsy: 2 cm  
Sample Type:  
  Heparinized whole blood or bone marrow, Bone marrow core biopsy  
Preferred Volume:  
  Blood: 2 mL  
  Bone marrow: 2 mL  
  ?Bone marrow biopsy: 2 cm  
Minimum Volume:  
  Blood: 1 mL  
  Bone marrow: 1 mL  
  ?Bone marrow biopsy: 1 cm  
Unacceptable Conditions:  
Clotted samples. Samples received refrigerated or frozen.  
Specimen Preparation:  
  Do not centrifuge, refrigerate or freeze samples.  
  Transport to China Basin Cytogenetics asap.  
Synonyms:
• 18q21break apart FISH, MALT1 FISH

Stability (from collection to initiation):
  Room temperature 2 days

Reported:
  1-2 weeks

CPT Codes:
  88271 x2, 88275

LDT or Modified FDA:
  Yes
**Manganese, blood**

**ORDERING**

**Ordering Recommendations:**
- Manganese performed on whole blood is the preferred method to monitor for toxicity.

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Performed:**
- Test performed Monday-Friday.

**Methodology:**
- ICP/MS

**Reported:**
- 2-5 days.

**Additional Information:**
- Manganese is an essential trace metal. Over 95% of manganese in blood is protein bound and therefore whole blood levels are higher than those derived from serum.

- Toxicity that can result from excessive exposure can cause serious organ damage. Symptoms include Parkinsonian-like tremor and gait disturbances. Manganese is excreted in bile therefore patients with hepatic dysfunction/cholestasis and receiving manganese in TPN may be at increased risk for toxicity.

- To convert µg/L to nmol/L (SI units) multiply by 18.2.

**COLLECTION**

**Patient Preparation:**
- Patient should refrain from taking manganese supplements at least 3 days before collection of sample.

**Sample Type:**
- EDTA whole blood

**Collect:**
- Navy blue top (EDTA) tube

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 2 mL blood

**Minimum Volume:**
- 1 mL blood

**Remarks:**
- To avoid contamination, use powderless gloves during phlebotomy.

- Transport specimen at on ice.

- Mix well, inverting gently 5x.

**PROCESSING**

**Test Code:**
- MN

**Test Group:**
- Manganese

**Sendout:**
Yes
Performing Lab: Quest

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Do NOT centrifuge. Do NOT transfer to another container. Order Quest # 4406

Preferred Volume:
2 mL blood
Minimum Volume:
1 mL blood

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
7-19 µg/L

Additional Information:
Manganese is an essential trace metal. Over 95% of manganese in blood is protein bound and therefore whole blood levels are higher than those derived from serum.

Toxicity that can result from excessive exposure can cause serious organ damage. Symptoms include Parkinsonian-like tremor and gait disturbances. Manganese is excreted in bile therefore patients with hepatic dysfunction/cholestasis and receiving manganese in TPN may be at increased risk for toxicity.

To convert µg/L to nmol/L (SI units) multiply by 18.2.

ADMINISTRATIVE

CPT Codes:
83785-90

LOINC Codes:
5681-2

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Manganese performed on whole blood is the preferred method to monitor for toxicity.

Test Code:
MN

Test Group:
Manganese

Performing Lab:
Quest

Sendout:
Yes

Performed:
Test performed Monday-Friday.

Methodology:
ICP/MS

Patient Preparation:
Patient should refrain from taking manganese supplements at least 3 days before collection of sample.

Remarks:
To avoid contamination, use powderless gloves during phlebotomy.
Transport specimen at on ice.

Mix well, inverting gently 5x.

**Collect:**
- Navy blue top (EDTA) tube

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- EDTA whole blood

**Preferred Volume:**
- 2 mL blood

**Minimum Volume:**
- 1 mL blood

**Specimen Preparation:**
- Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Do NOT centrifuge. Do NOT transfer to another container. Order Quest # 4406

**Units:**
- µg/L (mcg/L)

**Reference Interval:**
- 7-19 µg/L

**Reported:**
- 2-5 days.

**Additional Information:**
- Manganese is an essential trace metal. Over 95% of manganese in blood is protein bound and therefore whole blood levels are higher than those derived from serum.

- Toxicity that can result from excessive exposure can cause serious organ damage. Symptoms include Parkinsonian-like tremor and gait disturbances. Manganese is excreted in bile therefore patients with hepatic dysfunction/cholestasis and receiving manganese in TPN may be at increased risk for toxicity.

- To convert µg/L to nmol/L (SI units) multiply by 18.2.

**CPT Codes:**
- 83785-90

**LOINC Codes:**
- 5681-2
Manganese, urine
MOLT

ORDERING

Ordering Recommendations:
Urine levels do not correlate well with toxic symptoms. Whole blood levels are the preferred test for assessing for manganese toxicity.

Available Stat:
No

Performing Lab:
Quest

Methodology:
ICP/MS

Reported:
Test performed Tuesday, Thursday, Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 18.2

COLLECTION

Sample Type:
24 hour urine collection or random urine

Collect:
Acid washed 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Manganese

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. For 24 hour urine order Quest # 42044N. For random urine order Quest # 84863N

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
Male: 0.5-3.0 µg/L
Female: 0.5-1.8 µg/L

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 18.2

ADMINISTRATIVE

CPT Codes:
83785-90

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Urine levels do not correlate well with toxic symptoms. Whole blood levels are the preferred test for assessing for manganese toxicity.

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Manganese

Performing Lab:
Quest

Sendout:
Yes

Methodology:
ICP/MS

Collect:
Acid washed 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)

Sample Type:
24 hour urine collection or random urine

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. For 24 hour urine order Quest # 42044N. For random urine order Quest # 84863N

Units:
µg/L (mcg/L)

Reference Interval:
Male: 0.5-3.0 µg/L
Female: 0.5-1.8 µg/L

Reported:
Test performed Tuesday, Thursday, Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 18.2

CPT Codes:
83785-90
**Mannose Binding Lectin**

**MBL**

**ORDERING**

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
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<tbody>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Enzyme Linked Immunosorbent Immunoassay (ELISA)</td>
</tr>
<tr>
<td>Reported:</td>
<td>7-10 days</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>Mannan-Binding Lectin (MBL) is considered an important component of the innate immune system. Clinical studies have used 50 or 100 ng/mL to define severe MBL deficiency. MBL is also known to activate the classical complement pathway through its binding to serine proteases MASP-2 and MASP-1. MBL deficiency has been associated with recurrent infections in children 6 months to 17 months of age, during the time when the adaptive immune system (IgG production) is not fully mature. In conjunction with clinical findings and other laboratory tests, the deficiency of Mannose Binding Lectin (MBL) can be used to aid in the determination of susceptibility to infection.</td>
</tr>
</tbody>
</table>

**COLLECTION**

| Patient Preparation: | Overnight fasting is preferred but not required |
| Sample Type:         | Serum |
| Collect:             | Red top or Gold top |
| Amount to Collect:   | 2 mL blood |
| Preferred Volume:    | 1 mL serum |
| Minimum Volume:      | 0.3 mL serum |
| Stability (from collection to initiation): | Room temperature 4 hours, refrigerated 4 hours, frozen 3 weeks. |
| Unacceptable Conditions: | Hemolyzed or lipemic samples |
| Rejection Criteria:  | Hemolyzed, lipemic or thawed samples |

**PROCESSING**

| Test Code: | MBL |
| Sendout:    | Yes |
| Performing Lab: | Quest |
| Specimen Preparation: | Aliquot serum and freeze. Ship frozen to CB |
| Preferred Volume: | 1 mL serum |
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Hemolyzed or lipemic samples

Rejection Criteria:
Hemolyzed, lipemic or thawed samples

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 4 hours, frozen 3 weeks.

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
>= 100 ng/mL

Additional Information:
Mannan-Binding Lectin (MBL) is considered an important component of the innate immune system. Clinical studies have used 50 or 100 ng/mL to define severe MBL deficiency. MBL is also known to activate the classical complement pathway through its binding to serine proteases MASP-2 and MASP-1. MBL deficiency has been associated with recurrent infections in children 6 months to 17 months of age, during the time when the adaptive immune system (IgG production) is not fully mature.

In conjunction with clinical findings and other laboratory tests, the deficiency of Mannose Binding Lectin (MBL) can be used to aid in the determination of susceptibility to infection.

ADMINISTRATIVE

CPT Codes:
83520-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MBL

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Enzyme Linked Immunosorbent Immunoassay (ELISA)

Patient Preparation:
Overnight fasting is preferred but not required

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Rejection Criteria:
Hemolyzed, lipemic or thawed samples
Unacceptable Conditions:
- Hemolyzed or lipemic samples

Specimen Preparation:
- Aliquot serum and freeze. Ship frozen to CB

Units:
- ng/mL

Reference Interval:
- >= 100 ng/mL

Stability (from collection to initiation):
- Room temperature 4 hours, refrigerated 4 hours, frozen 3 weeks.

Reported:
- 7-10 days

Additional Information:
- Mannan-Binding Lectin (MBL) is considered an important component of the innate immune system. Clinical studies have used 50 or 100 ng/mL to define severe MBL deficiency. MBL is also known to activate the classical complement pathway through its binding to serine proteases MASP-2 and MASP-1. MBL deficiency has been associated with recurrent infections in children 6 months to 17 months of age, during the time when the adaptive immune system (IgG production) is not fully mature.

In conjunction with clinical findings and other laboratory tests, the deficiency of Mannose Binding Lectin (MBL) can be used to aid in the determination of susceptibility to infection.

CPT Codes:
- 83520-90
MaTa Antibody
MATAB

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Western blot
Reported:
10-12 days
Synonyms:
- Ma Ab
- Ma antibody
- Ta Ab
- Ta antibody
- Ma2 Antibody

COLLECTION

Sample Type:
Serum or CSF
Collect:
Red top, Gold top, CSF tube or sterile collection tube
Amount to Collect:
Blood: 4 mL
CSF: 2mL
Preferred Volume:
Serum or CSF: 2 mL
Minimum Volume:
Serum or CSF: 1 mL
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen indefinite

PROCESSING

Test Code:
MATAB
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze sample. Ship to CB frozen.
Preferred Volume:
Serum or CSF: 2 mL
Minimum Volume:
Serum or CSF: 1 mL
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen indefinite
RESULT INTERPRETATION

Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
84182-90

COMPLETE VIEW

Available Stat:
No
Test Code:
MATAB
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Western blot
Collect:
Red top, Gold top, CSF tube or sterile collection tube
Amount to Collect:
Blood: 4 mL
CSF: 2mL
Sample Type:
Serum or CSF
Preferred Volume:
Serum or CSF: 2 mL
Minimum Volume:
Serum or CSF: 1 mL
Specimen Preparation:
Aliquot and freeze sample. Ship to CB frozen.
Reference Interval:
Negative
Synonyms:
- Ma Ab
- Ma antibody
- Ta Ab
- Ta antibody
- Ma2 Antibody
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen indefinite
Reported:
10-12 days
CPT Codes:
84182-90
Maternal Cell Contamination
MCC

ORDERING

Ordering Recommendations:
Contamination of prenatal amniotic fluid or chorionic villi samples with maternal cells or tissue may lead to misinterpretation of prenatal diagnostic tests, particularly in determination of true fetal heterozygosity. Maternal contamination of prenatal samples is assessed by genotyping maternal and fetal DNA at fourteen different autosomal short-tandem repeats loci with heterozygosity rates ranging from 70-93%. In addition, a short-tandem repeat in each the X and Y chromosome is also included in the panel to supplement the autosomal markers and to identify sex chromosomes aneuploidies. This assay has the ability to detect maternal DNA contamination in as low as 3% of fetal DNA.

Available Stat:
No

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed, Monday or Wednesday, day shift only

Methodology:
PCR and capillary electrophoresis

Reported:
10-14 days

Additional Information:
Contamination of prenatal amniotic fluid or chorionic villi samples with maternal cells or tissue may lead to misinterpretation of prenatal diagnostic tests, particularly in determination of true fetal heterozygosity. Maternal contamination of prenatal samples is assessed by genotyping maternal and fetal DNA at fourteen different autosomal short-tandem repeats loci with heterozygosity rates ranging from 70-93%. In addition, a short-tandem repeat in each the X and Y chromosome is also included in the panel to supplement the autosomal markers and to identify sex chromosomes aneuploidies. This assay has the ability to detect maternal DNA contamination in as low as 3% of fetal DNA.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA

COLLECTION

Sample Type:
EDTA whole blood from mother of fetus. Should only be ordered in conjunction with prenatal genetic testing on either amniotic fluid or chorionic villi.

Collect:
Lavender top preferred Blue top (Citrate) and Yellow top (ACD) acceptable

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
1.5 mL blood

Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Unacceptable Conditions:
Heparinized whole blood received.

PROCESSING

Test Code:
Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable

Preferred Volume:
3 mL blood

Minimum Volume:
1.5 mL blood

Unacceptable Conditions:
Heparinized whole blood received.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Contamination of prenatal amniotic fluid or chorionic villi samples with maternal cells or tissue may lead to misinterpretation of prenatal diagnostic tests, particularly in determination of true fetal heterozygosity. Maternal contamination of prenatal samples is assessed by genotyping maternal and fetal DNA at fourteen different autosomal short-tandem repeats loci with heterozygosity rates ranging from 70-93%. In addition, a short-tandem repeat in each the X and Y chromosome is also included in the panel to supplement the autosomal markers and to identify sex chromosomes aneuploidies. This assay has the ability to detect maternal DNA contamination in as low as 3% of fetal DNA.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA

ADMINISTRATIVE

CPT Codes:
81265

LDT or Modified FDA:
Yes

LOINC Codes:
35457-1

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Contamination of prenatal amniotic fluid or chorionic villi samples with maternal cells or tissue may lead to misinterpretation of prenatal diagnostic tests, particularly in determination of true fetal heterozygosity. Maternal contamination of prenatal samples is assessed by genotyping maternal and fetal DNA at fourteen different autosomal short-tandem repeats loci with heterozygosity rates ranging from 70-93%. In addition, a short-tandem repeat in each the X and Y chromosome is also included in the panel to supplement the autosomal markers and to identify sex chromosomes aneuploidies. This assay has the ability to detect maternal DNA contamination in as low as 3% of fetal DNA.

Test Code:
MCC

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed, Monday or Wednesday, day shift only

Methodology:
PCR and capillary electrophoresis
Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top preferred Blue top (Citrate) and Yellow top (ACD) acceptable

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood from mother of fetus. Should only be ordered in conjunction with prenatal genetic testing on either amniotic fluid or chorionic villi.

Preferred Volume:
3 mL blood

Minimum Volume:
1.5 mL blood

Unacceptable Conditions:
Heparinized whole blood received.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable

Reference Interval:
Negative

Reported:
10-14 days

Additional Information:
Contamination of prenatal amniotic fluid or chorionic villi samples with maternal cells or tissue may lead to misinterpretation of prenatal diagnostic tests, particularly in determination of true fetal heterozygosity. Maternal contamination of prenatal samples is assessed by genotyping maternal and fetal DNA at fourteen different autosomal short-tandem repeats loci with heterozygosity rates ranging from 70-93%. In addition, a short-tandem repeat in each the X and Y chromosome is also included in the panel to supplement the autosomal markers and to identify sex chromosomes aneuploidies. This assay has the ability to detect maternal DNA contamination in as low as 3% of fetal DNA.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

These tests were developed and their performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. They have not been cleared or approved by the U.S. FDA.

CPT Codes:
81265

LDT or Modified FDA:
Yes

LOINC Codes:
35457-1
Measles Antibody, CSF, IgG
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Focus
Methodology:
IFA
Reported:
Test run Sunday-Thursday. Turnaround time: 2-5 days
Synonyms:
- sspe
- subacute sclerosing panencephalitis
- rubeola

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL CSF
Minimum Volume:
0.25 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Measles
Sendout:
Yes
Performing Lab:
Focus
Specimen Preparation:
Refrigerate. Order MRL #60690
Preferred Volume:
1 mL CSF
Minimum Volume:
0.25 mL CSF

RESULT INTERPRETATION

Reference Interval:
Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: Measles
Performing Lab: Focus
Sendout: Yes
Methodology: IFA
Remarks: Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect: CSF tube or sterile collection tube
Amount to Collect: See preferred volume
Sample Type: CSF
Preferred Volume: 1 mL CSF
Minimum Volume: 0.25 mL CSF
Specimen Preparation: Refrigerate. Order MRL #60690
Reference Interval: Neagtive: IgG < 1:64
Synonyms: • sspe
           • subacute sclerosing panencephalitis
           • rubeola
Reported: Test run Sunday-Thursday. Turnaround time: 2-5 days
Measles Antibody, IgG, serum
MEAI

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday - Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:
Sera are screened for IgG antibody. Samples are not retained for comparative testing with a later sample.

Results are reported as 'Positive', 'Negative', or Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

For diagnosis of acute primary infection, culture is a more rapid and generally more suitable technique, particularly where immune competence is in question.

Synonyms:
- sspe
- subacute sclerosing panencephalitis
- rubeola

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code: MEAI
Test Group: Measles
Performing Lab: Immunology
Specimen Preparation:
Freeze sample at -20C
Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

RESULT INTERPRETATION

Units:
AU/mL

Reference Interval:
Negative / Not-immune: < 25.0
Equivocal: 25.0 - 29.9
Positive / Immune: >= 30.0

Additional Information:
Sera are screened for IgG antibody. Samples are not retained for comparative testing with a later sample.

Results are reported as 'Positive', 'Negative', or Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

For diagnosis of acute primary infection, culture is a more rapid and generally more suitable technique, particularly where immune competence is in question.

ADMINISTRATIVE

CPT Codes:
86765

LOINC Codes:
35275-7

COMPLETE VIEW

Available Stat:
No

Test Code:
MEAI

Test Group:
Measles

Performing Lab:
Immunology

Performed:
Monday - Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples
Specimen Preparation:
Freeze sample at -20C

Units:
AU/mL

Reference Interval:
Negative / Not-immune: < 25.0
Equivocal: 25.0 - 29.9
Positive / Immune: >= 30.0

Synonyms:
- sspe
- subacute sclerosing panencephalitis
- rubeola

Reported:
1-4 days

Additional Information:
Sera are screened for IgG antibody. Samples are not retained for comparative testing with a later sample.

Results are reported as 'Positive', 'Negative', or 'Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

For diagnosis of acute primary infection, culture is a more rapid and generally more suitable technique, particularly where immune competence is in question.

CPT Codes:
86765

LOINC Codes:
35275-7
Measles virus RNA
P319

ORDERING

Approval Required:
Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Available Stat:
No

Performing Lab:
State Viral & Rickettsial Disease Lab

Methodology:
PCR, serology, molecular genotyping

Reported:
PCR 1 week Culture 3 weeks

Additional Information:
The PCR results should always be interpreted in conjunction with serologic testing for IgM and IgG and thorough assessment of the relevant clinical and epidemiological risk factors.

Synonyms:
• Rubeola

COLLECTION

Sample Type:
Nasopharyngeal flocked swab
Random urine
Serum

Collect:
Universal Transport Medium
Urine cup
Red top

Amount to Collect:
Nasopharyngeal flocked swab x1
Urine 50 mL
Blood 4 mL

Preferred Volume:
Nasopharyngeal flocked swab x1
Urine 50 mL
Serum 2 mL

Minimum Volume:
Nasopharyngeal flocked swab x1
Urine 10 mL
Serum 1 mL

Remarks:
Patient's physician must complete Viral & Rickettsial Disease Specimen Submittal Form.

Click here for form together with a routine laboratory requisition requesting this test.

Collect nasopharyngeal swab for PCR within 9 days after rash onset. Collect urine for PCR within 10 days after rash onset. Measles can frequently be detected in the urine later in the infection (up to 10 days - sometimes longer) when it can no longer be detected in respiratory samples.

Stability (from collection to initiation):
Refrigerated 2 days.

Unacceptable Conditions:
Nasopharyngeal swab not collected using flocked swab and/or not submitted in Universal Transport Medium
PROCESSING

Test Code: P319
Test Group: Measles
Sendout: Yes
Performing Lab: State Viral & Rickettsial Disease Lab

Specimen Preparation:
Specimen is sent out by Microbiology.
Order P319 and freetext at T319 prompt: Measles virus

If blood is sent with the specimen, separate serum by centrifugation. Refrigerate specimens and give form and copy of requisition to supervisor. If unable to send out within 48 hrs, freeze specimens at -70°C. Before freezing urine, centrifuge urine at 3000 rpm for 15 mins 500-600 g for 5-10 min at 4C, discard supernatant, and re-suspend pellet in 2-3 ml viral holding medium. Pool sediment when urine is centrifuged in more than one tube. Supervisor is to complete SFDPH Lab request form.

Send specimens with cold packs, or dry ice if frozen at -70°C, and both forms to SFDPH Lab. SFDPH will forward specimens to State Viral and Rickettsial Disease Laboratory.

Preferred Volume:
- Nasopharyngeal flocked swab x1
- Urine 50 mL
- Serum 2 mL

Minimum Volume:
- Nasopharyngeal flocked swab x1
- Urine 10 mL
- Serum 1 mL

Unacceptable Conditions:
Nasopharyngeal swab not collected using flocked swab and/or not submitted in Universal Transport Medium

Stability (from collection to initiation):
Refrigerated 2 days.

RESULT INTERPRETATION

Reference Interval:
No virus detected

Additional Information:
The PCR results should always be interpreted in conjunction with serologic testing for IgM and IgG and thorough assessment of the relevant clinical and epidemiological risk factors.

COMPLETE VIEW

Approval Required:
Patient’s physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Available Stat:
No

Test Code: P319
Test Group: Measles
Performing Lab: State Viral & Rickettsial Disease Lab
Sendout:
Methodology:
PCR, serology, molecular genotyping

Remarks:
Patient’s physician must complete Viral & Rickettsial Disease Specimen Submittal Form.
Click here for form together with a routine laboratory requisition requesting this test.

Collect nasopharyngeal swab for PCR within 9 days after rash onset. Collect urine for PCR within 10 days after rash onset. Measles can frequently be detected in the urine later in the infection (up to 10 days - sometimes longer) when it can no longer be detected in respiratory samples.

Collect:
Universal Transport Medium
Urine cup
Red top

Amount to Collect:
Nasopharyngeal flocked swab x1
Urine 50 mL
Blood 4 mL

Sample Type:
Nasopharyngeal flocked swab
Random urine
Serum

Preferred Volume:
Nasopharyngeal flocked swab x1
Urine 50 mL
Serum 2 mL

Minimum Volume:
Nasopharyngeal flocked swab x1
Urine 10 mL
Serum 1 mL

Unacceptable Conditions:
Nasopharyngeal swab not collected using flocked swab and/or not submitted in Universal Transport Medium

Specimen Preparation:
Specimen is sent out by Microbiology.

Order P319 and freetext at T319 prompt: Measles virus

If blood is sent with the specimen, separate serum by centrifugation. Refrigerate specimens and give form and copy of requisition to supervisor. If unable to send out within 48 hrs, freeze specimens at -70°C. Before freezing urine, centrifuge urine at 3000 rpm for 15 mins 500-600 g for 5-10 min at 4C, discard supernatant, and re-suspend pellet in 2-3 ml viral holding medium. Pool sediment when urine is centrifuged in more than one tube. Supervisor is to complete SFDPH Lab request form.

Send specimens with cold packs, or dry ice if frozen at -70°C, and both forms to SFDPH Lab. SFDPH will forward specimens to State Viral and Rickettsial Disease Laboratory.

Reference Interval:
No virus detected

Synonyms:
- Rubeola

Stability (from collection to initiation):
Refrigerated 2 days.

Reported:
PCR 1 week Culture 3 weeks

Additional Information:
The PCR results should always be interpreted in conjunction with serologic testing for IgM and IgG and thorough assessment of the relevant clinical and epidemiological risk factors.
Mercury, 24 hour urine
HGU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively-Coupled Plasma/Mass Spectrometry
Reported:
Test run Tuesday-Saturday. Turnaround: 2-5 days.
Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.00499. Urine is the specimen of choice for exposure to inorganic mercury.
Synonyms:
- Hg
- heavy metal toxicity
- heavy metal poisoning
- heavy metals

COLLECTION

Patient Preparation:
The patient should not eat predatory fish such as tuna, swordfish and shark for at least 3 days prior to sample collection.
Sample Type:
24 hour urine collection
Collect:
Acid washed 24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine

PROCESSING

Test Code:
HGU
Test Group:
Mercury
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Order Quest # 7849N
Preferred Volume:
10 mL urine
Minimum Volume:
5 mL urine
RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
Normal >= 20 µg/L (Varies w/diet) Toxic >= 150 µg/L

Critical Values:
Quest Priority-1: >= 150 µg/L

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.00499. Urine is the specimen of choice for exposure to inorganic mercury.

ADMINISTRATIVE

CPT Codes:
83825-90

LOINC Codes:
21383-5

COMPLETE VIEW

Available Stat:
No

Test Code:
HGU

Test Group:
Mercury

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively-Coupled Plasma/Mass Spectrometry

Patient Preparation:
The patient should not eat predatory fish such as tuna, swordfish and shark for at least 3 days prior to sample collection.

Collect:
Acid washed 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
10 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate. Order Quest # 7849N

Units:
µg/L (mcg/L)

Reference Interval:
Normal >= 20 µg/L (Varies w/diet) Toxic >= 150 µg/L

Critical Values:
Quest Priority-1: >= 150 µg/L

Synonyms:
• Hg
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

**Reported:**
Test run Tuesday-Saturday. Turnaround: 2-5 days.

**Additional Information:**
To convert µg/L to µmol/L (SI units) multiply by 0.00499. Urine is the specimen of choice for exposure to inorganic mercury.

**CPT Codes:**
83825-90

**LOINC Codes:**
21383-5
Mercury, blood
HG

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: CVAA-FI
Reported: Test run Wednesday & Friday. Turnaround: 2-5 days.
Additional Information: To convert µg/L to µmol/L (SI units) multiply by 4.99. Blood is the preferred sample for poisoning w/ methyl mercury and other organic mercurials (e.g., thiomersal).
Synonyms: • Hg • heavy metal toxicity • heavy metal poisoning • heavy metals

COLLECTION

Sample Type: EDTA whole blood
Collect: Navy blue top (EDTA) tube
Amount to Collect: 5 mL blood
Preferred Volume: 5 mL blood
Minimum Volume: 2 mL blood
Remarks: Mix well, inverting gently 5x.

PROCESSING

Test Code: HG
Test Group: Mercury
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Follow the detailed processing instructions for Trace Metal Analysis. Do NOT centrifuge or transfer to another container. Refrigerate. Order Quest # 56853N.
Preferred Volume: 5 mL blood
Minimum Volume:
RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
<= 10 µg/L
Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 4.99. Blood is the preferred sample for poisoning w/ methyl mercury and other organic mercurials (e.g., thiomersal).

ADMINISTRATIVE

CPT Codes:
83825-90
LOINC Codes:
5685-3

COMPLETE VIEW

Available Stat:
No
Test Code:
HG
Test Group:
Mercury
Performing Lab:
Quest
Sendout:
Yes
Methodology:
CVAA-FI
Remarks:
Mix well, inverting gently 5x.
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
5 mL blood
Sample Type:
EDTA whole blood
Preferred Volume:
5 mL blood
Minimum Volume:
2 mL blood
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Do NOT centrifuge or transfer to another container. Refrigerate. Order Quest # 56853N.
Units:
µg/L (mcg/L)
Reference Interval:
<= 10 µg/L
Synonyms:
• Hg
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

Reported:
Test run Wednesday & Friday. Turnaround: 2-5 days.

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 4.99. Blood is the preferred sample for poisoning w/ methyl mercury and other organic mercurials (e.g., thiomerosal).

CPT Codes:
83825-90

LOINC Codes:
5685-3
Mercury, random urine
HGUR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Inductively-Coupled Plasma/Mass Spectrometry
Reported:
Performed 5 days per week. Turn around 3-5 days.
Synonyms:
• Hg
• heavy metal toxicity
• heavy metal poisoning
• heavy metals

COLLECTION

Patient Preparation:
 Patient should refrain from eating predatory fish such as swordfish, tuna and shark at least three days prior to specimen collection.
Sample Type:
Random urine (2nd void)
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
14 mL urine
Minimum Volume:
5 mL urine
Remarks:
Wash hands before sample collection. Wipe hand dry with lint free paper towel. Do not use recycled paper. Collect aliquot of the second morning urine. For industrial monitoring, collect urine preshift.
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks

PROCESSING

Test Code:
HGUR
Test Group:
Mercury
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Use powderless gloves to pour sample into acid-washed shipping container, if needed, Cap securely, freeze at -20°C and ship frozen to China Basin. Order Quest # 637
Preferred Volume:
14 mL urine
Minimum Volume:
5 mL urine

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks

RESULT INTERPRETATION

Units:
µg/g Creatinine (mcg/g Creatinine)

Reference Interval:
Nonexposed >= 18 year olds <= 4 µg/g creatinine Biologic exposure Index (preshift) <= 35 µg/g creatinine

Critical Values:
Quest Priority-1: >= 150 µg/g creatinine

ADMINISTRATIVE

CPT Codes:
82570-90, 83825-90

LOINC Codes:
13465-0

COMPLETE VIEW

Available Stat:
No

Test Code:
HGUR

Test Group:
Mercury

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Inductively-Coupled Plasma/Mass Spectrometry

Patient Preparation:
Patient should refrain from eating predatory fish such as swordfish, tuna and shark at least three days prior to specimen collection.

Remarks:
Wash hands before sample collection. Wipe hand dry with lint free paper towel. Do not use recycled paper. Collect aliquot of the second morning urine. For industrial monitoring, collect urine preshift.

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine (2nd void)

Preferred Volume:
14 mL urine

Minimum Volume:
5 mL urine

Specimen Preparation:
Use powderless gloves to pour sample into acid-washed shipping container, if needed, Cap securely, freeze at -20C and ship frozen to China Basin. Order Quest # 637

Units:
µg/g Creatinine (mcg/g Creatinine)

**Reference Interval:**
Nonexposed >= 18 year olds <= 4 µg/g creatinine Biologic exposure Index (preshift) <= 35 µg/g creatinine

**Critical Values:**
Quest Priority-1: >= 150 µg/g creatinine

**Synonyms:**
- Hg
- heavy metal toxicity
- heavy metal poisoning
- heavy metals

**Stability (from collection to initiation):**
Room temperature 2 days, refrigerated 5 days, frozen at -20°C 2 weeks

**Reported:**
Performed 5 days per week. Turn around 3-5 days.

**CPT Codes:**
82570-90, 83825-90

**LOINC Codes:**
13465-0
Metanephrines, 24 hour urine
METN

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS/MS

Reported:
Test performed Monday-Friday. Turnaround time: 3-6 days.

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 5.07 (using MW 197.2). Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

COLLECTION

Patient Preparation:
Patient should avoid tobacco, tea, coffee, for 3 days prior to specimen collection. It is preferable for the patient to be off medications for 3 days prior to collection. Common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Medications which are alpha agonists (Aldomet), alpha blockers (Dibenzyline) should be avoided 18-24 hrs prior to specimen collection.

Sample Type:
24 hour urine collection

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Preferred Volume:
10 mL urine
Minimum Volume:
3 mL urine

Remarks:
Obtain container from Specimen Receiving. Refrigerate container during collection

Stability (from collection to initiation):
Room temperature 1 week (acidified), refrigerated 8 days, frozen at -20C 1 month

PROCESSING

Test Code:
METN
Test Group:
Metanephrines

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Add additional 6N HCl if pH > 3. Refrigerate aliquot. Record the patient's age and total urine volume on the test request form and the transport vial. Order Quest# 19962X for Metanephrines, 24 hour urine. If ordered on a random sample order MOLT and request Quest test #14961X for random urine.

Preferred Volume:
10 mL urine
Minimum Volume:
3 mL urine
Stability (from collection to initiation):
    Room temperature 1 week (acidified), refrigerated 8 days, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Metanephrine (µg/d)</th>
<th>Normetanephrine (µg/d)</th>
<th>Metanephrine, Total (µg/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 months-4 years</td>
<td>25-117</td>
<td>54-249</td>
<td>79-345</td>
</tr>
<tr>
<td>5-9 years</td>
<td>11-139</td>
<td>31-398</td>
<td>49-408</td>
</tr>
<tr>
<td>10-13 years</td>
<td>51-275</td>
<td>67-503</td>
<td>110-714</td>
</tr>
<tr>
<td>14-17 years</td>
<td>40-189</td>
<td>69-531</td>
<td>107-741</td>
</tr>
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<td>25-222</td>
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<td>58-203</td>
<td>88-649</td>
<td>182-739</td>
</tr>
<tr>
<td>&gt;= 50 years</td>
<td>90-315</td>
<td>122-676</td>
<td>224-832</td>
</tr>
</tbody>
</table>

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 5.07 (using MW 197.2). Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

ADMINISTRATIVE

CPT Codes:
833835-90

COMPLETE VIEW

Available Stat:
No
Test Code:
METN
Test Group:
Metanephrines
Performing Lab:
Quest
Sendout:
Yes
Methodology:
LC/MS/MS
Patient Preparation:
Patient should avoid tobacco, tea, coffee, for 3 days prior to specimen collection. It is preferable for the patient to be off medications for 3 days prior to collection. Common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Medications which are alpha agonists (Aldomet), alpha blockers (Dibenzyline) should be avoided 18-24 hrs prior to specimen collection.
Remarks:
Obtain container from Specimen Receiving. Refrigerate container during collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Sample Type:
24 hour urine collection

Preferred Volume:
10 mL urine

Minimum Volume:
3 mL urine

Specimen Preparation:
Add additional 6N HCl if pH > 3. Refrigerate aliquot. Record the patient's age and the total urine volume on the test request form and the transport vial. Order Quest# 19962X for Metanephrines, 24 hour urine. If ordered on a random sample order MOLT and request Quest test #14961X for random urine.

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:

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<td>&gt;= 50 years</td>
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Stability (from collection to initiation):
Room temperature 1 week (acidified), refrigerated 8 days, frozen at -20C 1 month

Reported:
Test performed Monday-Friday. Turnaround time: 3-6 days.

Additional Information:
To convert µg/d to nmol/d (SI units) multiply by 5.07 (using MW 197.2). Creatinine is assayed as a measure of completeness of urine collection. If total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

CPT Codes:
83835-90
Metanephrines, Free, fractionated, plasma
METNF

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS

Additional Information:
Normetanephrine (NM) and metanephrine (MN) are the extra-neuronal catechol-o-methyltransferase (COMT) metabolites of the catecholamines norepinephrine and epinephrine, respectively. Measurement of plasma metanephrines is more sensitive (but may be less specific) than measurement of catecholamines for the detection of pheochromocytoma. Proper interpretation of results requires awareness of recent medication/drug history (e.g., antihypertensive agents, alcohol, cocaine) and other pre-analytical factors (e.g., stress, severe congestive heart failure, myocardial infarction) that influence release of catecholamines and metanephrines.

Synonyms:
- Metanephrines, plasma
- plasma metanephrines

COLLECTION

Patient Preparation:
Patient should be relaxed in either a supine or upright position before blood is drawn. Patients should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection. Overnight fasting is preferred.

Sample Type:
Plasma

Collect:
Lavender top 6 mL (on ice)

Amount to Collect:
6 mL blood

Preferred Volume:
2.5 mL plasma

Minimum Volume:
1.5 mL plasma

Remarks:
Draw specimen in a pre-chilled EDTA Lavender top (6 mL) and send to Lab on ICE.

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 2 weeks, frozen at -20°C 2 weeks.

PROCESSING

Test Code:
METNF
Test Group:
Metanephrines
Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Maintain on ice until centrifuged. Separate the plasma within 2 hours of venipuncture. Freeze plasma immediately. Store frozen at -20°C.
Ship on dry ice to China Basin. Order Quest test # 19548.
Preferred Volume:
2.5 mL plasma

Minimum Volume:
1.5 mL plasma

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 2 weeks, frozen at -20°C 2 weeks.

RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:
 Metanephrine: <= 57 pg/mL
 Normetanephrine: <= 148 pg/mL
 Total: <= 205 pg/mL

Additional Information:
Normetanephrine (NM) and metanephrine (MN) are the extra-neuronal catechol-o-methyltransferase (COMT) metabolites of the catecholamines norepinephrine and epinephrine, respectively. Measurement of plasma metanephrines is more sensitive (but may be less specific) than measurement of catecholamines for the detection of pheochromocytoma. Proper interpretation of results requires awareness of recent medication/drug history (e.g., antihypertensive agents, alcohol, cocaine) and other pre-analytical factors (e.g., stress, severe congestive heart failure, myocardial infarction) that influence release of catecholamines and metanephrines.

ADMINISTRATIVE

CPT Codes:
83835-90

COMPLETE VIEW

Available Stat:
No

Test Code:
METNF

Test Group:
Metanephrines

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Patient Preparation:
Patient should be relaxed in either a supine or upright position before blood is drawn. Patients should avoid alcohol, coffee, tea, tobacco and strenuous exercise prior to collection. Overnight fasting is preferred.

Remarks:
Draw specimen in a pre-chilled EDTA Lavender top (6 mL) and send to Lab on ICE.

Collect:
Lavender top 6 mL (on ice)

Amount to Collect:
6 mL blood

Sample Type:
Plasma

Preferred Volume:
2.5 mL plasma

Minimum Volume:
1.5 mL plasma
Specimen Preparation:
Maintain on ice until centrifuged. Separate the plasma within 2 hours of venipuncture. Freeze plasma immediately. Store frozen at -20C. Ship on dry ice to China Basin. Order Quest test # 19548.

Units:
pg/mL

Reference Interval:
- Metanephrine: <= 57 pg/mL
- Normetanephrine: <= 148 pg/mL
- Total: <= 205 pg/mL

Synonyms:
- Metanephrines, plasma
- plasma metanephrines

Stability (from collection to initiation):
Room temperature 4 hours, refrigerated 2 weeks, frozen at -20C 2 weeks.

Additional Information:
Normetanephrine (NM) and metanephrine (MN) are the extra-neuronal catechol-o-methyltransferase (COMT) metabolites of the catecholamines norepinephrine and epinephrine, respectively. Measurement of plasma metanephrines is more sensitive (but may be less specific) than measurement of catecholamines for the detection of pheochromocytoma. Proper interpretation of results requires awareness of recent medication/drug history (e.g., antihypertensive agents, alcohol, cocaine) and other pre-analytical factors (e.g., stress, severe congestive heart failure, myocardial infarction) that influence release of catecholamines and metanephrines.

CPT Codes:
83835-90
Metanephrines, random urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS

COLLECTION

Patient Preparation:
Patient should avoid tobacco, tea, coffee, for 3 days prior to specimen collection.
It is preferable for the patient to be off medications for 3 days prior to collection.
Common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Medications which are alpha agonists (Aldomet), alpha blockers (Dibenzyline) should be avoided 18-24 hrs prior to specimen collection.

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
5 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
1.5 mL urine
Stability (from collection to initiation):
Acidified urine: Room temperature 1 week, refrigerated 8 days, frozen at -20C 1 month

PROCESSING

Test Code:
METNR
Test Group:
Metanephrines
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Acidify urine to pH < 3.0 with 6N HCl. Freeze acidified urine at -20C Order Quest test #14961X
Preferred Volume:
5 mL urine
Minimum Volume:
1.5 mL urine
Stability (from collection to initiation):
Acidified urine: Room temperature 1 week, refrigerated 8 days, frozen at -20C 1 month
RESULT INTERPRETATION

Units:
µg/g creatinine

Reference Interval:

Metanephrine:
3 mo-4 years Not established
5-9 years  106-257 µg/g creatinine
10-13 years 34-357 µg/g creatinine
14-17 years  24-302 µg/g creatinine
18-29 years  39-146 µg/g creatinine
30-39 years  32-134 µg/g creatinine
40-49 years  33-192 µg/g creatinine
>=50 years   21-153 µg/g creatinine

Normetanephrine:
3 months-4 years Not Established
5-9 years  149-781 µg/g creatinine
10-13 years 38-523 µg/g creatinine
14-17 years  14-302 µg/g creatinine
18-29 years  91-365 µg/g creatinine
30-39 years  67-390 µg/g creatinine
40-49 years  85-514 µg/g creatinine
>=50 years   108-524 µg/g creatinine

Total metanephrines:
3 months-4 years Not Established
5-9 years  255-1167 µg/g creatinine
10-13 years 86-845 µg/g creatinine
14-17 years 39-578 µg/g creatinine
18-29 years 156-442 µg/g creatinine
30-39 years 94-445 µg/g creatinine
40-49 years 155-608 µg/g creatinine
>=50 years   149-603 µg/g creatinine

ADMINISTRATIVE

CPT Codes:
82570-90, 83835-90

LOINC Codes:
13771-1

COMPLETE VIEW

Available Stat:
No

Test Code:
METNR

Test Group:
Metanephrines

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS
Patient Preparation:
Patient should avoid tobacco, tea, coffee, for 3 days prior to specimen collection.

It is preferable for the patient to be off medications for 3 days prior to collection.

Common antihypertensives (diuretics, ACE inhibitors, calcium channel blockers, alpha and beta blockers) cause minimal or no interference. Medications which are alpha agonists (Aldomet), alpha blockers (Dibenzyline) should be avoided 18-24 hrs prior to specimen collection.

Collect:
Urine cup

Amount to Collect:
5 mL urine

Sample Type:
Random urine

Preferred Volume:
5 mL urine

Minimum Volume:
1.5 mL urine

Specimen Preparation:
Acidify urine to pH < 3.0 with 6N HCl. Freeze acidified urine at -20C Order Quest test #14961X

Units:
µg/g creatinine

Reference Interval:
Metanephrine:
3 mo-4 years Not established
5-9 years 106-257 µg/g creatinine
10-13 years 34-357 µg/g creatinine
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18-29 years 156-442 µg/g creatinine
30-39 years 94-445 µg/g creatinine
40-49 years 155-608 µg/g creatinine
>=50 years 149-603 µg/g creatinine

Stability (from collection to initiation):
Acidified urine: Room temperature 1 week, refrigerated 8 days, frozen at -20C 1 month

CPT Codes:
82570-90, 83835-90

LOINC Codes:
13771-1
**Metaphase / Interphase FISH**

**CYFMB**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily, Monday-Friday

**Methodology:**
- Fluorescent in-situ hybridization

**Reported:**
- 7-14 days

**Additional Information:**

A normal result indicates that there was no evidence of a deletion present. However, this does not exclude the possibility that an undetected mutation exists.

**Non-Oncology probes:**
Submicroscopic deletions in the regions listed below, associated with the specified syndromes, are detected by the examination of 10 metaphase cells using the appropriate probe set with an internal control. A normal result indicates there was no evidence of deletions or other abnormal hybridization patterns.

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Test Code</th>
<th>Locus/Gene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolf Hirshhorn</td>
<td>WHS</td>
<td>4p16</td>
</tr>
<tr>
<td>Cri du Chat</td>
<td>CDCR</td>
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</tr>
<tr>
<td>Williams</td>
<td>WMS</td>
<td>7q11.23</td>
</tr>
<tr>
<td>Retinoblastoma</td>
<td>RB1</td>
<td>13q14</td>
</tr>
<tr>
<td>Prader Willi</td>
<td>PW</td>
<td>SNRPN/CEP15/D15S10</td>
</tr>
<tr>
<td>Smith Magenis</td>
<td>SMS</td>
<td>17p11.2</td>
</tr>
<tr>
<td>Miller Dieker</td>
<td>MDIE</td>
<td>17p13.3</td>
</tr>
<tr>
<td>DiGeorge/VCF/distal 22q TUPLE1/ARSA</td>
<td>DGS</td>
<td>22q11.2/22q13</td>
</tr>
<tr>
<td>Kallman syndrome</td>
<td>KAL</td>
<td>Xp22.3</td>
</tr>
<tr>
<td>Steroid sulfatase deficiency</td>
<td>STSD</td>
<td>Xp22.3</td>
</tr>
<tr>
<td>SRY Region</td>
<td>SRY</td>
<td>Yp11.3</td>
</tr>
<tr>
<td>Angelman</td>
<td>AGM</td>
<td>D15S10/CEP15/PML</td>
</tr>
<tr>
<td>XY metaphase FISH</td>
<td>CYXY</td>
<td>CEPX/DYZ1</td>
</tr>
<tr>
<td>14/22 FISH</td>
<td>MAR</td>
<td>FISH for marker chromosome</td>
</tr>
</tbody>
</table>

**Oncology probes:**
- The DNA methylation test "PWA" must be done prior to the FISH test for microdeletion detection for Prader Willi/Angelman syndrome.
- See Molecular Diagnostics-test Prader Willi/Angelman for sample collection information.

**Name** | **Test code**
--- | ---
BCR/ABL | TR922
PML/RARA | TR1517
Trisomy 8 | TRIS8
Monosomy 7/Deletion 7q | M7D7Q
Donor/Sex Specific (XXY) | XXXY
Monosomy 5/Deletion 5q | M5D5Q
MLL 11q23 | MLLQ23
Deletion 20q | DEL20Q
Duplication 1Q | DUP1Q
Deletion 13Q | DEL13Q
Translocation 4/14 | TR414
Translocation 11/14 | TR1114

**Printed 06/07/19**

Test information subject to change
Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

**Reflex Testing:**
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

**Synonyms:**
- Cytogenetic analysis
- microdeletion
- chromosome analysis
- inherited disorders
- oncology FISH
- non-oncology FISH
- Karyotype
- Karyotyping
- Wolf Hirshhorn
- 4p16
- Cri du Chat
- 5p15
- Williams
- 7q11.23
- Retinoblastoma
- 13q14
- Prader Willi
- Angelman
- SNRPN
- 15q11-q13
- Smith
- Magenis
- 17p11.2
- Miller Dieker
- 17p13.3
- DiGeorge
- distal 22q
- TUPLE1
- ARSA
• 22q11.2/22q13
• Kallman syndrome
• Xp22.3
• Steroid sulfatase deficiency
• SRY Region
• Yp11.3
• BCR/ABL
• PML/RARA
• Trisomy 8
• Monosomy 7/Deletion 7q
• Donor/Sex Specific (XXXY)
• Monosomy 5/Deletion 5q
• MLL 11q23
• Deletion 20q
• Duplication 1q
• Deletion 13q
• Translocation 4/14
• Translocation 11/14
• Translocation 14/16
• Deletion 17p
• Deletion 11q
• Trisomy 12
• Inv/Trans/del 16q
• Translocation 8:21
• Translocation 8/14
• Translocation 14/18
• 14q23 breakapart

COLLECTION

Sample Type:
Heparinized whole blood, Amniotic fluid, CVS, Unfixed tissue

Collect:
Blood: Dark green top
Amniotic fluid: Sterile screw top container
CVS or POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
See preferred volume

Preferred Volume:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic Fluid: 10 mL
CVS: 10 mg
POC: 10 mg

Minimum Volume:
Whole blood, child or adult: 3 mL
Whole blood, infant: 1 mL
Amniotic Fluid: 5 mL
CVS: 5 mg  
POC: 5 mg  

Remarks:  
Complete and submit a "UCSF Reproductive Genetics Lab Results" or a "UCSF Cytogenetic Requisition" form and send with the samples.

Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Stability (from collection to initiation):  
48 hours

Unacceptable Conditions:  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:  
CYFMB

Test Group:  
Chromosome Analysis

Performing Lab:  
Medical Genomics - Cytogenetics

Specimen Preparation:  
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Preferred Volume:  
Whole blood, child or adult: 10 mL  
Whole blood, infant: 3 mL  
Amniotic Fluid: 10 mL  
CVS: 10 mg  
POC: 10 mg

Minimum Volume:  
Whole blood, child or adult: 3 mL  
Whole blood, infant: 1 mL  
Amniotic Fluid: 5 mL  
CVS: 5 mg  
POC: 5 mg

Unacceptable Conditions:  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):  
48 hours

RESULT INTERPRETATION

Reference Interval:  
Normal. See Additional Information

Additional Information:  
A normal result indicates that there was no evidence of a deletion present. However, this does not exclude the possibility that an undetected mutation exists.

Non-Oncology probes:  
Submicroscopic deletions in the regions listed below, associated with the specified syndromes, are detected by the examination of 10 metaphase cells using the appropriate probe set with an internal control. A normal result indicates there was no evidence of deletions or other abnormal hybridization patterns.

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<td>13q14</td>
</tr>
<tr>
<td>Prader Willi</td>
<td>PW</td>
<td>SNRPN/CEP15/D15S10</td>
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Smith Magenis  SMS  17p11.2  
Miller Dieker  MDIE  17p13.3  
DiGeorge/VCF/distal 22q TUPLE1/ARSA DGS  22q11.2/22q13  
Kallman syndrome  KAL  Xp22.3  
Steroid sulfatase deficiency  STSD  Xp22.3  
SRY Region  SRY  Yp11.3  
Angelman  AGM  D15S10/CEP15/PML  
XY metaphase FISH  CYXY  CEPX/DYZ1  
14/22 FISH  MAR  FISH for marker chromosome

**The DNA methylation test “PWA” must be done prior the FISH test for microdeletion detection for Prader Willi/Angelman syndrome.**

See Molecular Diagnostics-test Prader Willi/Angelman for sample collection information.

Oncology probes:

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<td>M7D7Q</td>
</tr>
<tr>
<td>Donor/Sex Specific (XXY)</td>
<td>XXXY</td>
</tr>
<tr>
<td>Monosomy 5/Deletion 5q</td>
<td>M5D5Q</td>
</tr>
<tr>
<td>MLL 11q23</td>
<td>MLLQ23</td>
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<tr>
<td>Deletion 20q</td>
<td>DEL20Q</td>
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<tr>
<td>Duplication 1Q</td>
<td>DUP1Q</td>
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<td>DEL13Q</td>
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<tr>
<td>Translocation 4/14</td>
<td>TR414</td>
</tr>
<tr>
<td>Translocation 11/14</td>
<td>TR1114</td>
</tr>
<tr>
<td>Translocation 14/16</td>
<td>TR1416</td>
</tr>
<tr>
<td>Deletion 17p</td>
<td>DEL17P</td>
</tr>
<tr>
<td>Deletion 11q</td>
<td>DEL11Q</td>
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<td>Trisomy 12</td>
<td>TRIS12</td>
</tr>
<tr>
<td>Inv/Trans/del 16q</td>
<td>INV16Q</td>
</tr>
<tr>
<td>Translocation 8:21</td>
<td>TR821</td>
</tr>
<tr>
<td>Translocation 8/14</td>
<td>TR814</td>
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<tr>
<td>Translocation 14/18</td>
<td>TR1418</td>
</tr>
<tr>
<td>14q23 breakapart</td>
<td>IGHQ23</td>
</tr>
</tbody>
</table>

Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA ’88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

**ADMINISTRATIVE**

**CPT Codes:**

88273, 88271

**LDT or Modified FDA:**

Yes

**LOINC Codes:**

48818-9

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

CYFMB
Test Group:
Chromosome Analysis

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily, Monday-Friday

Methodology:
Fluorescent in-situ hybridization

Remarks:
Complete and submit a "UCSF Reproductive Genetics Lab Results" or a "UCSF Cytogenetic Requisition" form and send with the samples.

Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Collect:
Blood: Dark green top
Amniotic fluid: Sterile screw top container
CVS or POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
See preferred volume

Sample Type:
Heparinized whole blood, Amniotic fluid, CVS, Unfixed tissue

Preferred Volume:
Whole blood, child or adult: 10 mL
Whole blood, infant: 3 mL
Amniotic Fluid: 10 mL
CVS: 10 mg
POC: 10 mg

Minimum Volume:
Whole blood, child or adult: 3 mL
Whole blood, infant: 1 mL
Amniotic Fluid: 5 mL
CVS: 5 mg
POC: 5 mg

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Reference Interval:
Normal. See Additional Information

Synonyms:
- Cytogenetic analysis
- microdeletion
- chromosome analysis
- inherited disorders
- oncology FISH
- non-oncology FISH
- Karyotype
- Karyotyping
- Wolf Hirshhorn
- 4p16
- Cri du Chat
- 5p15
• Williams
• 7q11.23
• Retinoblastoma
• 13q14
• Prader Willi
• Angelman
• SNRPN
• 15q11-q13
• Smith
• Magenis
• 17p11.2
• Miller Dieker
• 17p13.3
• DiGeorge
• distal 22q
• TUPLE1
• ARSA
• 22q11.2/22q13
• Kallman syndrome
• Xp22.3
• Steroid sulfatase deficiency
• SRY Region
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• Deletion 11Q
• Trisomy 12
• Inv/Trans/del 16q
• Translocation 8:21
• Translocation 8/14
• Translocation 14/18
• 14q23 breakapart
Stability (from collection to initiation):
48 hours

Reported:
7-14 days

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Additional Information:
A normal result indicates that there was no evidence of a deletion present. However, this does not exclude the possibility that an undetected mutation exists.

Non-Oncology probes:
Submicroscopic deletions in the regions listed below, associated with the specified syndromes, are detected by the examination of 10 metaphase cells using the appropriate probe set with an internal control. A normal result indicates there was no evidence of deletions or other abnormal hybridization patterns.

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Test Code</th>
<th>Locus/Gene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolf Hirshhorn</td>
<td>WHS</td>
<td>4p16</td>
</tr>
<tr>
<td>Cri du Chat</td>
<td>CDCR</td>
<td>5p15</td>
</tr>
<tr>
<td>Williams</td>
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<td>AGM</td>
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<td>XY metaphase FISH</td>
<td>CYXY</td>
<td>CEPX/DYZ1</td>
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<td>14/22 FISH</td>
<td>MAR</td>
<td>FISH for marker chromosome</td>
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**The DNA methylation test “PWA” must be done prior the FISH test for microdeletion detection for Prader Willi/Angelman syndrome.

See Molecular Diagnostics-test Prader Willi/Angelman for sample collection information.

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CPT Codes:
88273, 88271

LDT or Modified FDA:
Yes

LOINC Codes:
48818-9
Methadone and Metabolite, Urine, Quantitative

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Methadone Urine Screen with Reflex to Quantitation (2012245) is preferred.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- Amidone
- Dolophine
- EDDP
- Heptadon
- Methadone
- Methadose
- Pain Management
- Pain Management, Methadone, Quantitative, with medMATCH, Urine
- Pain Management, Methadone, with Confirmation with medMATCH, Urine
- Physeptone
- Symoron

COLLECTION

Collect:
Random urine.

Amount to Collect:
1 mL

Preferred Volume:
1 mL

Minimum Volume:
0.5 mL

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
MEDQNT

ARUP Test Code:
Sendout: Yes
Performing Lab: ARUP
Specimen Preparation: Transfer 1 mL with no additives or preservatives urine to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Additional Processing Instructions: Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 0090362.
Preferred Volume: 1 mL
Minimum Volume: 0.5 mL
Unacceptable Conditions: Specimens exposed to repeated freeze/thaw cycles.
Stability (from collection to initiation): Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years
Storage/Transport Temperature: Room temperature.

RESULT INTERPRETATION

Reference Interval:

Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methadone</td>
<td>10 ng/mL</td>
</tr>
<tr>
<td>EDDP</td>
<td>10 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Positive cutoff: 10 ng/mL
For medical purposes only; not valid for forensic use.

The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. The concentration value must be greater than or equal to the cutoff to be reported as positive. Interpretive questions should be directed to the laboratory.

ADMINISTRATIVE

CPT Codes:
80358 (Alt code: G0480)
LOINC:
- 3774-7
- 50542-0

COMPLETE VIEW

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Methadone Urine Screen with Reflex to Quantitation (2012245) is preferred.
Test Code:
MEDQNT
ARUP Test Code: 0090362
Performing Lab: ARUP
Sendout: Yes
Performed: Sun-Sat
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Collect: Random urine.
Amount to Collect: 1 mL
Preferred Volume: 1 mL
Minimum Volume: 0.5 mL
Unacceptable Conditions: Specimens exposed to repeated freeze/thaw cycles.
Specimen Preparation: Transfer 1 mL with no additives or preservatives urine to an ARUP Standard Transport Tube. (Min: 0.5 mL)
Additional Processing Instructions: Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 0090362.
Reference Interval: Effective August 17, 2015

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Synonyms:
- Amidone
- Dolophine
- EDDP
- Heptadon
- Methadone
- Methadose
- Pain Management
- Pain Management, Methadone, Quantitative, with medMATCH, Urine
- Pain Management, Methadone, with Confirmation with medMATCH, Urine
- Physeptone
- Symoron

Storage/Transport Temperature: Room temperature.
Stability (from collection to initiation):
  Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Reported:
  1-4 days

CPT Codes:
  80358 (Alt code: G0480)

LOINC:
  • 3774-7
  • 50542-0
# Methadone screen, urine (METHA)

## ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus Chemistry

**Performed:**
- Test available 24 hours per day, 7 days a week.

**Methodology:**
- Homogenous enzyme immunoassay (Beckman DxC 800) using G6PDH labeling

**Additional Information:**
- A concentration of <300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and indicates the presence of methadone. This immunoassay is only a screening test and is not definitive. It is only designed to detect the parent drug, methadone, and NOT the major methadone metabolites (EDDP, EMDP).

- Results cannot be used for medico-legal purposes.

- Positive results will NOT be automatically confirmed. If a confirmation is required, call the laboratory at 415 353 1667 within 7 days of sample collection to request to add-on a methadone confirmation (detects methadone and EDDP, the major metabolite; test code MEDQNT).

## COLLECTION

**Sample Type:**
- Random urine

**Collect:**
- Urine cup

**Amount to Collect:**
- See preferred volume

**Preferred Volume:**
- 1 mL urine

**Minimum Volume:**
- 0.5 mL urine

**Stability (from collection to initiation):**
- Refrigerated for 7 days, frozen at -20°C 1 month.

## PROCESSING

**Test Code:**
- METHA

**Test Group:**
- Methadone

**Performing Lab:**
- Parnassus Chemistry

**Specimen Preparation:**
- Refrigerate sample.

- If methadone confirmation is requested, order Sunquest test code MEDCON (Quest test code 16918). Sample should be transported at room temperature.

**Preferred Volume:**
- 1 mL urine

**Minimum Volume:**
0.5 mL urine

**Stability (from collection to initiation):**
Refrigerated for 7 days, frozen at -20°C 1 month.

### RESULT INTERPRETATION

**Reference Interval:**
Negative

Note: a negative result indicates that methadone is not present, or it is present at a concentration below the cut-off concentration of 300 µg/L.

**Additional Information:**
A concentration of <300 µg/L is considered negative by this test. A positive result is ≥ 300 µg/L and indicates the presence of methadone. This immunoassay is only a screening test and is not definitive. It is only designed to detect the parent drug, methadone, and NOT the major methadone metabolites (EDDP, EMDP).

Results cannot be used for medico-legal purposes.

Positive results will NOT be automatically confirmed. If a confirmation is required, call the laboratory at 415 353 1667 within 7 days of sample collection to request to add-on a methadone confirmation (detects methadone and EDDP, the major metabolite; test code MEDQNT).

### ADMINISTRATIVE

**CPT Codes:**
- 80301

**LOINC Codes:**
- 19550-3

### COMPLETE VIEW

**Available Stat:**
Yes

**Test Code:**
METHA

**Test Group:**
Methadone

**Performing Lab:**
Parnassus Chemistry

**Performed:**
Test available 24 hours per day, 7 days a week.

**Methodology:**
Homogenous enzyme immunoassay (Beckman DxC 800) using G6PDH- labeling

**Collect:**
Urine cup

**Amount to Collect:**
See preferred volume

**Sample Type:**
Random urine

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.5 mL urine

**Specimen Preparation:**
Refrigerate sample.

If methadone confirmation is requested, order Sunquest test code MEDCON (Quest test code 16918). Sample should be transported at
Reference Interval:

Negative

Note: a negative result indicates that methadone is not present, or it is present at a concentration below the cut-off concentration of 300 µg/L.

Stability (from collection to initiation):
Refrigerated for 7 days, frozen at -20°C 1 month.

Additional Information:
A concentration of <300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and indicates the presence of methadone. This immunoassay is only a screening test and is not definitive. It is only designed to detect the parent drug, methadone, and NOT the major methadone metabolites (EDDP, EMDP).

Results cannot be used for medico-legal purposes.

Positive results will NOT be automatically confirmed. If a confirmation is required, call the laboratory at 415 353 1667 within 7 days of sample collection to request to add-on a methadone confirmation (detects methadone and EDDP, the major metabolite; test code MEDQNT).

CPT Codes:
80301

LOINC Codes:
19550-3
Methadone, serum
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
GC/MS
Reported:
Test run Thursday. Turnaround time: 1-8 days.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Methadone
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 16890
Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Collected in Gold top

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:
Therapeutic: 0.05-1.0 mg/L
Toxic: > 1.0 mg/L

**ADMINISTRATIVE**

CPT Codes:
83840-90

**COMPLETE VIEW**

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Test Group:
Methadone

Performing Lab:
Quest

Sendout:
Yes

Methodology:
GC/MS

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3 mL serum

Minimum Volume:
1 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Refrigerate. Order Quest # 16890

Units:
mg/L

Reference Interval:
Therapeutic: 0.05-1.0 mg/L
Toxic: > 1.0 mg/L

Reported:
Test run Thursday. Turnaround time: 1-8 days.

CPT Codes:
83840-90

Test information subject to change
Methaqualone
MQL

ORDERING
Performing Lab: Quest
Methodology: GC/MS
Reported: 7-10 days
Additional Information: Methaqualone was formerly marketed as a sedative and hypnotic; However there is no prescribed dosage form currently available. Abuse potential exists due to euphoric properties.
Synonyms: Quaalude

COLLECTION
Sample Type: Urine
Collect: Urine container
Amount to Collect: 30 mL
Preferred Volume: 30 mL
Minimum Volume: 1.5 mL
Stability (from collection to initiation):
  Room temperature: 5 days
  Refrigerated: 21 days
  Frozen: 1 year

PROCESSING
Test Code: MQL
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze specimen. Transport to CB frozen. Order Quest test code 6197Z.
Preferred Volume: 30 mL
Minimum Volume: 1.5 mL
Stability (from collection to initiation):
  Room temperature: 5 days
  Refrigerated: 21 days
  Frozen: 1 year

RESULT INTERPRETATION
Additional Information:
Methaqualone was formerly marketed as a sedative and hypnotic; however there is no prescribed dosage form currently available. Abuse potential exists due to euphoric properties.

ADMINISTRATIVE

CPT Codes:
80368 - 90 (G0480-90)

LOINC Codes:
3786-1

COMPLETE VIEW

Test Code:
MQL

Performing Lab:
Quest

Sendout:
Yes

Methodology:
GC/MS

Collect:
Urine container

Amount to Collect:
30 mL

Sample Type:
Urine

Preferred Volume:
30 mL

Minimum Volume:
1.5 mL

Specimen Preparation:
Aliquot and freeze specimen. Transport to CB frozen. Order Quest test code 6197Z.

Synonyms:
Quaalude

Stability (from collection to initiation):
Room temperature: 5 days
Refrigerated: 21 days
Frozen: 1 year

Reported:
7-10 days

Additional Information:
Methaqualone was formerly marketed as a sedative and hypnotic; however there is no prescribed dosage form currently available. Abuse potential exists due to euphoric properties.

CPT Codes:
80368 - 90 (G0480-90)

LOINC Codes:
3786-1
Methicillin Resistant Staph aureus Screen
P114

ORDERING

Available Stat:  
No
Performing Lab:  
Microbiology
Performed:  
Daily
Methodology:  
Culture with selective/differential media
Reported:  
24-48 hours
Additional Information:  
Per California law effective 1/1/2009 all patients admitted to UCSF who meet one or more of the following 5 criteria must be screened for MRSA within 24 hours of admission.

Screening Criteria:  
1. Patients previously discharged from an acute care hospital within 30 days of UCSF admission  
2. Patients admitted to an intensive care unit  
3. Patients receiving inpatient dialysis  
4. Patients transferred from skilled nursing facilities

Screening is performed on swabs from the patient's anterior nares only.
Synonyms:  
- MRSA screen  
- Staphylococcus aureus

COLLECTION

Patient Preparation:  
None
Sample Type:  
Anterior nares swab
Collect:  
Swabs in Amies transport media with charcoal
Amount to Collect:  
2 swabs
Preferred Volume:  
2 swabs in Amies transport media
Minimum Volume:  
2 swabs in Amies transport media
Remarks:  
1. Run both swabs quickly under tap water to slightly moisten the swabs.  
2. Using both swabs at the same time, gently insert the swabs approx 1/4 " into the anterior nares (just inside the nasal orofice). Swab in a circular motion; and repeat in second nostril, using the same two (2) swabs.  
3. Place swabs into Amies (charcoal) transport media , cap and deliver per protocol to Microbiology.
Stability (from collection to initiation):  
Room temperature or refrigerated 24 hours.

PROCESSING

Test Code:
P114
Test Group:
   Bacterial culture
Performing Lab:
   Microbiology
Specimen Preparation:
   Refrigerate swab on receipt at China Basin until culture is set up.
Preferred Volume:
   2 swabs in Amies transport media
Minimum Volume:
   2 swabs in Amies transport media
Stability (from collection to initiation):
   Room temperature or refrigerated 24 hours.

RESULT INTERPRETATION

Reference Interval:
   No MRSA isolated
Additional Information:
   Per California law effective 1/1/2009 all patients admitted to UCSF who meet one or more of the following 5 criteria must be screened for MRSA within 24 hours of admission.
   
   Screening Criteria:
   1. Patients previously discharged from an acute care hospital within 30 days of UCSF admission
   2. Patients admitted to an intensive care unit
   3. Patients receiving inpatient dialysis
   4. Patients transferred from skilled nursing facilities

   Screening is performed on swabs from the patient's anterior nares only.

ADMINISTRATIVE

CPT Codes:
   87081
LOINC Codes:
   52969-3

COMPLETE VIEW

Available Stat:
   No
Test Code:
   P114
Test Group:
   Bacterial culture
Performing Lab:
   Microbiology
Performed:
   Daily
Methodology:
   Culture with selective/differential media
Patient Preparation:
   None
Remarks:
   1. Run both swabs quickly under tap water to slightly moisten the swabs.
   2. Using both swabs at the same time, gently insert the swabs approx 1/4 " into the anterior nares (just inside the nasal orofice). Swab in
a circular motion; and repeat in second nostril, using the same two (2) swabs.
3. Place swabs into Amies (charcoal) transport media , cap and deliver per protocol to Microbiology.

Collect:
Swabs in Amies transport media with charcoal

Amount to Collect:
2 swabs

Sample Type:
Anterior nares swab

Preferred Volume:
2 swabs in Amies transport media

Minimum Volume:
2 swabs in Amies transport media

Specimen Preparation:
Refrigerate swab on receipt at China Basin until culture is set up.

Reference Interval:
No MRSA isolated

Synonym:
- MRSA screen
- Staphylococcus aureus

Stability (from collection to initiation):
Room temperature or refrigerated 24 hours.

Reported:
24-48 hours

Additional Information:
Per California law effective 1/1/2009 all patients admitted to UCSF who meet one or more of the following 5 criteria must be screened for MRSA within 24 hours of admission.

Screening Criteria:
1. Patients previously discharged from an acute care hospital within 30 days of UCSF admission
2. Patients admitted to an intensive care unit
3. Patients receiving inpatient dialysis
4. Patients transferred from skilled nursing facilities

Screening is performed on swabs from the patient's anterior nares only.

CPT Codes:
87081

LOINC Codes:
52969-3
Methotrexate
MTX

ORDERING

Approval Required:
Approval is required for testing patients who have received carboxypeptidase rescue therapy.

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
24 hours per day and 7 days per week

Methodology:
Homogeneous Enzyme immunoassay - ARK Diagnostics. Performed on the Beckman DxC 800

Reported:
4 hours

Results on specimens received in the laboratory by 0900 will be available by 1030

Additional Information:
Breakdown products of methotrexate due to Carboxypeptidase rescue therapy are still detected by this assay and therefore continued monitoring of methotrexate in this situation by the in-house assay is problematic. Testing with the in-house assay after carboxypeptidase therapy is only done with approval from a pathologist.

Specimens from patients who have received carboxypeptidase G2 (CPDG2) as a form of emergency methotrexate (MTX) rescue therapy can contain a hydrolysis fragment of MTX designated 4-[[2,4-diamino-6-(pteridinyl)methyl]-methylamino]-benzoic acid (DAMPA) that cross-reacts with the methotrexate antibody used in this immunoassay. Administration of CPDG2 results in a rapid fall in the methotrexate level, however, the magnitude of the fall may be somewhat underestimated by the methotrexate immunoassay due to cross reaction with the DAMPA hydrolysis fragment. 15 minutes after administration of CPDG2, methotrexate levels have been reported to fall by a median of 97% (range 73 - 99%) as judged by methotrexate measurements performed using a specific HPLC assay not subject to the DAMPA interference. In contrast, use of the less specific immunoassay in this circumstance underestimates the fall in methotrexate levels and shows a median decrease of 87% (range 70-99%) (Buchen et al, British Journal of Cancer 92:480, 2005).

Because enzyme immunoassay interference can result in overestimation of serum MTX concentrations immediately after administration of carboxypeptidase enzyme treatment (glucarpidase), it may be helpful to measure MTX after the glucarpidase dosing using a more specific assay (e.g. LC-MS/MS). The LC-MS/MS testing for MTX in these cases can be obtained by sendout to Mayo Medical Laboratories for "Methotrexate Post Glucarpidase, Serum." Refer to the Mayo website for specimen requirements and interpretation of results.

COLLECTION

Sample Type:
Serum or plasma

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum or plasma

Remarks:
Note: Contact laboratory if patient has received Carboxypeptidase rescue therapy

Stability (from collection to initiation):
Refrigerated 1 day, frozen at -20C 1 week

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: MTX
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 0.5 mL serum or plasma
Stability (from collection to initiation): Refrigerated 1 day, frozen at -20°C 1 week

RESULT INTERPRETATION

Units: µmol/L
Reference Interval: Toxic: > 0.1 µmol/L
Additional Information:
Breakdown products of methotrexate due to Carboxypeptidase rescue therapy are still detected by this assay and therefore continued monitoring of methotrexate in this situation by the in-house assay is problematic. Testing with the in-house assay after carboxypeptidase therapy is only done with approval from a pathologist.

Specimens from patients who have received carboxypeptidase G2 (CPDG2) as a form of emergency methotrexate (MTX) rescue therapy can contain a hydrolysis fragment of MTX designated 4-[[2,4-diamino-6-(pteridinyl)methyl]-methylamino]-benzoic acid (DAMPA) that cross-reacts with the methotrexate antibody used in this immunoassay. Administration of CPDG2 results in a rapid fall in the methotrexate level, however, the magnitude of the fall may be somewhat underestimated by the methotrexate immunoassay due to cross reaction with the DAMPA hydrolysis fragment. 15 minutes after administration of CPDG2, methotrexate levels have been reported to fall to a median of 97% (range 73 - 99%) as judged by methotrexate measurements performed using a specific HPLC assay not subject to the DAMPA interference. In contrast, use of the less specific immunoassay in this circumstance underestimates the fall in methotrexate levels and shows a median decrease of 87% (range 70-99%) (Buchen et al, British Journal of Cancer 92:480, 2005).

Because enzyme immunoassay interference can result in overestimation of serum MTX concentrations immediately after administration of carboxypeptidase enzyme treatment (glucarpidase), it may be helpful to measure MTX after the glucarpidase dosing using a more specific assay (e.g. LC-MS/MS). The LC-MS/MS testing for MTX in these cases can be obtained by sendout to Mayo Medical Laboratories for "Methotrexate Post Glucarpidase, Serum." Refer to the Mayo website for specimen requirements and interpretation of results.

ADMINISTRATIVE

CPT Codes: 80299
LOINC Codes: 14836-1

COMPLETE VIEW

Approval Required: Approval is required for testing patients who have received carboxypeptidase rescue therapy.
Available Stat: No
Test Code: MTX
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: 24 hours per day and 7 days per week
Methodology: Homogeneous Enzyme immunoassay - ARK Diagnostics. Performed on the Beckman DxC 800
Remarks:

Note: Contact laboratory if patient has received Carboxypeptidase rescue therapy

Collect:

Gold top or Light Green top

Amount to Collect:

1 mL blood

Sample Type:

Serum or plasma

Preferred Volume:

0.5 mL serum or plasma

Units:

µmol/L

Reference Interval:

Toxic: > 0.1 µmol/L

Stability (from collection to initiation):

Refrigerated 1 day, frozen at -20C 1 week

Reported:

4 hours

Results on specimens received in the laboratory by 0900 will be available by 1030

Additional Information:

Breakdown products of methotrexate due to Carboxypeptidase rescue therapy are still detected by this assay and therefore continued monitoring of methotrexate in this situation by the in-house assay is problematic. Testing with the in-house assay after carboxypeptidase therapy is only done with approval from a pathologist.

Specimens from patients who have received carboxypeptidase G2 (CPDG2) as a form of emergency methotrexate (MTX) rescue therapy can contain a hydrolysis fragment of MTX designated 4-[[2,4-diamino-6-(pteridinyl)methyl]-methylamino]-benzoic acid (DAMPA) that cross-reacts with the methotrexate antibody used in this immunoassay. Administration of CPDG2 results in a rapid fall in the methotrexate level, however, the magnitude of the fall may be somewhat underestimated by the methotrexate immunoassay due to cross reaction with the DAMPA hydrolysis fragment. 15 minutes after administration of CPDG2, methotrexate levels have been reported to fall by a median of 97% (range 73 - 99%) as judged by methotrexate measurements performed using a specific HPLC assay not subject to the DAMPA interference. In contrast, use of the less specific immunoassay in this circumstance underestimates the fall in methotrexate levels and shows a median decrease of 87% (range 70-99%) (Buchen et al, British Journal of Cancer 92:480, 2005).

Because enzyme immunoassay interference can result in overestimation of serum MTX concentrations immediately after administration of carboxypeptidase enzyme treatment (glucarpidase), it may be helpful to measure MTX after the glucarpidase dosing using a more specific assay (e.g. LC-MS/MS). The LC-MS/MS testing for MTX in these cases can be obtained by sendout to Mayo Medical Laboratories for "Methotrexate Post Glucarpidase, Serum." Refer to the Mayo website for specimen requirements and interpretation of results.

CPT Codes:

80299

LOINC Codes:

14836-1
Methylenetetrahydrofolate Reductase (MTHFR) 2 Variants

**ORDERING**

Ordering Recommendations:
Determine genetic contribution to hyperhomocysteinemia for individuals with elevated plasma homocysteine. Not recommended for recurrent pregnancy loss, thrombophilia screening, neural tube defect risk assessment, or testing of family members of individuals with identified MTHFR variants.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Polymerase Chain Reaction and Fluorescence Monitoring

Reported:
2-6 days

Synonyms:
- MTHFR
- MTHFR DNA assay

**COLLECTION**

Sample Type:
Whole blood

Collect:
Lavender (EDTA), pink (K$_2$EDTA), or yellow (ACD Solution A or B).

Amount to Collect:
3 mL

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

**PROCESSING**

Test Code:
MTHFR

ARUP Test Code:
0055655

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Preferred Volume:
Minimum Volume:
1 mL

Unacceptable Conditions:
- Plasma or serum. Heparinized specimens.

Stability (from collection to initiation):
- Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Storage/Transport Temperature:
- Refrigerated.

RESULT INTERPRETATION

Reference Interval:
Negative: Neither of the MTHFR variants tested, c.665C>T (previously designated C677T) and c.1286A>C (previously designated A1298C), were detected. Other causes of elevated homocysteine levels were not evaluated.

Interpretive Data:
Background Information for Methylene
tetrahydrofolate Reductase (MTHFR), 2 Variants:
Characteristics: Variants in the MTHFR gene may reduce enzyme activity contributing to hyperhomocysteinemia. Although hyperhomocysteinemia was previously reported to be a risk factor for many conditions, especially venous thrombosis and cardiovascular disease, recent meta-analysis casts doubt on whether lifelong moderate homocysteine elevation has an effect on cardiovascular disease. The American College of Medical Genetics Practice Guidelines indicate that individuals with elevated homocysteine and two copies of the c.665C>T variant have an odds ratio of 1.27 for venous thromboembolism. Thus, they recommend MTHFR genotyping not be ordered as part of a routine evaluation for recurrent pregnancy loss or thrombophilia due to questionable clinical significance.
Incidence: The allele frequency of the c.665C>T variant is 0.35 in European Caucasians, 0.5 in Hispanics, and 0.12 in African Americans.
Inheritance: Autosomal recessive; two copies of the c.665C>T variant may be a contributing factor to hyperhomocysteinemia.
Variants Tested: c.665C>T(p.Ala222Val) and c.1286A>C(p.Glu429Ala). (legacy names, C677T and A1298C, respectively).
Clinical Sensitivity: Undefined; hyperhomocysteinemia is caused by genetic, physiologic and environmental factors. MTHFR variants are only one contributing factor.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity & Specificity: 99 percent.
Limitations: Only two MTHFR gene variants (c.665C>T and c.1286A>C) are tested. Diagnostic errors can occur due to rare sequence variations.

ADMINISTRATIVE

CPT Codes:
- 81291

LOINC:
- 28005-7
- 28060-2
- 21709-1
- 31208-2

COMPLETE VIEW

Ordering Recommendations:
Determine genetic contribution to hyperhomocysteinemia for individuals with elevated plasma homocysteine. Not recommended for recurrent pregnancy loss, thrombophilia screening, neural tube defect risk assessment, or testing of family members of individuals with identified MTHFR variants.

Test Code:
- MTHFR
ARUP Test Code:
- 0055655
Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Polymerase Chain Reaction and Fluorescence Monitoring

Collect:
Lavender (EDTA), pink (K$_2$EDTA), or yellow (ACD Solution A or B).

Amount to Collect:
3 mL

Sample Type:
Whole blood

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Unacceptable Conditions:
Plasma or serum. Heparinized specimens.

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Reference Interval:
Negative: Neither of the MTHFR variants tested, c.665C>T (previously designated C677T) and c.1286A>C (previously designated A1298C), were detected. Other causes of elevated homocysteine levels were not evaluated.

Interpretive Data:
Background Information for Methylenetetrahydrofolate Reductase (MTHFR), 2 Variants:
Characteristics: Variants in the MTHFR gene may reduce enzyme activity contributing to hyperhomocysteinemia. Although hyperhomocysteinemia was previously reported to be a risk factor for many conditions, especially venous thrombosis and cardiovascular disease, recent meta-analysis casts doubt on whether lifelong moderate homocysteine elevation has an effect on cardiovascular disease. The American College of Medical Genetics Practice Guidelines indicate that individuals with elevated homocysteine and two copies of the c.665C>T variant have an odds ratio of 1.27 for venous thromboembolism. Thus, they recommend MTHFR genotyping not be ordered as part of a routine evaluation for recurrent pregnancy loss or thrombophilia due to questionable clinical significance.
Incidence: The allele frequency of the c.665C>T variant is 0.35 in European Caucasians, 0.5 in Hispanics, and 0.12 in African Americans.
Inheritance: Autosomal recessive; two copies of the c.665C>T variant may be a contributing factor to hyperhomocysteinemia.
Variants Tested: c.665C>T(p.Ala222Val) and c.1286A>C(p.Glu429Ala). (legacy names, C677T and A1298C, respectively).
Clinical Sensitivity: Undefined; hyperhomocysteinemia is caused by genetic, physiologic and environmental factors. MTHFR variants are only one contributing factor.
Methodology: Polymerase chain reaction (PCR) and fluorescence monitoring.
Analytical Sensitivity & Specificity: 99 percent.
Limitations: Only two MTHFR gene variants (c.665C>T and c.1286A>C) are tested. Diagnostic errors can occur due to rare sequence variations.

Synonyms:
- MTHFR
- MTHFR DNA assay

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 2 weeks; Frozen: 1 month

Reported:
2-6 days

CPT Codes:
81291

LOINC:
- 28005-7
• 28060-2
• 21709-1
• 31208-2
Methylmalonic Acid, Serum or Plasma (Vitamin B12 Status)

MMAS

ORDERING

Ordering Recommendations:
Use to evaluate vitamin B12 deficiency in individuals with macrocytic or unexplained anemia, or unexplained neurologic disease. Preferred test is Vitamin B12 with Reflex to Methylmalonic Acid, Serum (Vitamin B12 Status) (0055662).

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-3 days

Synonyms:
- Cobalamin Deficiency (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- Methylmalonate (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- MMA (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- Vitamin B12 Deficiency (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))

COLLECTION

Collect:
Plain red or serum separator tube. Also acceptable: Green (sodium heparin), green (lithium heparin), lavender (EDTA), or pink (K₂EDTA).

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 1 month

Storage/Transport Temperature:
Frozen.

Unacceptable Conditions:
Room temperature specimens. Grossly hemolyzed or lipemic specimens.

PROCESSING

Test Code:
MMAS

ARUP Test Code:
0099431

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Centrifuge and remove serum or plasma from cells within 2 hours of collection. Transfer 1.2 mL serum or plasma to an ARUP Standard Transport Tube and refrigerate or freeze immediately. (Min: 0.6 mL)

Unacceptable Conditions:
Room temperature specimens. Grossly hemolyzed or lipemic specimens.

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 1 month

Storage/Transport Temperature:
Frozen.
RESULT INTERPRETATION

Reference Interval:
0.00-0.40 µmol/L

ADMINISTRATIVE

CPT Codes:
83921

COMPLETE VIEW

Ordering Recommendations:
Use to evaluate vitamin B12 deficiency in individuals with macrocytic or unexplained anemia, or unexplained neurologic disease. Preferred test is Vitamin B12 with Reflex to Methylmalonic Acid, Serum (Vitamin B12 Status) (0055662).

Test Code:
MMAS

ARUP Test Code:
0099431

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Collect:
Plain red or serum separator tube. Also acceptable: Green (sodium heparin), green (lithium heparin), lavender (EDTA), or pink (K2EDTA).

Unacceptable Conditions:
Room temperature specimens. Grossly hemolyzed or lipemic specimens.

Specimen Preparation:
Centrifuge and remove serum or plasma from cells within 2 hours of collection. Transfer 1.2 mL serum or plasma to an ARUP Standard Transport Tube and refrigerate or freeze immediately. (Min: 0.6 mL)

Reference Interval:
0.00-0.40 µmol/L

Synonyms:
- Cobalamin Deficiency (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- Methylmalonate (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- MMA (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))
- Vitamin B12 Deficiency (Methylmalonic Acid, Serum or Plasma (Vitamin B12 Deficiency))

Storage/Transport Temperature:
Frozen.

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 1 month

Reported:
1-3 days

CPT Codes:
83921
Methylmalonic Acid, urine
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Reported:
Test run Monday-Sunday. Turnaround: 2-4 days.

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
5 mL urine
Minimum Volume:
1 mL urine

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
Methylmalonic
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest # 6694
Preferred Volume:
5 mL urine
Minimum Volume:
1 mL urine

RESULT INTERPRETATION

Units:
mmol/mol creatinine
Reference Interval:
<2.1 mmol/mol creatinine

ADMINISTRATIVE

CPT Codes:
82570-90, 83918-90
Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: Methylmalonic
Performing Lab: Quest
Sendout: Yes
Collect: Urine cup
Amount to Collect: See preferred volume
Sample Type: Random urine
Preferred Volume: 5 mL urine
Minimum Volume: 1 mL urine
Specimen Preparation: Refrigerate. Order Quest # 6694
Units: mmol/mol creatinine
Reference Interval: <2.1 mmol/mol creatinine
Reported: Test run Monday-Sunday. Turnaround: 2-4 days.
CPT Codes: 82570-90, 83918-90
Mexiletine
MEXL

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Gas chromatography
Reported:
Test performed Monday, Wednesday, Friday. Turnaround time: 2-5 days.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
MEXL
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum. Order Quest # 4934Z.
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Unacceptable Conditions:
Collected in Gold top

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)
Reference Interval:
Therapeutic: 0.5-2.0 µg/mL
Toxic: >= 1.5 µg/mL
Critical Values:
  Quest Priority-1: \( \geq 5 \mu g/mL \)
  Quest Priority-2: 2.0-4.9 \( \mu g/mL \)

**ADMINISTRATIVE**

CPT Codes:
  80299-90

LOINC Codes:
  3819-0

**COMPLETE VIEW**

Available Stat:
  No

Test Code:
  MEXL

Performing Lab:
  Quest

Sendout:
  Yes

Methodology:
  Gas chromatography

Collect:
  Red top (Gold top **NOT** acceptable)

Amount to Collect:
  4 mL blood

Sample Type:
  Serum

Preferred Volume:
  2 mL serum

Minimum Volume:
  1 mL serum

Unacceptable Conditions:
  Collected in Gold top

Specimen Preparation:
  Refrigerate serum. Order Quest # 4934Z.

Units:
  \( \mu g/mL \) (mcg/mL)

Reference Interval:
  Therapeutic: 0.5-2.0 \( \mu g/mL \)
  Toxic: \( \geq 1.5 \mu g/mL \)

Critical Values:
  Quest Priority-1: \( \geq 5 \mu g/mL \)
  Quest Priority-2: 2.0-4.9 \( \mu g/mL \)

Reported:
  Test performed Monday, Wednesday, Friday. Turnaround time: 2-5 days.

CPT Codes:
  80299-90

LOINC Codes:
  3819-0
MGMT Promoter Methylation Assay

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Perfomed:
Run 1X per week, or as needed
Methodology:
DNA extraction, Bisulfite treatment, PCR and Next Generation DNA sequencing (NGS)
Reported:
2-3 weeks
Additional Information:
The binding of alkyl adducts to the O6 position of guanine cause double stranded DNA breaks and mispairing, resulting in apoptosis and cell death. The MGMT gene is ubiquitously expressed and encodes for a DNA repair protein that removes alkyl adducts from alkylated guanines. This process interferes with the alkylating agent temozolomide, which is used to treat glioblastoma. In some glioblastoma tumors, epigenetic methylation of CpG islands in the MGMT promoter, results in silencing or attenuation of MGMT expression, thus increasing the temozolomide induced-cytotoxicity and portending a better prognosis.

The coupling of MGMT promoter methylation with radiotherapy and alkylating chemotherapy drugs such as carmustine or temozolomide, has been shown to increase mean patient survival. Therefore, the MGMT methylation test is used as a prognostic indicator to treatment with alkylating agents.

This assay is based on bisulfite treatment of genomic DNA recovered from the tumor areas of the submitted slides. Next-Gen DNA sequencing of a 191 bp MGMT promoter region consisting of 17 CpG dinucleotides and spanning Sp1 and other transcription factor binding sites, is used to determine the extent of CpG methylation status in this region. The assay has approximately 2% of methylation detection sensitivity.

The result is reported as "POSITIVE: METHYLATED" if one or more CpG sites are methylated.

Reported values consist of:
1) A methylation index, ranging from 0 to 17 that reflects the number of methylated CpG sites.
2) A methylated fraction, ranging from >0 to 1, that provides an estimation of methylation sites in the analyzed specimen (reported only for positive specimens).
3) An overall methylation score ranging from > 0 to 17 that consists of the multiplication of the methylation index with the methylation fraction (reported only for positive specimens).

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- O6 methylguanine DNA methyltransferase

COLLECTION

Sample Type:
Formalin-fixed, paraffin-embedded 10-micron tissue sections on five (5) unstained, uncharged glass slides. One adjacent H&E stained slide should be included.

Remarks:
1- Tissue sections on slides selected for MGMT methylation analysis must optimally be at least 1 cm2.
2- A pathologist should circle the tumor area of an H&E slide.
3- Five (5) unstained additional slides cut serially and adjacent to the H&E slide must also be submitted.
4- Label slides with pathology case number and block identification.
5- All specimens must be accompanied with a pathology report.

Stability (from collection to initiation):
Formalin-fixed, paraffin-embedded tissues are stable indefinitely at room temperature.
Unacceptable Conditions:
1- Insufficient tumor tissue present on slide as determined by pathologist and/or lab may not yield adequate results and could be reported as QNS.
2- Required number of slides not included.
3- Slides not labeled or not accompanied by completed requisition form (if not ordered directly through Department of Pathology).

PROCESSING

Test Code:
MGMT
Performing Lab:
Medical Genomics - Molecular Diagnostics

Unacceptable Conditions:
1- Insufficient tumor tissue present on slide as determined by pathologist and/or lab may not yield adequate results and could be reported as QNS.
2- Required number of slides not included.
3- Slides not labeled or not accompanied by completed requisition form (if not ordered directly through Department of Pathology).

Stability (from collection to initiation):
Formalin-fixed, paraffin-embedded tissues are stable indefinitely at room temperature

RESULT INTERPRETATION

Reference Interval:
NegativeNo methylationMethylation Index=0

Additional Information:
The binding of alkyl adducts to the O6 position of guanine cause double stranded DNA breaks and mispairing, resulting in apoptosis and cell death. The MGMT gene is ubiquitously expressed and encodes for a DNA repair protein that removes alkyl adducts from alkylated guanines. This process interferes with the alkylating agent temozolomide, which is used to treat glioblastoma. In some glioblastoma tumors, epigenetic methylation of CpG islands in the MGMT promoter, results in silencing or attenuation of MGMT expression, thus increasing the temozolomide induced-cytotoxicity and portending a better prognosis.

The coupling of MGMT promoter methylation with radiotherapy and alkylating chemotherapy drugs such as carmustine or temozolomide, has been shown to increase mean patient survival. Therefore, the MGMT methylation test is used as a prognostic indicator to treatment with alkylating agents.

This assay is based on bisulfite treatment of genomic DNA recovered from the tumor areas of the submitted slides. Next-Gen DNA sequencing of a 191 bp MGMT promoter region consisting of 17 CpG dinucleotides and spanning Sp1 and other transcription factor binding sites, is used to determine the extent of CpG methylation status in this region. The assay has approximately 2% of methylation detection sensitivity.

The result is reported as "POSITIVE: METHYLATED" if one or more CpG sites are methylated.

Reported values consist of:
1) A methylation index, ranging from 0 to 17 that reflects the number of methylated CpG sites.
2) A methylated fraction, ranging from >0 to 1, that provides an estimation of methylation sites in the analyzed specimen (reported only for positive specimens).
3) An overall methylation score ranging from > 0 to 17 that consists of the multiplication of the methylation index with the methylation fraction (reported only for positive specimens).

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

ADMINISTRATIVE

CPT Codes:
81287

LDT or Modified FDA:
Yes
Available Stat:
No

Test Code:
MGMT

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1X per week, or as needed

Methodology:
DNA extraction, Bisulfite treatment, PCR and Next Generation DNA sequencing (NGS)

Remarks:
1- Tissue sections on slides selected for MGMT methylation analysis must optimally be at least 1 cm².
2- A pathologist should circle the tumor area of an H&E slide.
3- Five (5) unstained additional slides cut serially and adjacent to the H&E slide must also be submitted.
4- Label slides with pathology case number and block identification.
5- All specimens must be accompanied with a pathology report.

Sample Type:
Formalin-fixed, paraffin-embedded 10-micron tissue sections on five (5) unstained, uncharged glass slides. One adjacent H&E stained slide should be included.

Unacceptable Conditions:
1- Insufficient tumor tissue present on slide as determined by pathologist and/or lab may not yield adequate results and could be reported as QNS.
2- Required number of slides not included.
3- Slides not labeled or not accompanied by completed requisition form (if not ordered directly through Department of Pathology).

Reference Interval:
Negative No methylation Methylation Index=0

Synonyms:
• O6 methylguanine DNA methyltransferase

Stability (from collection to initiation):
Formalin-fixed, paraffin-embedded tissues are stable indefinitely at room temperature

Reported:
2-3 weeks

Additional Information:
The binding of alkyl adducts to the O6 position of guanine cause double stranded DNA breaks and mispairing, resulting in apoptosis and cell death. The MGMT gene is ubiquitously expressed and encodes for a DNA repair protein that removes alkyl adducts from alkylated guanines. This process interferes with the alkylating agent temozolomide, which is used to treat glioblastoma. In some glioblastoma tumors, epigenetic methylation of CpG islands in the MGMT promoter, results in silencing or attenuation of MGMT expression, thus increasing the temozolomide induced-cytotoxicity and portending a better prognosis.

The coupling of MGMT promoter methylation with radiotherapy and alkylating chemotherapy drugs such as carmustine or temozolomide, has been shown to increase mean patient survival. Therefore, the MGMT methylation test is used as a prognostic indicator to treatment with alkylating agents.

This assay is based on bisulfite treatment of genomic DNA recovered from the tumor areas of the submitted slides. Next-Gen DNA sequencing of a 191 bp MGMT promoter region consisting of 17 CpG dinucleotides and spanning Sp1 and other transcription factor binding sites, is used to determine the extent of CpG methylation status in this region. The assay has approximately 2% of methylation detection sensitivity.

The result is reported as "POSITIVE: METHYLATED" if one or more CpG sites are methylated.

Reported values consist of:
1) A methylation index, ranging from 0 to 17 that reflects the number of methylated CpG sites.
2) A methylated fraction, ranging from >0 to 1, that provides an estimation of methylation sites in the analyzed specimen (reported only for positive specimens).
3) An overall methylation score ranging from > 0 to 17 that consists of the multiplication of the methylation index with the methylation fraction (reported only for positive specimens).

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco.
Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
- 81287

**LDT or Modified FDA:**
- Yes
Mi-2 Antibody

ORDERING

Performing Lab:
Quest
Methodology:
Radioimmunoprecipitation Assay
Reported:
10 - 12 days

COLLECTION

Sample Type:
Serum
Collect:
Red top or Gold top
Amount to Collect:
6 mL
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 2 months.

PROCESSING

Test Code:
MI2
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and ship to China Basin
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 2 months.

RESULT INTERPRETATION

Reference Interval:
Not detected

ADMINISTRATIVE

CPT Codes:
86235-90
Test Code: MI2
Performing Lab: Quest
Sendout: Yes
Methodology: Radioimmunoprecipitation Assay
Collect: Red top or Gold top
Amount to Collect: 6 mL
Sample Type: Serum
Preferred Volume: 3 mL
Minimum Volume: 1 mL
Specimen Preparation: Aliquot and ship to China Basin
Reference Interval: Not detected
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks, frozen 2 months.
Reported: 10 - 12 days
CPT Codes: 86235-90
MICA Antibody Testing
MICAAB (Sunquest: ILMICA)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Luminex-based

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

Reflex Testing:
Yes

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum

Collect:
Red top x2

Amount to Collect:
12 mL blood

Preferred Volume:
6 mL serum

Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
MICAAB (Sunquest: ILMICA)

Test Group:
HLA Antibody Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:  
6 mL serum

Unacceptable Conditions:  
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Stability (from collection to initiation):  
If kept at ambient temperature, can be good for up to 72 hours

RESULT INTERPRETATION

Additional Information:  
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

ADMINISTRATIVE

CPT Codes:  
86833

COMPLETE VIEW

Available Stat:  
Yes

Test Code:  
MICAAB (Sunquest: ILMICA)

Test Group:  
HLA Antibody Testing

Performing Lab:  
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:  
Yes

Methodology:  
Luminex-based

Remarks:  

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:  
Red top x2

Amount to Collect:  
12 mL blood

Sample Type:  
Serum

Preferred Volume:  
6 mL serum

Unacceptable Conditions:  
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

Specimen Preparation:  
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:  
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

Stability (from collection to initiation):  
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring.

This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
Microfilaria Exam
P409M

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Monday-Friday, day shift only
Methodology: Giemsa stain of thick and thin smears
Reported: 1-3 days
Additional Information:
Requires appropriate symptoms including fever, and eosinophilia. Review the patient's history for possible periodicity and optimal time of sampling.

If direct smears are negative, Knott concentration technique is performed and an additional charge is billed. Concentration includes centrifugation of RBC lysates and staining with Giemsa (for nuclear detail) with microscopic speciation.

Also see entries for Onchocerca and for Parasites-Urine.

Synonyms:
- Loa loa
- filaria
- Wucheria

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 3 mL blood
Remarks:
Call Microbiology at x3-1268 to arrange testing. Friday samples should be received by Microbiology by 1230 hours.

Note the exact time of blood draw. Two samples should be drawn, one between 1000 and 1400 hours, the other between 2200 and 0200 hours (arrange outpatient blood draw at night with the Emergency Department).

Stability (from collection to initiation):
Refrigerated 3 days

Unacceptable Conditions:
Improperly collected sample.

PROCESSING

Test Code: P409M
Performing Lab: Microbiology
Specimen Preparation:
Blood specimen may be held until the day shift for making smears.
Unacceptable Conditions:
Improperly collected sample.

Stability (from collection to initiation):
Refrigerated 3 days

RESULT INTERPRETATION

Reference Interval:
Negative

Critical Values:
Filaria identified

Additional Information:
Requires appropriate symptoms including fever, and eosinophilia. Review the patient's history for possible periodicity and optimal time of sampling.

If direct smears are negative, Knott concentration technique is performed and an additional charge is billed. Concentration includes centrifugation of RBC lysates and staining with Giemsa (for nuclear detail) with microscopic speciation.

Also see entries for Onchocerca and for Parasites-Urine.

ADMINISTRATIVE

CPT Codes:
87207

LOINC Codes:
10663-3

COMPLETE VIEW

Available Stat:
No

Test Code:
P409M

Performing Lab:
Microbiology

Performed:
Monday-Friday, day shift only

Methodology:
Giemsa stain of thick and thin smears

Remarks:
Call Microbiology at x3-1268 to arrange testing. Friday samples should be received by Microbiology by 1230 hours.

Note the exact time of blood draw. Two samples should be drawn, one between 1000 and 1400 hours, the other between 2200 and 0200 hours (arrange outpatient blood draw at night with the Emergency Department).

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Unacceptable Conditions:
Improperly collected sample.

Specimen Preparation:
Blood specimen may be held until the day shift for making smears.

Reference Interval:
Negative
Critical Values:
Filiaria identified

Synonyms:
- Loa loa
- filaria
- Wucheria

Stability (from collection to initiation):
Refrigerated 3 days

Reported:
1-3 days

Additional Information:
Requires appropriate symptoms including fever, and eosinophilia. Review the patient's history for possible periodicity and optimal time of sampling.

If direct smears are negative, Knott concentration technique is performed and an additional charge is billed. Concentration includes centrifugation of RBC lysates and staining with Giemsa (for nuclear detail) with microscopic speciation.

Also see entries for Onchocerca and for Parasites-Urine.

CPT Codes:
87207

LOINC Codes:
10663-3
Microsporidia
P414

ORDERING

Available Stat: 
No

Performing Lab: 
Microbiology

Performed: 
Monday-Friday, day shift

Methodology: 
Modified trichrome stain

Reported: 
1-3 days

Additional Information: 
This test should only be ordered if tests for other bacterial and parasitic pathogens are negative. Infection is most common in immunosuppressed (usually HIV-positive) patients with chronic, non-bloody diarrhea, weight loss and epigastric pain.

COLLECTION

Sample Type: 
Body Fluid, Duodenal aspirate, Sputum, Stool, Urine, Eye/Corneal scrapings (submit on clear glass microscope slide)

Collect: 
Inpatients: Clean container
ED/Outpatients: SAF preservative for stool, clean container for other sample types

SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.

Amount to Collect: 
See preferred volume

Preferred Volume: 
10 mL

Note for SAF, fill container to red line on label

Minimum Volume: 
5 mL

Note for SAF, fill container to red line on label

Remarks: 
SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB). Outpatients can obtain these from the laboratories’ draw stations.

Stability (from collection to initiation): 
Unpreserved samples: 24 hours at room temperature, SAF preserved stool: 2 weeks at room temperature

Unacceptable Conditions: 
Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label. More than one sample per week.

PROCESSING

Test Code: 
P414
Performing Lab:
Microbiology

**Specimen Preparation:**
Transfer unpreserved stool to SAF preservative upon receipt in lab.

**Preferred Volume:**
- 10 mL
  
  Note for SAF, fill container to red line on label

**Minimum Volume:**
- 5 mL
  
  Note for SAF, fill container to red line on label

**Unacceptable Conditions:**
- Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label. More than one sample per week.

**Stability (from collection to initiation):**
- Unpreserved samples: 24 hours at room temperature, SAF preserved stool: 2 weeks at room temperature

---

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative

**Additional Information:**
- This test should only be ordered if tests for other bacterial and parasitic pathogens are negative.
- Infection is most common in immunosuppressed (usually HIV-positive) patients with chronic, non-bloody diarrhea, weight loss and epigastric pain.

---

**ADMINISTRATIVE**

**CPT Codes:**
- 87207

**LOINC Codes:**
- 32819-5

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- P414

**Performing Lab:**
- Microbiology

**Performed:**
- Monday-Friday, day shift

**Methodology:**
- Modified trichrome stain

**Remarks:**
- SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB).
- Outpatients can obtain these from the laboratories' draw stations.

**Collect:**
- Inpatients: Clean container
  ED/Outpatients: SAF preservative for stool, clean container for other sample types

**Amount to Collect:**
See preferred volume

**Sample Type:**
- Body Fluid, Duodenal aspirate, Sputum, Stool, Urine, Eye/Corneal scrapings (submit on clear glass microscope slide)

**Preferred Volume:**
- 10 mL
  - Note for SAF, fill container to red line on label

**Minimum Volume:**
- 5 mL
  - Note for SAF, fill container to red line on label

**Unacceptable Conditions:**
- Unpreserved stool received > 1 hour after collection. Stool in a preservative other than SAF. Stool not mixed well in SAF, or if preservative has been poured out. SAF container filled past the red line on the container label. More than one sample per week.

**Specimen Preparation:**
- Transfer unpreserved stool to SAF preservative upon receipt in lab.

**Reference Interval:**
- Negative

**Stability (from collection to initiation):**
- Unpreserved samples: 24 hours at room temperature, SAF preserved stool: 2 weeks at room temperature

**Reported:**
- 1-3 days

**Additional Information:**
- This test should only be ordered if tests for other bacterial and parasitic pathogens are negative.

- Infection is most common in immunosuppressed (usually HIV-positive) patients with chronic, non-bloody diarrhea, weight loss and epigastric pain.

**CPT Codes:**
- 87207

**LOINC Codes:**
- 32819-5

Test information subject to change
# Miscellaneous Toxicology Test

**MTOX**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
</table>

**Additional Information:**

These tests are utilized for specific drug levels, toxicology tests, or other laboratory tests which are of such low frequency that Clinical Labs does not itself perform the analysis. If requested "Stat" the specimen will be dispatched on the next routine pickup if one is scheduled shortly, or by taxi if waiting for a routine pickup would cause excessive delay. Results will be telephoned when available, and will be entered in the computer when we receive the written report. The patient will be charged for any stat transportation costs, and may also be charged an emergency processing fee by the reference laboratory.

## PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>MTOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
</tbody>
</table>

## RESULT INTERPRETATION

**Additional Information:**

These tests are utilized for specific drug levels, toxicology tests, or other laboratory tests which are of such low frequency that Clinical Labs does not itself perform the analysis. If requested "Stat" the specimen will be dispatched on the next routine pickup if one is scheduled shortly, or by taxi if waiting for a routine pickup would cause excessive delay. Results will be telephoned when available, and will be entered in the computer when we receive the written report. The patient will be charged for any stat transportation costs, and may also be charged an emergency processing fee by the reference laboratory.

## COMPLETE VIEW

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>MTOX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Additional Information:**

These tests are utilized for specific drug levels, toxicology tests, or other laboratory tests which are of such low frequency that Clinical Labs does not itself perform the analysis. If requested "Stat" the specimen will be dispatched on the next routine pickup if one is scheduled shortly, or by taxi if waiting for a routine pickup would cause excessive delay. Results will be telephoned when available, and will be entered in the computer when we receive the written report. The patient will be charged for any stat transportation costs, and may also be charged an emergency processing fee by the reference laboratory.
## Mitochondrial Antibody

### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Immunology</td>
</tr>
<tr>
<td>Performed:</td>
<td>Thursday (day shift)</td>
</tr>
<tr>
<td>Methodology:</td>
<td>EIA</td>
</tr>
<tr>
<td>Reported:</td>
<td>2 - 8 days</td>
</tr>
</tbody>
</table>

### COLLECTION

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect:</td>
<td>Gold top</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>1.0 mL blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Unacceptable Conditions:</td>
<td>Grossly hemolyzed, icteric or lipemic serum</td>
</tr>
</tbody>
</table>

### PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>MITOAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Immunology</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Freeze sample at -20°C</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Unacceptable Conditions:</td>
<td>Grossly hemolyzed, icteric or lipemic serum</td>
</tr>
</tbody>
</table>

### RESULT INTERPRETATION

<table>
<thead>
<tr>
<th>Units:</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Interval:</td>
<td></td>
</tr>
<tr>
<td>Negative:</td>
<td>&lt;= 20 Units</td>
</tr>
<tr>
<td>Equivocal:</td>
<td>20.1 - 24.9 Units</td>
</tr>
<tr>
<td>Positive:</td>
<td>&gt;= 25 Units</td>
</tr>
</tbody>
</table>
ADMINISTRATIVE

CPT Codes:
83516

LOINC Codes:
51715-1

COMPLETE VIEW

Available Stat:
No

Test Code:
MITOAB

Performing Lab:
Immunology

Performed:
Thursday (day shift)

Methodology:
EIA

Collect:
Gold top

Amount to Collect:
1.0 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed, icteric or lipemic serum

Specimen Preparation:
Freeze sample at -20°C

Units:
Units

Reference Interval:
Negative: <= 20 Units
Equivocal: 20.1 - 24.9 Units
Positive: >= 25 Units

Reported:
2 - 8 days

CPT Codes:
83516

LOINC Codes:
51715-1
MLL 11q23 FISH
MLLQ23, BMLL

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-situ hybridization (FISH)
Reported: 1-2 weeks
Synonyms:
  - MLLQ23
  - BMLL

COLLECTION

Sample Type: Heparinized whole blood, bone marrow, bone core
Collect:
  - Dark green top (Na-heparin)
Amount to Collect:
  - Bone marrow: 2 mL
  - Blood: 2 mL
  - Bone core: 2 cm
Preferred Volume:
  - Bone marrow: 2 mL
  - Blood: 2 mL
  - Bone core: 2 cm
Minimum Volume:
  - Bone marrow: 1 mL
  - Blood: 1 mL
  - Bone core: 2 cm
Remarks:
  - Maintain sample at room temperature

PROCESSING

Test Code:
  - BMLL: Blood
  - MLLQ23: Bone marrow
Test Group: Oncology FISH
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
  - Maintain sample at room temperature
Preferred Volume:
  - Bone marrow: 2 mL
  - Blood: 2 mL
  - Bone core: 2 cm
Minimum Volume:
  - Bone marrow: 1 mL
RESULT INTERPRETATION

Reference Interval:
No deletion detected

ADMINISTRATIVE

CPT Codes:
88271, 88275
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
BMLL: Blood
MLLQ23: Bone marrow
Test Group:
Oncology FISH
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization (FISH)
Remarks:
Maintain sample at room temperature
Collect:
Dark green top (Na-heparin)
Amount to Collect:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm
Sample Type:
Heparinized whole blood, bone marrow, bone core
Preferred Volume:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm
Minimum Volume:
Bone marrow: 1 mL
Blood: 1 mL
Bone core: 2 cm
Specimen Preparation:
Maintain sample at room temperature
Reference Interval:
No deletion detected
Synonyms:
- MLLQ23
- BMLL
Reported:
1-2 weeks

Printed 06/07/19
Test information subject to change
CPT Codes:
88271, 88275
LDT or Modified FDA:
Yes
mNGS Pathogen Dx
P710

ORDERING

Approval Required:
Yes, testing of UCSF patients requires approval by Microbiology in consultation with Infectious Disease or Neurology. Requests from outside UCSF require an institutional account prior to sample submission.

In select cases, plasma samples may be sent to Karius for testing (see 'Additional Information' below).

Available Stat:
No

Performing Lab:
Microbiology

Methodology:
mNGS

Reported:
1-2 weeks

Additional Information:
Test is interpreted by the Microbiology lab director and discussed with treating physicians as part of the Clinical Microbial Sequencing Board.

See http://nextgendiagnostics.ucsf.edu for additional information.

With approval from the Microbiology lab, plasma samples in select cases may be sent to Karius for testing. Order as "Microbiology - Test Not Listed (Special Sendout Test) (aka P319)."

For Karius collection and processing instructions, click here.

Synonyms:
- Metagenomic next-generation sequencing, deep sequencing

COLLECTION

Sample Type:
CSF

Collect:
CSF tube or sterile black-top tube

Preferred Volume:
2ml

Minimum Volume:
1ml

Remarks:
- Lumbar puncture

Stability (from collection to initiation):
Room temperature 6 hours or refrigerated 6 days, but prefer to freeze within 6 hours; stable frozen at -25 C or -70 C for 1 month

Unacceptable Conditions:
- Samples submitted in incorrect tube, grossly hemolyzed samples

PROCESSING

Test Code:
P710

Performing Lab:
Microbiology

Specimen Preparation:
UCSF: Freeze at -70°C on receipt at China Basin. Other sites: Freeze CSF and ship to China Basin microbiology. Aliquot (if necessary) only under sterile conditions.

Additional Processing Instructions:

With approval from the Microbiology lab, plasma samples in select cases may be sent to Karius for testing. Order as “Microbiology - Test Not Listed (Special Sendout Test) (aka P319).”

For Karius collection and processing instructions, click here.

Preferred Volume:

2ml

Minimum Volume:

1ml

Unacceptable Conditions:

Samples submitted in incorrect tube, grossly hemolyzed samples

Stability (from collection to initiation):

Room temperature 6 hours or refrigerated 6 days, but prefer to freeze within 6 hours; stable frozen at -25 C or -70 C for 1 month

RESULT INTERPRETATION

Reference Interval:

No microorganisms detected

Additional Information:

Test is interpreted by the Microbiology lab director and discussed with treating physicians as part of the Clinical Microbial Sequencing Board.

See http://nextgendiagnostics.ucsf.edu for additional information.

With approval from the Microbiology lab, plasma samples in select cases may be sent to Karius for testing. Order as “Microbiology - Test Not Listed (Special Sendout Test) (aka P319).”

For Karius collection and processing instructions, click here.

ADMINISTRATIVE

CPT Codes:

81479

LDT or Modified FDA:

Yes

COMPLETE VIEW

Approval Required:

Yes, testing of UCSF patients requires approval by Microbiology in consultation with Infectious Disease or Neurology. Requests from outside UCSF require an institutional account prior to sample submission.

In select cases, plasma samples may be sent to Karius for testing (see 'Additional Information' below).

Available Stat:

No

Test Code:

P710

Performing Lab:

Microbiology

Methodology:

mNGS

Remarks:

Lumbar puncture

Collect:

CSF tube or sterile black-top tube
Sample Type:
  CSF

Preferred Volume:
  2ml

Minimum Volume:
  1ml

Unacceptable Conditions:
  Samples submitted in incorrect tube, grossly hemolyzed samples

Specimen Preparation:
  UCSF: Freeze at -70ºC on receipt at China Basin. Other sites: Freeze CSF and ship to China Basin microbiology. Aliquot (if necessary) only under sterile conditions.

Additional Processing Instructions:
  With approval from the Microbiology lab, plasma samples in select cases may be sent to Karius for testing. Order as "Microbiology - Test Not Listed (Special Sendout Test) (aka P319)."

For Karius collection and processing instructions, click here.

Reference Interval:
  No microorganisms detected

Synonyms:
  • Metagenomic next-generation sequencing, deep sequencing

Stability (from collection to initiation):
  Room temperature 6 hours or refrigerated 6 days, but prefer to freeze within 6 hours; stable frozen at -25 C or -70 C for 1 month

Reported:
  1-2 weeks

Additional Information:
  Test is interpreted by the Microbiology lab director and discussed with treating physicians as part of the Clinical Microbial Sequencing Board.

See http://nextgendiagnostics.ucsf.edu for additional information.

With approval from the Microbiology lab, plasma samples in select cases may be sent to Karius for testing. Order as "Microbiology - Test Not Listed (Special Sendout Test) (aka P319)."

For Karius collection and processing instructions, click here.

CPT Codes:
  81479

LDT or Modified FDA:
  Yes
Modified Inhibitor Titer
MODIT

ORDERING

Available Stat:  
No

Performing Lab:  
Parnassus Hematology

Performed:  
Monday-Friday 0800-1400

Methodology:  
Clotting assay (STAGO)

Reported:  
1-5 days

Additional Information:  
Known factor VIII deficient patients may develop antibodies to transfused factor, and thereby develop inhibitors. When there is a clinical indication to screen for inhibitors in factor deficient patients or there is clinical suspicion for inhibitor development, a modified inhibitor titer may be performed rather than a factor inhibitor screen (mixing study). The modified inhibitor titer can detect inhibitors as low as 0.25 Bethesda Units (BU).

Because the modified inhibitor titer has a 2 hour incubation step, slow acting inhibitors may be detected. An in house UCSF study in the Fall of 2008 indicated that the modified inhibitor titer can detect low titer inhibitors missed by the factor inhibitor screen. This study also showed that the modified inhibitor screen can yield a result of <0.25 BU in patients for whom the factor inhibitor screen gave an equivocal result.

If a Factor VIII level has not been performed within the preceding 24 hours one will be automatically ordered and charged for before the inhibitor titer is performed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- FVIII titer
- Factor 8 specific mini titer

COLLECTION

Patient Preparation:  
Deliver samples to Hematology for processing. Freeze platelet poor plasma at -20C

Sample Type:  
Citrated plasma

Collect:  
2.7 mL Blue top filled to full extent of vacuum x 2

Amount to Collect:  
5.4 mL blood

Preferred Volume:  
2 mL plasma

Minimum Volume:  
1 mL plasma

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct’s >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in
order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):  
4 hours

Unacceptable Conditions:  
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code: MODIT
Test Group: Factor Inhibitor titer
Performing Lab: Parnassus Hematology
Preferred Volume: 2 mL plasma
Minimum Volume: 1 mL plasma
Unacceptable Conditions:  
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Stability (from collection to initiation):  
4 hours

RESULT INTERPRETATION

Units: Bethesda Units (BU)
Reference Interval: <0.25 BU
Additional Information: Known factor VIII deficient patients may develop antibodies to transfused factor, and thereby develop inhibitors. When there is a clinical indication to screen for inhibitors in factor deficient patients or there is clinical suspicion for inhibitor development, a modified inhibitor titer may be performed rather than a factor inhibitor screen (mixing study). The modified inhibitor titer can detect inhibitors as low as 0.25 Bethesda Units (BU).

Because the modified inhibitor titer has a 2 hour incubation step, slow acting inhibitors may be detected. An in house UCSF study in the Fall of 2008 indicated that the modified inhibitor titer can detect low titer inhibitors missed by the factor inhibitor screen. This study also showed that the modified inhibitor screen can yield a result of <0.25 BU in patients for whom the factor inhibitor screen gave an equivocal result.

If a Factor VIII level has not been performed within the preceding 24 hours one will be automatically ordered and charged for before the inhibitor titer is performed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes: 85335
LDT or Modified FDA: Yes
LOINC Codes: 3206-0

COMPLETE VIEW
Available Stat: No

Test Code: MODIT

Test Group: Factor Inhibitor titer

Performing Lab: Parnassus Hematology

Performed: Monday-Friday 0800-1400

Methodology: Clotting assay (STAGO)

Patient Preparation: Deliver samples to Hematology for processing. Freeze platelet poor plasma at -20C

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect: 2.7 mL Blue top filled to full extent of vacuum x 2

Amount to Collect: 5.4 mL blood

Sample Type: Citrated plasma

Preferred Volume: 2 mL plasma

Minimum Volume: 1 mL plasma

Unacceptable Conditions: Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Units: Bethesda Units (BU)

Reference Interval: <0.25 BU

Synonyms:
• FVIII titer
• Factor 8 specific mini titer

Stability (from collection to initiation): 4 hours

Reported: 1-5 days

Additional Information:

Known factor VIII deficient patients may develop antibodies to transfused factor, and thereby develop inhibitors. When there is a clinical indication to screen for inhibitors in factor deficient patients or there is clinical suspicion for inhibitor development, a modified inhibitor titer may be performed rather than a factor inhibitor screen (mixing study). The modified inhibitor titer can detect inhibitors as low as 0.25 Bethesda Units (BU).

Because the modified inhibitor titer has a 2 hour incubation step, slow acting inhibitors may be detected. An in house UCSF study in the Fall of 2008 indicated that the modified inhibitor titer can detect low titer inhibitors missed by the factor inhibitor screen. This study also showed that the modified inhibitor screen can yield a result of <0.25 BU in patients for whom the factor inhibitor screen gave an equivocal result.
If a Factor VIII level has not been performed within the preceding 24 hours one will be automatically ordered and charged for before the inhibitor titer is performed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85335

LDT or Modified FDA:
Yes

LOINC Codes:
3206-0
MOG Antibody, IgG

ORDERING

Available Stat: No
Performing Lab: Mayo
Methodology: Fluorescence-Activated Cell Sorting Assay
Reported: 5-7 days

Additional Information:

USEFUL FOR:
- Diagnosis of inflammatory demyelinating diseases (IDD) with similar phenotype to neuromyelitis optica spectrum disorder (NMOSD), including optic neuritis (single or bilateral) and transverse myelitis
- Diagnosis of autoimmune myelin oligodendrocyte glycoprotein (MOG)-opathy
- Diagnosis of neuromyelitis optica (NMO)
- Distinguishing NMOSD, acute disseminated encephalomyelitis (ADEM), optic neuritis, and transverse myelitis from multiple sclerosis early in the course of disease
- Diagnosis of ADEM
- Prediction of a relapsing disease course

Reflex Testing:
Yes, if positive titer test will be performed at an additional charge.

Synonyms:
- Myelin Oligodendrocyte Glycoprotein

COLLECTION

Sample Type: Serum
Collect:
- Red-top or Gold-top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

Stability (from collection to initiation):
- Ambient: 72 hours
- Refrigerated/Frozen: 28 days

PROCESSING

Test Code: MOGFS
Sendout:
Yes
Performing Lab:
Mayo

Specimen Preparation:
Aliquot serum and freeze. Transport to CB frozen. Order Mayo test code MOGFS.

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

Stability (from collection to initiation):
Ambient: 72 hours
Refrigerated/Frozen: 28 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
USEFUL FOR:

Diagnosis of inflammatory demyelinating diseases (IDD) with similar phenotype to neuromyelitis optica spectrum disorder (NMOSD), including optic neuritis (single or bilateral) and transverse myelitis

Diagnosis of autoimmune myelin oligodendrocyte glycoprotein (MOG)-opathy

Diagnosis of neuromyelitis optica (NMO)

Distinguishing NMOSD, acute disseminated encephalomyelitis (ADEM), optic neuritis, and transverse myelitis from multiple sclerosis early in the course of disease

Diagnosis of ADEM

Prediction of a relapsing disease course

ADMINISTRATIVE

CPT Codes:
86255

COMPLETE VIEW

Available Stat:
No

Test Code:
MOGFS

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Fluorescence-Activated Cell Sorting Assay

Collect:
Red-top or Gold-top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

**Minimum Volume:**
1 mL serum

**Specimen Preparation:**
Aliquot serum and freeze. Transport to CB frozen. Order Mayo test code MOGFS.

**Reference Interval:**
Negative

**Synonyms:**
- Myelin Oligodendrocyte Glycoprotein

**Stability (from collection to initiation):**
- Ambient: 72 hours
- Refrigerated/Frozen: 28 days

**Reported:**
5-7 days

**Reflex Testing:**
Yes, if positive titer test will be performed at an additional charge.

**Additional Information:**
USEFUL FOR:
- Diagnosis of inflammatory demyelinating diseases (IDD) with similar phenotype to neuromyelitis optica spectrum disorder (NMOSD), including optic neuritis (single or bilateral) and transverse myelitis
- Diagnosis of autoimmune myelin oligodendrocyte glycoprotein (MOG)-opathy
- Diagnosis of neuromyelitis optica (NMO)
- Distinguishing NMOSD, acute disseminated encephalomyelitis (ADEM), optic neuritis, and transverse myelitis from multiple sclerosis early in the course of disease
- Diagnosis of ADEM
- Prediction of a relapsing disease course

**CPT Codes:**
86255
Molybdenum, blood
MOLY

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Inductively couple plasma mass spectroscopy
Reported: 2-3 weeks
Additional Information:
Molybdenum is an essential trace element. In anemia, molybdenum concentration decreases in both erythrocytes and plasma. Toxic doses can cause anemia and abnormal copper metabolism.
Synonyms:
• Mb

COLLECTION

Patient Preparation:
Patient should refrain from taking mineral supplements 3 days before specimen collection and from eating legumes and leafy vegetables 2 days before specimen collection.
Sample Type:
EDTA whole blood
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
4 mL blood
Preferred Volume:
4 mL blood
Minimum Volume:
2 mL blood
Stability (from collection to initiation):
Room temperature 48 hours, refrigerated 5 days.
Unacceptable Conditions:
Hemolyzed, clotted
Rejection Criteria:
Received frozen or room temp

PROCESSING

Test Code: MOLY
Test Group: Molybdenum
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Store whole blood in original collection tube or POUR whole blood into a plastic trace element shipping container (lavender label). Ship refrigerated. Order Quest # 56960P
Preferred Volume:
  4 mL blood
Minimum Volume:
  2 mL blood
Unacceptable Conditions:
  Hemolyzed, clotted
Rejection Criteria:
  Received frozen or room temp
Stability (from collection to initiation):
  Room temperature 48 hours, refrigerated 5 days.

RESULT INTERPRETATION

Units:
  µg/L (mcg/L)
Reference Interval:
  <2.1 µg/L
Additional Information:
  Molybdenum is an essential trace element. In anemia, molybdenum concentration decreases in both erythrocytes and plasma. Toxic doses can cause anemia and abnormal copper metabolism.

ADMINISTRATIVE

CPT Codes:
  83018-90
LOINC Codes:
  5696-0

COMPLETE VIEW

Available Stat:
  No
Test Code:
  MOLY
Test Group:
  Molybdenum
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Inductively couple plasma mass spectroscopy
Patient Preparation:
  Patient should refrain from taking mineral supplements 3 days before specimen collection and from eating legumes and leafy vegetables 2 days before specimen collection.
Collect:
  Navy blue top (EDTA) tube
Amount to Collect:
  4 mL blood
Sample Type:
  EDTA whole blood
Preferred Volume:
  4 mL blood
Minimum Volume:
  2 mL blood
Rejection Criteria:
  Received frozen or room temp

Unacceptable Conditions:
  Hemolyzed, clotted

Specimen Preparation:
  Store whole blood in original collection tube or POUR whole blood into a plastic trace element shipping container (lavender label). Ship refrigerated. Order Quest # 56960P

Units:
  µg/L (mcg/L)

Reference Interval:
  <2.1 µg/L

Synonyms:
  • Mb

Stability (from collection to initiation):
  Room temperature 48 hours, refrigerated 5 days.

Reported:
  2-3 weeks

Additional Information:
  Molybdenum is an essential trace element. In anemia, molybdenum concentration decreases in both erythrocytes and plasma. Toxic doses can cause anemia and abnormal copper metabolism.

CPT Codes:
  83018-90

LOINC Codes:
  5696-0
Monosomy 5 / Del5q FISH
M5D5Q, BM5D5Q

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization
Synonyms:
• 5q-
• -5
• M5D5Q
• BM5D5Q

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable
Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm
Preferred Volume:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm
Minimum Volume:
Bone marrow: 1 mL
Blood: 1 mL
Bone core: 2 cm

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
BM5D5Q: Blood
M5D5Q: Bone marrow
Test Group:
FISH
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours
Preferred Volume:
Bone marrow: 2 mL
Blood: 2 mL  
?Bone core: 2 cm  

**Minimum Volume:**  
Bone marrow: 1 mL  
Blood: 1 mL  
?Bone core: 2 cm  

**Unacceptable Conditions:**  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

### RESULT INTERPRETATION

**Reference Interval:**  
Not detected

### ADMINISTRATIVE

**CPT Codes:**  
88275, 88271

**LDT or Modified FDA:**  
Yes

### COMPLETE VIEW

**Available Stat:**  
No  

**Test Code:**  
BM5D5Q: Blood  
M5D5Q: Bone marrow  

**Test Group:**  
FISH

**Performing Lab:**  
Medical Genomics - Cytogenetics

**Methodology:**  
Fluorescent in-situ hybridization

**Collect:**  
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

**Amount to Collect:**  
Bone marrow: 2 mL  
Blood: 2 mL  
Bone core: 2 cm

**Sample Type:**  
Heparinized whole blood, bone marrow, bone core

**Preferred Volume:**  
Bone marrow: 2 mL  
Blood: 2 mL  
?Bone core: 2 cm

**Minimum Volume:**  
Bone marrow: 1 mL  
Blood: 1 mL  
?Bone core: 2 cm

**Unacceptable Conditions:**  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Specimen Preparation:**
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

**Reference Interval:**
Not detected

**Synonyms:**
- 5q-
- -5
- M5D5Q
- BM5D5Q

**CPT Codes:**
88275, 88271

**LDT or Modified FDA:**
Yes
Monosomy 7 / Deletion 7q FISH
M7D7Q, BM7D7Q

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization
Reported:
7-14 days
Synonyms:
- -7
- Del 7q
- M7D7Q
- BM7D7Q

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable.
Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm

Preferred Volume:
Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm

Minimum Volume:
Bone marrow: 1 mL
Blood: 1 mL
Bone core: 2 cm

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
BM7D7Q: Blood
M7D7Q: Bone marrow
Test Group:
FISH
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 2 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
- 48 hours

RESULT INTERPRETATION

Reference Interval:
- Not detected

ADMINISTRATIVE

CPT Codes:
- 88275, 88271x2

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BM7D7Q: Blood
- M7D7Q: Bone marrow

Test Group:
- FISH

Performing Lab:
- Medical Genomics - Cytogenetics

Methodology:
- Fluorescent in-situ hybridization

Collect:
- Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable.

- Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

Sample Type:
- Heparinized whole blood, bone marrow, bone core

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm
Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 2 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:
- Not detected

Synonyms:
- -7
- Del 7q
- M7D7Q
- BM7D7Q

Stability (from collection to initiation):
- 48 hours

Reported:
- 7-14 days

CPT Codes:
- 88275, 88271x2

LDT or Modified FDA:
- Yes
Mucopolysaccharide Enzyme Analysis
MOLT

ORDERING

Ordering Recommendations:
This confirmatory testing is primarily ordered in patients who have been demonstrated to have elevated levels of mucopolysaccharides (glycosaminoglycans, GAG's) in urine. Alternatively it may be ordered in a patient where the diagnosis of a Mucopolysaccharidosis is highly suspect but the urine testing is negative.

Available Stat:
No

Performing Lab:
JMC

Reported:
Test run Thursdays. Turnaround time: 8-10 days.

Additional Information:
Additional assays for confirmatory testing may be run and charged separately.

Synonyms:
- Mucoploysacharidoses
- Mucopolysaccharidosis
- Hunter
- Hurler
- Sanfilippo
- Morquio
- Maroteaux-Lamy
- Sly
- hyaluronidase deficiency
- MPS type I
- MPS type II
- MPS type III
- MPS type IV
- MPS type VI
- MPS Type VII
- MPS type IX
- Glycosaminoglycans
- GAG's
- Mucolipidoses
- Mucolipidosis

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Dark Green top

Amount to Collect:
10 mL blood

Preferred Volume:
10 mL blood
Minimum Volume:
4 mL blood

Remarks:
A detailed clinical history must accompany the test request. Sample must arrive at performing laboratory within 24 hours of collection therefore collect Monday through Thursday noon only.

Keep sample at room temperature during storage and transport to the laboratory.

Unacceptable Conditions:
Samples collected outside of stated time frames

PROCESSING

Test Code:  
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Sendout:  
Yes

Performing Lab:  
JMC

Specimen Preparation:  
Keep at room temperature-do NOT centrifuge or refrigerate.

Ship with clinical history by Federal Express, Monday-Thursday only, to:

Dr. David A. Wenger  
Lysosomal Diseases Testing Laboratory  
Jefferson Alumni Hall, Rm. 394  
1020 Locust St.  
Philadelphia, PA 19107  
ph: (215)955-4923, fax 955-9554, email: david.wenger@mail.tju.edu

Preferred Volume:  
10 mL blood

Minimum Volume:  
4 mL blood

Unacceptable Conditions:  
Samples collected outside of stated time frames

RESULT INTERPRETATION

Additional Information:
Additional assays for confirmatory testing may be run and charged separately.

ADMINISTRATIVE

CPT Codes:  
84311-90 x6

COMPLETE VIEW

Available Stat:  
No

Ordering Recommendations:
This confirmatory testing is primarily ordered in patients who have been demonstrated to have elevated levels of mucopolysaccharides (glycosaminoglycans, GAG's) in urine. Alternatively it may be ordered in a patient where the diagnosis of a Mucopolysaccharidosis is highly suspect but the urine testing is negative.

Test Code:  
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Performing Lab:
JMC
Sendout:
Yes
Remarks:
A detailed clinical history must accompany the test request. Sample must arrive at performing laboratory within 24 hours of collection therefore collect Monday through Thursday noon only.

Keep sample at room temperature during storage and transport to the laboratory.
Collect:
Dark Green top
Amount to Collect:
10 mL blood
Sample Type:
Heparinized whole blood
Preferred Volume:
10 mL blood
Minimum Volume:
4 mL blood
Unacceptable Conditions:
Samples collected outside of stated time frames
Specimen Preparation:
Keep at room temperature-do NOT centrifuge or refrigerate.
Ship with clinical history by Federal Express, Monday-Thursday only, to:

Dr. David A. Wenger
Lysosomal Diseases Testing Laboratory
Jefferson Alumni Hall, Rm. 394
1020 Locust St.
Philadelphia, PA 19107
ph: (215)955-4923, fax 955-9554, email: david.wenger@mail.tju.edu

Synonyms:
- Mucopolysacharidoses
- Mucopolysaccharidosis
- Hunter
- Hurler
- Sanfilippo
- Morquio
- Maroteaux-Lamy
- Sly
- hyaluronidase deficiency
- MPS type I
- MPS type II
- MPS type III
- MPS type IV
- MPS type VI
- MPS Type VII
- MPS type IX
- Glycosaminoglycans
- GAG's
- Mucolipidoses
- Mucolipidosis

**Reported:**
- Test run Thursdays. Turnaround time: 8-10 days.

**Additional Information:**
- Additional assays for confirmatory testing may be run and charged separately.

**CPT Codes:**
- 84311-90 x6
Mucopolysaccharides, urine by TLC
MPSTLC

ORDERING

Ordering Recommendations:
This test should be ordered in conjunction with the quantitative assay (MPSQNT) when establishing or confirming a diagnosis of mucopolysaccharidoses.

Once the diagnosis and type of mucopolysaccharidoses is established in a given patient monitoring typically only requires the quantitative assay be performed.

Available Stat:
No

Performing Lab:
Stanford Hospital Clinical Laboratory

Methodology:
Thin layer chromatography

Reported:
Turnaround time 5-7 days

Synonyms:
- Mucopolysaccharidoses
- Mucopolysaccharidosis
- Hunter
- Hurler
- Sanfilippo
- Morquio
- Maroteaux-Lamy
- Sly
- hyaluronidase deficiency
- MPS type I
- MPS type II
- MPS type III
- MPS type IV
- MPS type VI
- MPS Type VII
- MPS type IX
- Glycosaminoglycans
- GAG’s
- Mucolipidoses
- Mucolipidosis

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
15 mL urine
Preferred Volume:
15 mL urine

Minimum Volume:
10 mL urine

Remarks:
Transport immediately to lab for processing

Unacceptable Conditions:
Sample received > 2 hours after collection

Rejection Criteria:
Sample received thawed

PROCESSING

Test Code:
MPSTLC

Test Group:
Mucopolysaccharides

Sendout:
Yes

Performing Lab:
Stanford Hospital Clinical Laboratory

Specimen Preparation:
Freeze urine immediately at -20C and transport frozen.

Preferred Volume:
15 mL urine

Minimum Volume:
10 mL urine

Unacceptable Conditions:
Sample received > 2 hours after collection

Rejection Criteria:
Sample received thawed

ADMINISTRATIVE

CPT Codes:
84375-90

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
This test should be ordered in conjunction with the quantitative assay (MPSQNT) when establishing or confirming a diagnosis of mucopolysaccharidosis.

Once the diagnosis and type of mucopolysaccharidosis is established in a given patient monitoring typically only requires the quantitative assay be performed.

Test Code:
MPSTLC

Test Group:
Mucopolysaccharides

Performing Lab:
Stanford Hospital Clinical Laboratory

Sendout:
Yes
Methodology:
   Thin layer chromatography

Remarks:
   Transport immediately to lab for processing

Collect:
   Urine cup

Amount to Collect:
   15 mL urine

Sample Type:
   Random urine

Preferred Volume:
   15 mL urine

Minimum Volume:
   10 mL urine

Rejection Criteria:
   Sample received thawed

Unacceptable Conditions:
   Sample received > 2 hours after collection

Specimen Preparation:
   Freeze urine immediately at -20C and transport frozen.

Synonyms:
   - Mucopolysacharidoses
   - Mucopolysaccharidosis
   - Hunter
   - Hurler
   - Sanfilippo
   - Morquio
   - Maroteaux-Lamy
   - Sly
   - hyaluronidase deficiency
   - MPS type I
   - MPS type II
   - MPS type III
   - MPS type IV
   - MPS type VI
   - MPS Type VII
   - MPS type IX
   - Glycosaminoglycans
   - GAG's
   - Mucolipidoses
   - Mucolipidosis

Reported:
   Turnaround time 5-7 days

CPT Codes:
   84375-90
Mucopolysaccharides, urine Quantitation
MPSQNT

ORDERING

Ordering Recommendations:
This test should be ordered in conjunction with the TLC assay (MPSTLC) when establishing or confirming a diagnosis of mucopolysaccharidoses.

Once the diagnosis and type of mucopolysaccharidoses is established in a given patient monitoring typically only requires the quantitative assay be performed.

Available Stat:
No

Performing Lab:
Stanford Hospital Clinical Laboratory

Methodology:
Spectrophotometry

Synonyms:
- Mucopolysacharidoses
- Mucopolysacharidosis
- Hunter
- Hurler
- Sanfilippo
- Morquio
- Maroteaux-Lamy
- Sly
- hyaluronidase deficiency
- MPS type I
- MPS type II
- MPS type III
- MPS type IV
- MPS type VI
- MPS Type VII
- MPS type IX
- Glycosaminoglycans
- GAG's
- Mucolipidoses
- Mucolipidosis

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
10 mL urine

Preferred Volume:
2 mL urine
Minimum Volume:
2 mL urine

Remarks:
Transport immediately to lab for processing

Unacceptable Conditions:
Sample received > 2 hours after collection

Rejection Criteria:
Sample received thawed

PROCESSING

Test Code:
MPSQNT

Test Group:
Mucopolysaccharides

Sendout:
Yes

Performing Lab:
Stanford Hospital Clinical Laboratory

Specimen Preparation:
Freeze urine immediately at -20C and transport frozen.

Preferred Volume:
2 mL urine

Minimum Volume:
2 mL urine

Unacceptable Conditions:
Sample received > 2 hours after collection

Rejection Criteria:
Sample received thawed

RESULT INTERPRETATION

Units:
mg/mmol creatinine

Reference Interval:
<48 mg/mmol creatinine

ADMINISTRATIVE

CPT Codes:
83864-90

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
This test should be ordered in conjunction with the TLC assay (MPSTLC) when establishing or confirming a diagnosis of mucoplysacharidoses.

Once the diagnosis and type of mucoplysacharidoses is established in a given patient monitoring typically only requires the quantitative assay be performed.

Test Code:
MPSQNT

Test Group:
Mucopolysaccharides

**Performing Lab:**
Stanford Hospital Clinical Laboratory

**Sendout:**
Yes

**Methodology:**
Spectrophotometry

**Remarks:**
Transport immediately to lab for processing

**Collect:**
Urine cup

**Amount to Collect:**
10 mL urine

**Sample Type:**
Random urine

**Preferred Volume:**
2 mL urine

**Minimum Volume:**
2 mL urine

**Rejection Criteria:**
Sample received thawed

**Unacceptable Conditions:**
Sample received > 2 hours after collection

**Specimen Preparation:**
Freeze urine immediately at -20C and transport frozen.

**Units:**
mg/mmol creatinine

**Reference Interval:**
<48 mg/mmol creatinine

**Synonyms:**
- Mucoploysacharidoses
- Mucopolysacharidosis
- Hunter
- Hurler
- Sanfilippo
- Morquio
- Maroteaux-Lamy
- Sly
- hyaluronidase deficiency
- MPS type I
- MPS type II
- MPS type III
- MPS type IV
- MPS type VI
- MPS Type VII
- MPS type IX
- Glycosaminoglycans
- GAG’s
- Mucolipidoses
- Mucolipidosis
CPT Codes:
83864-90
Multiple Myeloma FISH Panel
CYMM, BCYMM

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Monday - Friday day shift
Methodology:
Fluorescence in situ Hybridization (FISH)
Reported:
1-2 weeks
Additional Information:
Includes FISH probes for the following markers: Duplication 1q, Translocation 4:14, Translocation 11:14, Deletion 13q, Translocation 14:16, Deletion 17p.

The individual FISH markers are orderable separately.

Synonyms:
- DUP1Q
- TR414
- TR1114
- DEL13Q
- TR1416
- DEL17P
- Duplication 1q
- Translocation 4:14
- Translocation 11:14
- Deletion 13q
- Translocation 14:16
- Deletion 17p
- plasma cell dyscrasia
- monoclonal gammopathy
- CYMM
- BCYMM

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core
Collect:
Dark green top
Amount to Collect:
See preferred volume
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

**Remarks:**
Transport samples at room temperature

**Stability (from collection to initiation):**
Room temperature 2 days

**Unacceptable Conditions:**
Frozen, cracked or mislabeled containers

---

### PROCESSING

**Test Code:**
- BCYMM: Blood
- CYMM: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Specimen Preparation:**
Do not centrifuge, store at room temperature. Transport samples to Cytogenetics as soon as possible.

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Frozen, cracked or mislabeled containers

**Stability (from collection to initiation):**
Room temperature 2 days

---

### RESULT INTERPRETATION

**Additional Information:**
Includes FISH probes for the following markers: Duplication 1q, Translocation 4:14, Translocation 11:14, Deletion 13q, Translocation 14:16, Deletion 17p.

The individual FISH markers are orderable separately.

---

### ADMINISTRATIVE

**CPT Codes:**
88271 x12, 88275 x6

**LDT or Modified FDA:**
Yes

---

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
- BCYMM: Blood
- CYMM: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics
Performed:
Monday - Friday day shift

Methodology:
Fluorescence in situ Hybridization (FISH)

Remarks:
Transport samples at room temperature

Collect:
Dark green top

Amount to Collect:
See preferred volume

Sample Type:
Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

Specimen Preparation:
Do not centrifuge, store a room temperature. Transport samples to Cytogenetics as soon as possible.

Synonyms:
- DUP1Q
- TR414
- TR1114
-DEL13Q
-TR1416
-DEL17P
- Duplication 1q
- Translocation 4:14
- Translocation 11:14
- Deletion 13q
- Translocation 14:16
- Deletion 17p
- plasma cell dyscrasia
- monoclonal gammopathy
- CYMM
- BCYMM

Stability (from collection to initiation):
Room temperature 2 days

Reported:
1-2 weeks

Additional Information:
Includes FISH probes for the following markers: Duplication 1q, Translocation 4:14, Translocation 11:14, Deletion 13q, Translocation 14:16, Deletion 17p.
The individual FISH markers are orderable separately.

CPT Codes:
88271 x12, 88275 x6
LDT or Modified FDA:
Yes
Multiple Myeloma MRD, Flow
MRDMM

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Flow cytometric immunophenotyping
Reported:
2 - 4 days
Additional Information:
High-sensitivity flow cytometry test for detection of minimal residual myeloma cells, post treatment

Adopted EuroFlow guidelines and Cytognos software

Sensitivity of 10(-5) or better, depending on the antigenic profile of abnormal plasma cells

Clinical Information

Multiple myeloma is an incurable malignant neoplasm of plasma cells. One of the best prognostic factors in multiple myeloma is the level of minimal residual disease post chemotherapy or autologous stem cell transplantation. The greater depth of the response (less malignant cells present), the longer time to progression and overall survival.(1)

Useful For

Detection of low level (minimal residual disease) myeloma cells after therapy

Interpretation

The interpretation of the test is done by an evaluating automated and manually gated populations to isolate abnormal plasma cells. If there is an abnormal plasma cell population (cluster of 20 cells or more), then the result is minimal residual disease (MRD)-positive, with the percentage of abnormal plasma cells out of total analyzed events. If no abnormal population is found, then the result will be interpreted as MRD-negative.

Cautions

There are situations in which current gating strategies are insufficient to identify abnormal plasma cells. This can occur if the abnormal plasma cells do not phenotypically differ from normal plasma cells. In addition, in patients who have undergone therapeutic antibody treatment (anti-CD38, for example), decreased antigen expression on plasma cells may interfere with the gating strategy.

Clinical Reference


Synonyms:

- Euroflow MRD
COLLECTION

Sample Type:
Bone marrow

Collect:
Lavender top, ACD

Amount to Collect:
See Preferred volume

Preferred Volume:
4 mL

Minimum Volume:
2 mL

Stability (from collection to initiation):
72 hours

PROCESSING

Test Code:
MRDMM

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Do not aliquot sample. Transport to CB ambient. Order Mayo test code MRDMM.

Preferred Volume:
4 mL

Minimum Volume:
2 mL

Stability (from collection to initiation):
72 hours

RESULT INTERPRETATION

Reference Interval:
An interpretive report will be provided.

This test will be processed as a laboratory consultation. An interpretation of the immunophenotypic findings and correlation with the previous patient history will be provided by a hematopathologist for every case.

Additional Information:
High-sensitivity flow cytometry test for detection of minimal residual myeloma cells, post treatment

Adopted EuroFlow guidelines and Cytognos software

Sensitivity of 10^{-5} or better, depending on the antigenic profile of abnormal plasma cells

Clinical Information
Multiple myeloma is an incurable malignant neoplasm of plasma cells. One of the best prognostic factors in multiple myeloma is the level of minimal residual disease post chemotherapy or autologous stem cell transplantation. The greater depth of the response (less malignant cells present), the longer time to progression and overall survival.(1)

Useful For
Detection of low level (minimal residual disease) myeloma cells after therapy
Interpretation

The interpretation of the test is done by an evaluating automated and manually gated populations to isolate abnormal plasma cells. If there is an abnormal plasma cell population (cluster of 20 cells or more), then the result is minimal residual disease (MRD)-positive, with the percentage of abnormal plasma cells out of total analyzed events. If no abnormal population is found, then the result will be interpreted as MRD-negative.

Cautions

There are situations in which current gating strategies are insufficient to identify abnormal plasma cells. This can occur if the abnormal plasma cells do not phenotypically differ from normal plasma cells. In addition, in patients who have undergone therapeutic antibody treatment (anti-CD38, for example), decreased antigen expression on plasma cells may interfere with the gating strategy.

Clinical Reference


ADMINISTRATIVE

CPT Codes:

88184, 88185, 88188

COMPLETE VIEW

Available Stat:
No

Test Code:
MRDMM

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Flow cytometric immunophenotyping

Collect:
Lavender top, ACD

Amount to Collect:
See Preferred volume

Sample Type:
Bone marrow

Preferred Volume:
4 mL

Minimum Volume:
2 mL

Specimen Preparation:
Do not aliquot sample. Transport to CB ambient. Order Mayo test code MRDMM.
Reference Interval:
An interpretive report will be provided.

This test will be processed as a laboratory consultation. An interpretation of the immunophenotypic findings and correlation with the previous patient history will be provided by a hematopathologist for every case.

Synonyms:
- Euroflow MRD

Stability (from collection to initiation):
72 hours

Reported:
2 - 4 days

Additional Information:
- High-sensitivity flow cytometry test for detection of minimal residual myeloma cells, post treatment
- Adopted EuroFlow guidelines and Cytognos software
- Sensitivity of 10\(^{-5}\) or better, depending on the antigenic profile of abnormal plasma cells

Clinical Information
Multiple myeloma is an incurable malignant neoplasm of plasma cells. One of the best prognostic factors in multiple myeloma is the level of minimal residual disease post chemotherapy or autologous stem cell transplantation. The greater depth of the response (less malignant cells present), the longer time to progression and overall survival.(1)

Useful For
Detection of low level (minimal residual disease) myeloma cells after therapy

Interpretation
The interpretation of the test is done by an evaluating automated and manually gated populations to isolate abnormal plasma cells. If there is an abnormal plasma cell population (cluster of 20 cells or more), then the result is minimal residual disease (MRD)-positive, with the percentage of abnormal plasma cells out of total analyzed events. If no abnormal population is found, then the result will be interpreted as MRD-negative.

Cautions
There are situations in which current gating strategies are insufficient to identify abnormal plasma cells. This can occur if the abnormal plasma cells do not phenotypically differ from normal plasma cells. In addition, in patients who have undergone therapeutic antibody treatment (anti-CD38, for example), decreased antigen expression on plasma cells may interfere with the gating strategy.

Clinical Reference

CPT Codes:
88184, 88185, 88188
**Mumps Antibody, IgM**

**MUMM**

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Focus via Quest
- **Methodology:** Immunofluorescent assay
- **Reported:** 1-4 days

**COLLECTION**

- **Sample Type:** Serum
- **Collect:** Gold top or Red top
- **Amount to Collect:** 2 mL blood
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.5 mL serum
- **Unacceptable Conditions:** Gross hemolysis or lipemia
- **Rejection Criteria:** Gross hemolysis or lipemia

**PROCESSING**

- **Test Code:** MUMM
- **Sendout:** Yes
- **Performing Lab:** Focus via Quest
- **Preferred Volume:** 1 mL serum
- **Minimum Volume:** 0.5 mL serum
- **Unacceptable Conditions:** Gross hemolysis or lipemia
- **Rejection Criteria:** Gross hemolysis or lipemia

**RESULT INTERPRETATION**

- **Units:** Titer
- **Reference Interval:**

**Printed 06/07/19**
Test information subject to change
<1:20 titer

**ADMINISTRATIVE**

CPT Codes:
86735-90

**COMPLETE VIEW**

Available Stat:
No

Test Code:
MUMM

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immunofluorescent assay

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Rejection Criteria:
Gross hemolysis or lipemia

Unacceptable Conditions:
Gross hemolysis or lipemia

Units:
Titer

Reference Interval:
<1:20 titer

Reported:
1-4 days

CPT Codes:
86735-90

Test information subject to change.
# Mumps virus Antibody, IgG

**MUMG**

## ORDERING

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Stat:</td>
<td>No</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Immunology</td>
</tr>
<tr>
<td>Performed:</td>
<td>Monday-Friday (day shift)</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Chemiluminescent Immunoassay</td>
</tr>
<tr>
<td>Reported:</td>
<td>1-4 days.</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>This test is designed to measure IgG antibody. Positive results in neonates must be interpreted with caution, since maternal IgG is transferred passively from the mother to the fetus before birth. A definitive diagnosis requires viral isolation. Samples collected very early in the course of an infection may not have detectable levels of IgG. In such cases, it is recommended that an IgM assay be performed. Heterotypic antibodies exist between mumps and parainfluenza virus. Therefore, to confirm the clinical diagnosis of an atypical mumps infection, it is recommended that testing for parainfluenza be done simultaneously to rule out potential cross-reactivity. Antibody response to vaccination is lower than that of a natural mumps infection.</td>
</tr>
</tbody>
</table>

## COLLECTION

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Type:</td>
<td>Serum</td>
</tr>
<tr>
<td>Collect:</td>
<td>Gold top</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>1 mL blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>0.2 mL serum</td>
</tr>
<tr>
<td>Unacceptable Conditions:</td>
<td>Grossly hemolyzed, lipemic or icteric samples</td>
</tr>
</tbody>
</table>

## PROCESSING

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Code:</td>
<td>MUMG</td>
</tr>
<tr>
<td>Test Group:</td>
<td>Mumps</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Immunology</td>
</tr>
<tr>
<td>Specimen Preparation:</td>
<td>Freeze serum at -20C.</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>0.5 mL serum</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td></td>
</tr>
</tbody>
</table>
0.2 mL serum

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric samples

**RESULT INTERPRETATION**

**Units:**
- AU/mL

**Reference Interval:**
- Negative / Not-immune: < 9.0
- Equivocal: 9.0 - 10.9
- Positive / Immune: >= 11.0

**Additional Information:**
- This test is designed to measure IgG antibody. Positive results in neonates must be interpreted with caution, since maternal IgG is transferred passively from the mother to the fetus before birth. A definitive diagnosis requires viral isolation.

- Samples collected very early in the course of an infection may not have detectable levels of IgG. In such cases, it is recommended that an IgM assay be performed.

- Heterotypic antibodies exist between mumps and parainfluenza virus. Therefore, to confirm the clinical diagnosis of an atypical mumps infection, it is recommended that testing for parainfluenza be done simultaneously to rule out potential cross-reactivity.

- Antibody response to vaccination is lower than that of a natural mumps infection.

**ADMINISTRATIVE**

**CPT Codes:**
- 86735

**LOINC Codes:**
- 6476-6

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- MUMG

**Test Group:**
- Mumps

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday (day shift)

**Methodology:**
- Chemiluminescent Immunoassay

**Collect:**
- Gold top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.2 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed, lipemic or icteric samples

**Specimen Preparation:**
Freeze serum at -20C.

**Units:**
AU/mL

**Reference Interval:**
- Negative / Not-immune: < 9.0
- Equivocal: 9.0 - 10.9
- Positive / Immune: >= 11.0

**Reported:**
1-4 days.

**Additional Information:**
This test is designed to measure IgG antibody. Positive results in neonates must be interpreted with caution, since maternal IgG is transferred passively from the mother to the fetus before birth. A definitive diagnosis requires viral isolation.

Samples collected very early in the course of an infection may not have detectable levels of IgG. In such cases, it is recommended that an IgM assay be performed.

Heterotypic antibodies exist between mumps and parainfluenza virus. Therefore, to confirm the clinical diagnosis of an atypical mumps infection, it is recommended that testing for parainfluenza be done simultaneously to rule out potential cross-reactivity.

Antibody response to vaccination is lower than that of a natural mumps infection.

**CPT Codes:**
86735

**LOINC Codes:**
6476-6
Mumps virus RNA
P319

ORDERING

Approval Required:
   Patient’s physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Available Stat:
   No

Performing Lab:
   State Viral & Rickettsial Disease Lab

Methodology:
   PCR, serology, culture (if indicated)

Reported:
   PCR: 1 week
   Culture: 3 weeks

COLLECTION

Sample Type:
   Buccal swab & serum

Collect:
   Flocked swab in Universal Transport Medium: Buccal swab
   Gold top: Blood

Amount to Collect:
   Buccal swab x1
   4 mL blood

Preferred Volume:
   1 swab
   2 mL serum

Minimum Volume:
   1 swab
   1 mL serum

Remarks:
   Patient’s physician must complete Viral & Rickettsial Disease Specimen Submittal Form found on CDPH website:

   https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/VRDL_Specimen_Submittal_Forms.aspx

   Submit form with an APeX requisition requesting this test.

   Collect buccal swab as soon as possible but not later than 9 days of onset of parotitis. Swab the inner surface of cheek with swab and place swab in Universal Transport Medium.

   Stability (from collection to initiation):
      Refrigerated 3 days.

   Rejection Criteria:
      Swab not received in suitable transport medium

PROCESSING

Test Code:
   P319

Test Group:
   Mumps

Sendout:
   Yes
Performing Lab:
State Viral & Rickettsial Disease Lab

Specimen Preparation:
Freeze specimen at -70ºC.

Preferred Volume:
1 swab
2 mL serum

Minimum Volume:
1 swab
1 mL serum

Rejection Criteria:
Swab not received in suitable transport medium

Stability (from collection to initiation):
Refrigerated 3 days.

RESULT INTERPRETATION

Reference Interval:
No virus detected

COMPLETE VIEW

Approval Required:
Patient's physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Available Stat:
No

Test Code:
P319

Test Group:
Mumps

Performing Lab:
State Viral & Rickettsial Disease Lab

Sendout:
Yes

Methodology:
PCR, serology, culture (if indicated)

Remarks:
Patient's physician must complete Viral & Rickettsial Disease Specimen Submittal Form found on CDPH website:

https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/VRDL_Specimen_Submittal_Forms.aspx

Submit form with an APeX requisition requesting this test.

Collect buccal swab as soon as possible but not later than 9 days of onset of parotitis. Swab the inner surface of cheek with swab and place swab in Universal Transport Medium.

Collect:
Flocked swab in Universal Transport Medium: Buccal swab
Gold top: Blood

Amount to Collect:
Buccal swab x1
4 mL blood

Sample Type:
Buccal swab & serum

Preferred Volume:
1 swab
2 mL serum
Minimum Volume:
1 swab
1 mL serum

Rejection Criteria:
Swab not received in suitable transport medium

Specimen Preparation:
Freeze specimen at -70°C.

Reference Interval:
No virus detected

Stability (from collection to initiation):
Refrigerated 3 days.

Reported:
PCR: 1 week
Culture: 3 weeks
MuSK Antibody

ORDERING

Performing Lab:
Athena via Quest

Methodology:
Radioimmunoassay

Reported:
1 week

Additional Information:
Detection of antibodies to muscle-specific receptor tyrosine kinase (MuSK) (titer test).

Synonyms:
- MuSK Autoantibody
- Muscle-specific receptor tyrosine kinase

COLLECTION

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
4 mL (blood)

Preferred Volume:
2 mL (serum)

Minimum Volume:
0.5 mL (serum)

Stability (from collection to initiation):
Room temperature: 72 hours
Refrigerated: 42 days
Frozen: 1 year

Rejection Criteria:
Hemolysis, Lipemia

PROCESSING

Test Code:
MUSK

Sendout:
Yes

Performing Lab:
Athena via Quest

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 18842.

Preferred Volume:
2 mL (serum)

Minimum Volume:
0.5 mL (serum)

Rejection Criteria:
Hemolysis, Lipemia

Stability (from collection to initiation):
Room temperature: 72 hours
RESULT INTERPRETATION

Units:
   Titer
Reference Interval:
   <1:10
Additional Information:
   Detection of antibodies to muscle-specific receptor tyrosine kinase (MuSK) (titer test).

ADMINISTRATIVE

CPT Codes:
   83519

COMPLETE VIEW

Test Code:
   MUSK
Performing Lab:
   Athena via Quest
Sendout:
   Yes
Methodology:
   Radioimmunoassay
Collect:
   Gold top or Red top
Amount to Collect:
   4 mL (blood)
Sample Type:
   Serum
Preferred Volume:
   2 mL (serum)
Minimum Volume:
   0.5 mL (serum)
Rejection Criteria:
   Hemolysis, Lipemia
Specimen Preparation:
   Aliquot and freeze. Transport to CB frozen. Order Quest test code 18842.
Units:
   Titer
Reference Interval:
   <1:10
Synonyms:
   • MuSK Autoantibody
   • Muscle-specific receptor tyrosine kinase
Stability (from collection to initiation):
   Room temperature: 72 hours
   Refrigerated: 42 days
   Frozen: 1 year
Reported:
   1 week
Additional Information:

Printed 06/07/19
Test information subject to change
Detection of antibodies to muscle-specific receptor tyrosine kinase (MuSK) (titer test).

**CPT Codes:**

83519
**MYC FISH**

**MOLT**

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**ORDERING**

Available Stat: No

Performing Lab: Mayo

Performed: Run 2x per week, Monday & Wednesday, day shift only

Methodology: Fluorescent in-situ hybridization (FISH)

Reported: 10-14 days

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

MYC (c-myc) amplification by FISH is designed to detect gain of the MYC locus in tumors. Amplification of MYC has been associated with poor prognosis in Medulloblastoma.

The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.

The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

Synonyms:
- CMYC
- C-MYC

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**COLLECTION**

Sample Type:

Formalin-fixed, paraffin-embedded tissue on three (3) unstained slides (5 microns thick) on charged glass. One adjacent hematoxylin and eosin stained (H&E) slide should also be included. Slides should be labeled with pathology case number and block identification.

Preferred Volume:

3 unstained slides (5 micron thick sections)

Minimum Volume:

1 unstained slides (5 micron thick sections)

Stability (from collection to initiation):

Slides are stable indefinitely at room temperature

Unacceptable Conditions:

All required slides not included. Insufficient tumor present on slide as determined by pathologist. Slides not labeled or not accompanied by completed requisition form.

---

**PROCESSING**

Test Code: MOLT

Test Group: Oncology FISH

Sendout: Yes

Performing Lab: Mayo
Preferred Volume:
3 unstained slides (5 micron thick sections)

Minimum Volume:
1 unstained slides (5 micron thick sections)

Unacceptable Conditions:
All required slides not included. Insufficient tumor present on slide as determined by pathologist. Slides not labeled or not accompanied by completed requisition form.

Stability (from collection to initiation):
Slides are stable indefinitely at room temperature

RESULT INTERPRETATION

Units:
Ratio of MYC to CEP8 signals

Reference Interval:
1.03 +/- 0.19

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

MYC (c-myc) amplification by FISH is designed to detect gain of the MYC locus in tumors. Amplification of MYC has been associated with poor prognosis in Medulloblastoma.

The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.

The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

ADMINISTRATIVE

CPT Codes:
88377-90

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT

Test Group:
Oncology FISH

Performing Lab:
Mayo

Sendout:
Yes

Performed:
Run 2x per week, Monday & Wednesday, day shift only

Methodology:
Fluorescent in-situ hybridization (FISH)

Sample Type:
Formalin-fixed, paraffin-embedded tissue on three (3) unstained slides (5 microns thick) on charged glass. One adjacent hematoxylin and eosin stained (H&E) slide should also be included. Slides should be labeled with pathology case number and block identification.

Preferred Volume:
3 unstained slides (5 micron thick sections)
Minimum Volume:
1 unstained slides (5 micron thick sections)

Unacceptable Conditions:
All required slides not included. Insufficient tumor present on slide as determined by pathologist. Slides not labeled or not accompanied by completed requisition form.

Units:
Ratio of MYC to CEP8 signals

Reference Interval:
1.03 +/- 0.19

Synonyms:
• CMYC
• C-MYC

Stability (from collection to initiation):
Slides are stable indefinitely at room temperature

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

MYC (c-myc) amplification by FISH is designed to detect gain of the MYC locus in tumors. Amplification of MYC has been associated with poor prognosis in Medulloblastoma.

The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.

The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

CPT Codes:
88377-90

LDT or Modified FDA:
Yes
MYC Rearrangement Break Apart FISH
MYC, BMYC

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-Situ Hybridization
Reported: 1-2 weeks
Synonyms:
- MYC Rearrangement FISH
- MYC
- BMYC

COLLECTION

Sample Type:
- Heparinized blood or bone marrow aspirate
- Bone biopsy
Collect:
- Blood or marrow aspirate: Dark Green top
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Remarks:
- Mix blood and marrow aspirates well
Stability (from collection to initiation):
- 2 days at room temperature
Unacceptable Conditions:
- Insufficient sample or not collected in heparin

PROCESSING

Test Code:
- BMYC: Blood
- MYC: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.
Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
?Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- ?Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Insufficient sample or not collected in heparin

**Stability (from collection to initiation):**
- 2 days at room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 59050-5, 29308-4

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BMYC: Blood
- MYC: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Methodology:**
- Fluorescent in-Situ Hybridization

**Remarks:**
- Mix blood and marrow aspirates well

**Collect:**
- Blood or marrow aspirate: Dark Green top

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Sample Type:**
- Heparinized blood or bone marrow aspirate
- Bone biopsy

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- ?Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- ?Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Insufficient sample or not collected in heparin

**Specimen Preparation:**
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

**Synonyms:**
- MYC Rearrangement FISH
• MYC
• BMYC

Stability (from collection to initiation):

2 days at room temperature

Reported:

1-2 weeks

CPT Codes:

88271 x2, 88275

LDT or Modified FDA:

Yes

LOINC Codes:

59050-5, 29308-4
MYCN FISH
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Performed:
Run 2x per week, Monday & Wednesday, day shift only
Methodology:
Fluorescent in-situ hybridization (FISH)
Reported:
10-14 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
MYCN (n-myc) amplification by FISH is designed to detect gain of the MYCN locus in tumors. Amplification of MYCN has been associated with poor prognosis in Neuroblastoma and Medulloblastoma.
The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.
The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.
Synonyms:
• N-MYC
• NMYC

COLLECTION

Sample Type:
Formalin-fixed, paraffin-embedded tissue on three (3) unstained slides (5 microns thick) on charged glass. One adjacent hematoxylin and eosin stained (H&E) slide should also be included. Slides should be labeled with pathology case number and block identification.
Preferred Volume:
3 unstained slides (5 micron thick sections)
Minimum Volume:
1 unstained slides (5 micron thick sections)
Stability (from collection to initiation):
Slides are stable indefinitely at room temperature

PROCESSING

Test Code:
MOLT
Test Group:
Oncology FISH
Sendout:
Yes
Performing Lab:
Mayo
Preferred Volume:
3 unstained slides (5 micron thick sections)
Minimum Volume:
1 unstained slides (5 micron thick sections)

**Stability (from collection to initiation):**

Slides are stable indefinitely at room temperature

---

**RESULT INTERPRETATION**

**Units:**

- Ratio of MYCN to CEP2 signals

**Reference Interval:**

1.09 +/- 0.22

**Additional Information:**

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

MYCN (n-myc) amplification by FISH is designed to detect gain of the MYCN locus in tumors. Amplification of MYCN has been associated with poor prognosis in Neuroblastoma and Medulloblastoma.

The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.

The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

---

**ADMINISTRATIVE**

**CPT Codes:**

- 88377-90

**LDT or Modified FDA:**

- Yes

---

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- MOLT

**Test Group:**

- Oncology FISH

**Performing Lab:**

- Mayo

**Sendout:**

- Yes

**Performed:**

- Run 2x per week, Monday & Wednesday, day shift only

**Methodology:**

- Fluorescent in-situ hybridization (FISH)

**Sample Type:**

- Formalin-fixed, paraffin-embedded tissue on three (3) unstained slides (5 microns thick) on charged glass. One adjacent hematoxylin and eosin stained (H&E) slide should also be included. Slides should be labeled with pathology case number and block identification.

**Preferred Volume:**

- 3 unstained slides (5 micron thick sections)

**Minimum Volume:**

- 1 unstained slides (5 micron thick sections)

**Units:**

- Ratio of MYCN to CEP2 signals

**Reference Interval:**

1.09 +/- 0.22
Synonyms:
- N-MYC
- NMYC

Stability (from collection to initiation):
Slides are stable indefinitely at room temperature

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

MYCN (n-myc) amplification by FISH is designed to detect gain of the MYCN locus in tumors. Amplification of MYCN has been associated with poor prognosis in Neuroblastoma and Medulloblastoma.

The clinical interpretation of this test should be evaluated within the context of the patient's medical history, other diagnostic tests, and the histologic and immunohistochemical features of the tumor.

The test was validated by UCSF Clinical Laboratories to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

CPT Codes:
88377-90

LDT or Modified FDA:
Yes
**Mycobacterium tuberculosis complex PCR**  
P290

### ORDERING

**Approval Required:**
Approval required for samples other than sputum. Contact Microbiology at 415-353-1268.

**Available Stat:**
No

**Performing Lab:**
- Sputum: Microbiology
- Other sample types: Quest

**Performed:**
Monday-Friday, day shift.

**Methodology:**
PCR

**Reported:**
- Sputum: 48 hours
- Other sample types: 4 - 7 days

**Additional Information:**
- Sensitivity has been found to be lower in smear negative sputum specimens than in smear positive sputum specimens.
- This test was developed and its performance characteristics have been determined by the performing laboratory. It has not been cleared or approved by the U.S. FDA.
- Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**Reflex Testing:**
Test performed automatically on first smear positive respiratory specimens. Test can be ordered w/out the reflex.

**Synonyms:**
- TB
- AFB
- tuberculosis

### COLLECTION

**Sample Type:**
- Sputum, tracheal aspirate, bronchoalveolar lavage, bronchial wash

**Collect:**
Sterile, screw-cap container

**Amount to Collect:**
See preferred volume

**Preferred Volume:**
- Sputum, tracheal aspirate: 5 mL
- Bronchoalveolar lavage, bronchial wash: 7 mL

**Minimum Volume:**
- Sputum, tracheal aspirate: 1 mL
- Bronchoalveolar lavage, bronchial wash: 2 mL

**Remarks:**
- For sputum, collect first morning sputum

**Stability (from collection to initiation):**
Refrigerated 2 weeks.

**Rejection Criteria:**
Received at room temperature
**PROCESSING**

**Test Code:**
- P290

**Sendout:**
- Sputum: No
- Other sample types: Yes

**Performing Lab:**
- Sputum: Microbiology
- Other sample types: Quest

**Specimen Preparation:**
- Specimens sent to Quest are accessioned as P319.
- Send decontaminated and concentrated respiratory specimens to the reference lab in a sealed container. Keep specimen refrigerated and transport using cold packs.

**Preferred Volume:**
- Sputum, tracheal aspirate: 5 mL
- Bronchoalveolar lavage, bronchial wash: 7 mL

**Minimum Volume:**
- Sputum, tracheal aspirate: 1 mL
- Bronchoalveolar lavage, bronchial wash: 2 mL

**Rejection Criteria:**
- Received at room temperature

**Stability (from collection to initiation):**
- Refrigerated 2 weeks.

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative for Mycobacterium tuberculosis complex

**Critical Values:**
- Inpatient results only. After hours outpatient results will be phoned the following morning. First positive M. tuberculosis PCR; Repeat call only for positive sample from different site or > 2 months since last call.

**Additional Information:**
- Sensitivity has been found to be lower in smear negative sputum specimens than in smear positive sputum specimens.
- This test was developed and its performance characteristics have been determined by the performing laboratory. It has not been cleared or approved by the U.S. FDA.
- Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

**ADMINISTRATIVE**

**CPT Codes:**
- 87556-90

**LOINC Codes:**
- 85362-2

**COMPLETE VIEW**

**Approval Required:**
- Approval required for samples other than sputum. Contact Microbiology at 415-353-1268.

**Available Stat:**
- No

**Test Code:**
Performing Lab:
Sputum: Microbiology
Other sample types: Quest

Sendout:
Sputum: No
Other sample types: Yes

Performed:
Monday-Friday, day shift.

Methodology:
PCR

Remarks:
For sputum, collect first morning sputum

Collect:
Sterile, screw-cap container

Amount to Collect:
See preferred volume

Sample Type:
Sputum, tracheal aspirate, bronchoalveolar lavage, bronchial wash

Preferred Volume:
Sputum, tracheal aspirate: 5 mL
Bronchoalveolar lavage, bronchial wash: 7 mL

Minimum Volume:
Sputum, tracheal aspirate: 1 mL
Bronchoalveolar lavage, bronchial wash: 2 mL

Rejection Criteria:
Received at room temperature

Specimen Preparation:
Specimens sent to Quest are accessioned as P319.

Send decontaminated and concentrated respiratory specimens to the reference lab in a sealed container. Keep specimen refrigerated and transport using cold packs.

Reference Interval:
Negative for Mycobacterium tuberculosis complex

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. First positive M. tuberculosis PCR; Repeat call only for positive sample from different site or > 2 months since last call.

Synonyms:
- TB
- AFB
- tuberculosis

Stability (from collection to initiation):
Refrigerated 2 weeks.

Reported:
Sputum: 48 hours
Other sample types: 4 - 7 days

Reflex Testing:
Test performed automatically on first smear positive respiratory specimens. Test can be ordered w/out the reflex.

Additional Information:
Sensitivity has been found to be lower in smear negative sputum specimens than in smear positive sputum specimens.

This test was developed and its performance characteristics have been determined by the performing laboratory. It has not been cleared or approved by the U.S. FDA.

Positive results are automatically forwarded to California Public Health per regulations. However, this does not absolve the ordering provider from any additional reporting if such is required.

CPT Codes:
Mycophenolic Acid
MYCPA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Set up daily. Turnaround 2 days
Synonyms:
- CellCept
- Cell Cept
- MPA
- MPA glucuronide
- mycophenolic acid glucuronide

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL
Minimum Volume:
0.5 mL
Remarks:
Optimum time to collect sample: 0.5 to 1 hr before next dose (trough) at steady state (3-5 days after treatment with oral doses).
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 2 weeks.
Unacceptable Conditions:
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Collected in Gold top Specimens collected in other tube types not specified.
Rejection Criteria:
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Specimens collected in gel barrier tubes. Specimens collected in other tube types not specified.

PROCESSING

Test Code:
MYCPA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Allow blood to clot at 15-28C for 20-30 min. Centrifuge 2500-2800 rpm for 8-10 min. Transfer serum to aliquot tubes, ship refrigerated to
China Basin sendouts. Order Quest test #10662

**Preferred Volume:**
- 1 mL

**Minimum Volume:**
- 0.5 mL

**Unacceptable Conditions:**
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Collected in Gold top Specimens collected in other tube types not specified.

**Rejection Criteria:**
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Specimens collected in gel barrier tubes. Specimens collected in other tube types not specified.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 2 weeks, frozen 2 weeks.

### RESULT INTERPRETATION

**Units:**
- µg/mL

**Reference Interval:**
- Mycophenolic acid: 1.0-3.5 µg/mL (trough)
- MPA Glucuronide: 35.0-100.0 µg/mL (trough)

**Critical Values:**
- Mycophenolic acid:
  - Quest Critical 1: < 0.5 µg/mL
  - Quest Priority 2: < 1.0 µg/mL or > 3.5 µg/mL
- MPA Glucuronide: Priority 2 < 35 µg/mL

### ADMINISTRATIVE

**CPT Codes:**
- 83789-90

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- MYCPA

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- LC/MS/MS

**Remarks:**
Optimum time to collect sample: 0.5 to 1 hr before next dose (trough) at steady state (3-5 days after treatment with oral doses).

**Collect:**
Red top (Gold top NOT acceptable)

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 1 mL

**Minimum Volume:**
0.5 mL

Rejection Criteria:
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Specimens collected in gel barrier tubes. Specimens collected in other tube types not specified.

Unacceptable Conditions:
Hemolysis, Lipemia, left at room temperature for more than 72 hrs. Collected in Gold top Specimens collected in other tube types not specified.

Specimen Preparation:
Allow blood to clot at 15-28°C for 20-30 min. Centrifuge 2500-2800 rpm for 8-10 min. Transfer serum to aliquot tubes, ship refrigerated to China Basin sendouts. Order Quest test #10662

Units:
µg/mL

Reference Interval:
Mycophenolic acid: 1.0-3.5 µg/mL (trough)
MPA Glucuronide: 35.0-100.0 µg/mL (trough)

Critical Values:
Mycophenolic acid:
Quest Critical 1: < 0.5 µg/mL
Quest Priority 2: < 1.0 µg/mL or > 3.5 µg/mL

MPA Glucuronide: Priority 2 < 35 µg/mL

Synonyms:
- CellCept
- Cell Cept
- MPA
- MPA glucuronide
- mycophenolic acid glucuronide

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 2 weeks.

Reported:
Set up daily. Turnaround 2 days

CPT Codes:
83789-90
**Mycoplasma pneumoniae Antibody**

**MYCOP**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Enzyme Immunoassay

**Reported:**
Test set up 5x per week. Turnaround 3-5 days

**Synonyms:**
- M. pneumoniae Ab

### COLLECTION

**Sample Type:**
Serum

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

### PROCESSING

**Test Code:**
MYCOP

**Test Group:**
Mycoplasma

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Refrigerate sample. Order Quest test # 54619N

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

### RESULT INTERPRETATION

**Units:**
**Index**

**Reference Interval:**

<0.5 Index

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**ADMINISTRATIVE**

**CPT Codes:**

86738-90

**LOINC Codes:**

5253-0

---

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

MYCOP

**Test Group:**

Mycoplasma

**Performing Lab:**

Quest

**Sendout:**

Yes

**Methodology:**

Enzyme Immunoassay

**Collect:**

Gold top or Red top

**Amount to Collect:**

2 mL blood

**Sample Type:**

Serum

**Preferred Volume:**

1 mL serum

**Minimum Volume:**

0.5 mL serum

**Specimen Preparation:**

Refrigerate sample. Order Quest test # 54619N

**Units:**

Index

**Reference Interval:**

<0.5 Index

**Synonyms:**

- M. pneumoniae Ab

**Stability (from collection to initiation):**

Room temperature 4 days, refrigerated 1 week, frozen at -20°C 1 month

**Reported:**

Test set up 5x per week. Turnaround 3-5 days

**CPT Codes:**

86738-90

**LOINC Codes:**

5253-0
Mycoplasma pneumoniae DNA
P319

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: Real time PCR
Additional Information: Organisms may be detected by PCR prior to detection by immunological methods. This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. FDA
Synonyms: M. pneumoniae

COLLECTION

Sample Type: Bronchial lavage/wash, sputum, or NP swab
Collect: Bronchial lavage/wash, sputum: Sterile screw-cap container; NP swab: Flocked swab in Universal Transport Medium (UTM)
Amount to Collect: Bronchial lavage/wash, sputum: 1 mL; NP swab: One swab in UTM
Preferred Volume: Bronchial lavage/wash, sputum: 1 mL; NP swab: One swab in UTM
Minimum Volume: Bronchial lavage/wash, sputum: 0.3 mL; NP swab: One swab in UTM
Stability (from collection to initiation): Room temperature 48 hours, refrigerated 14 days, frozen 30 days

PROCESSING

Test Code: P319
Test Group: Mycoplasma
Sendout: Yes
Performing Lab: Focus via Quest
Specimen Preparation: Order Quest test # 15498X Refrigerate sample during transport and freeze at -70ºC on receipt at China Basin.
Preferred Volume: Bronchial lavage/wash, sputum: 1 mL; NP swab: One swab in UTM
Minimum Volume: Bronchial lavage/wash, sputum: 0.3 mL; NP swab: One swab in UTM
Stability (from collection to initiation): Room temperature 48 hours, refrigerated 14 days, frozen 30 days

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Reference Interval:
Not detected

Additional Information:
Organisms may be detected by PCR prior to detection by immunological methods. This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. FDA

CPT Codes:
87581-90

LOINC Codes:
29257-3

Available Stat:
No

Test Code:
P319

Test Group:
Mycoplasma

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Real time PCR

Collect:
Bronchial lavage/wash, sputum: Sterile screw-cap container; NP swab: Flocked swab in Universal Transport Medium (UTM)

Amount to Collect:
Bronchial lavage/wash, sputum: 1 mL; NP swab: One swab in UTM

Sample Type:
Bronchial lavage/wash, sputum, or NP swab

Preferred Volume:
Bronchial lavage/wash, sputum: 1 mL; NP swab: One swab in UTM

Minimum Volume:
Bronchial lavage/wash, sputum: 0.3 mL; NP swab: One swab in UTM

Specimen Preparation:
Order Quest test # 15498X Refrigerate sample during transport and freeze at -70ºC on receipt at China Basin.

Reference Interval:
Not detected

Synonyms:
- M. pneumoniae

Stability (from collection to initiation):
Room temperature 48 hours, refrigerated 14 days, frozen 30 days

Additional Information:
Organisms may be detected by PCR prior to detection by immunological methods. This test was developed and its performance characteristics have been determined by Quest Diagnostics Nichols Institute. It has not been cleared or approved by the U.S. FDA

CPT Codes:
87581-90

LOINC Codes:
29257-3
Myelin associated glycoprotein antibody, IgM
MAGM

ORDERING

Approval Required:
Use restricted to Neurology service.

Available Stat:
No

Performing Lab:
Quest

Methodology:
EIA

Reported:
Performed 2x per week. Turn around 5-7 days

Additional Information:
MAG (myelin-associated glycoprotein) antibodies are commonly associated with demyelinating sensory-motor neuropathies.

Synonyms:
- myelin associated glycoprotein
- MAG

COLLECTION

Sample Type:
Serum

Collect:
Red top (Gold top acceptable)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen at -20C 1 month.

Rejection Criteria:
Received at room temperature

PROCESSING

Test Code:
MAGM

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Refrigerate sample. Order Quest # 34134N

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Rejection Criteria:
Received at room temperature

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
- titer

Reference Interval:
- Normal: < 1:1600
- Moderately Elevated: 1:1600-1:3200
- Highly Elevated: >= 1:6400

Additional Information:
- MAG (myelin-associated glycoprotein) antibodies are commonly associated with demyelinating sensory-motor neuropathies.

ADMINISTRATIVE

CPT Codes:
- 83520-90

LOINC Codes:
- 39087-2

COMPLETE VIEW

Approval Required:
- Use restricted to Neurology service.

Available Stat:
- No

Test Code:
- MAGM

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- EIA

Collect:
- Red top (Gold top acceptable)

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.2 mL serum

Rejection Criteria:
- Received at room temperature

Specimen Preparation:
- Refrigerate sample. Order Quest # 34134N

Units:
- titer

Reference Interval:
- Normal: < 1:1600
- Moderately Elevated: 1:1600-1:3200
Highly Elevated: >= 1:6400

**Synonyms:**
- myelin associated glycoprotein
- MAG

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 1 week, frozen at -20C 1 month.

**Reported:**
- Performed 2x per week. Turn around 5-7 days

**Additional Information:**
- MAG (myelin-associated glycoprotein) antibodies are commonly associated with demyelinating sensory-motor neuropathies.

**CPT Codes:**
- 83520-90

**LOINC Codes:**
- 39087-2
Myelodysplastic Syndrome FISH Panel
CYMDS, BCYMDS

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Monday - Friday day shift

Methodology:
Fluorescence in situ Hybridization (FISH)

Reported:
1-2 weeks

Additional Information:
Includes FISH probes for the following markers: Trisomy 8, Deletion 20q, Monosomy 5, Deletion 5q, Monosomy 7.

The individual FISH markers are orderable separately

Synonyms:
- M5D5Q
- M7D7Q
- TRIS8
- DEL20Q
- Myelodysplasia
- pre-leukemia
- Trisomy 8
- Deletion 20Q
- Monosomy 5
- Deletion 5q
- Monosomy 7
- Deletion 7q
- MDS
- CYMDS
- BCYMDS

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core

Collect:
Dark green top

Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Remarks:
Transport samples at room temperature

Stability (from collection to initiation):
Room temperature 2 days

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

**PROCESSING**

Test Code:
BCYMDS: Blood
CYMDS: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Do not centrifuge, store a room temperature. Transport samples to Cytogenetics as soon as possible.

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

Stability (from collection to initiation):
Room temperature 2 days

**RESULT INTERPRETATION**

Additional Information:
Includes FISH probes for the following markers: Trisomy 8, Deletion 20Q, Monosomy 5, Deletion 5q, Monosomy 7.

The individual FISH markers are orderable separately

**ADMINISTRATIVE**

CPT Codes:
88271 x12, 88275 x6

LDT or Modified FDA:
Yes

**COMPLETE VIEW**

Available Stat:
No

Test Code:
BCYMDS: Blood
CYMDS: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Monday - Friday day shift

Methodology:
Fluorescence in situ Hybridization (FISH)

Remarks:
Transport samples at room temperature

Collect:
Dark green top

Amount to Collect:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Sample Type:
Heparinized whole blood, bone marrow aspirate or bone marrow biopsy core

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Unacceptable Conditions:
Frozen, cracked or mislabeled containers

Specimen Preparation:
Do not centrifuge, store at room temperature. Transport samples to Cytogenetics as soon as possible.

Synonyms:
- M5D5Q
- M7D7Q
- TRIS8
- DEL20Q
- Myelodysplasia
- pre-leukemia
- Trisomy 8
- Deletion 20Q
- Monosomy 5
- Deletion 5q
- Monosomy 7
- Deletion 7q
- MDS
- CYMDS
- BCYMDS

Stability (from collection to initiation):
Room temperature 2 days

Reported:
1-2 weeks

Additional Information:
Includes FISH probes for the following markers: Trisomy 8, Deletion 20Q, Monosomy 5, Deletion 5q, Monosomy 7.

The individual FISH markers are orderable separately

CPT Codes:
88271 x12, 88275 x6

LDT or Modified FDA:
Yes

Test information subject to change
Myeloid Malignancies Mutation Panel by Next Generation Sequencing
MMMP, MMMPM

ORDERING

Ordering Recommendations:
Assess for single gene mutations, including substitutions and insertions and deletions that may have diagnostic, prognostic, and/or therapeutic significance in acute myeloid leukemia, myelodysplastic syndromes, myeloproliferative neoplasms, or MDS/MPN overlap disorders such as chronic myelomonocytic leukemia.

Performing Lab:
ARUP

Performed:
Varies

Methodology:
Massively Parallel Sequencing

Reported:
12-14 days

Synonyms:
- Acute myeloid leukemia, AML
- ASXL1, ASXL2, BCOR, BCR/ABL1, BRAF, BRIP1/BRD3/BRD4, CALR, CBL, CEBPA, CSF3R, DNMT1, DNMT3A
- Atypical chronic myelogenous leukemia
- Chronic eosinophilic leukemia not otherwise specified
- Chronic myelogenous leukemia, BCR-ABL1 positive
- Chronic myelomonocytic leukemia, CMML
- Chronic neutrophilic leukemia
- EED, ELANE, ETNK1, ETV6, EZH2, FLT3, GATA1, GATA2, HNRNPK, IDH1, IDH2, JAK2, JAK3, KDM6A, KIT
- Eosinophilia
- Juvenile myelomonocytic leukemia, JMML
- KMT2A/MLL, KRAS, LUC7L2, MAP2K1, MPL, NOTCH1, NPM1, NRAS, NSD1, PHF6, PRPF40B, PRPF8, PTPN11
- Mastocytosis
- Myelodysplastic syndrome with isolated del(5q)
- Myelodysplastic syndromes
- Myelodysplastic/Myeloproliferative neoplasm
- Myeloproliferative neoplasm
- Myeloproliferative neoplasm, essential thrombocythemia
- Myeloproliferative neoplasm, polycythemia vera
- Myeloproliferative neoplasm, primary myelofibrosis
- RAD21, RUNX1, SETBP1, SF1, SF3A1, SF3B1, SMC1A, SMC3, SRSF2, STAG2, SUZ12
- Refractory anemia with excess blasts, RAEB
- Refractory anemia with ring sideroblasts associated with marked thrombocytosis, RARS-T
- Refractory anemia with ring sideroblasts, RARS
- Refractory cytopenia with multilineage dysplasia, RCMD
- Refractory cytopenia with unilineage dysplasia, RCUD
- TET2, TP53, U2AF1, U2AF2, WT1, ZRSR2

COLLECTION

Sample Type:
Blood or Bone marrow

Collect:
   Lavender (EDTA) OR Bone Marrow (EDTA).

Amount to Collect:
   5 mL blood or 2 mL bone marrow

Preferred Volume:
   5 mL blood or 2 mL bone marrow

Minimum Volume:
   1 mL blood or 1 mL bone marrow

Stability (from collection to initiation):
   Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Storage/Transport Temperature:
   Refrigerated.

Unacceptable Conditions:
   Serum, plasma or tissue. Specimens collected in anticoagulants other than EDTA. Clotted or grossly hemolyzed specimens.

PROCESSING

Test Code:
   MMMP (blood)
   MMMPM (bone marrow)

ARUP Test Code:
   2011117

Sendout:
   Yes

Performing Lab:
   ARUP

Specimen Preparation:
   Do not freeze. Transport 5 mL whole blood. (Min: 1 mL) OR Transport 3 mL bone marrow. (Min: 1 mL). Separate specimens must be submitted when multiple tests are ordered.

Preferred Volume:
   5 mL blood or 2 mL bone marrow

Minimum Volume:
   1 mL blood or 1 mL bone marrow

Unacceptable Conditions:
   Serum, plasma or tissue. Specimens collected in anticoagulants other than EDTA. Clotted or grossly hemolyzed specimens.

Stability (from collection to initiation):
   Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

Storage/Transport Temperature:
   Refrigerated.

RESULT INTERPRETATION

Reference Interval:
   By report

Interpretive Data:
   Refer to report.

ADMINISTRATIVE

CPT Codes:
   81455

LOINC:
   • 31208-2

Test information subject to change
Ordering Recommendations:
Assess for single gene mutations, including substitutions and insertions and deletions that may have diagnostic, prognostic, and/or therapeutic significance in acute myeloid leukemia, myelodysplastic syndromes, myeloproliferative neoplasms, or MDS/MPN overlap disorders such as chronic myelomonocytic leukemia.

Test Code:
- MMMP (blood)
- MMMPM (bone marrow)

ARUP Test Code:
2011117

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Varies

Methodology:
Massively Parallel Sequencing

Collect:
- Lavender (EDTA) OR Bone Marrow (EDTA).

Amount to Collect:
- 5 mL blood or 2 mL bone marrow

Sample Type:
- Blood or Bone marrow

Preferred Volume:
- 5 mL blood or 2 mL bone marrow

Minimum Volume:
- 1 mL blood or 1 mL bone marrow

Unacceptable Conditions:
Serum, plasma or tissue. Specimens collected in anticoagulants other than EDTA. Clotted or grossly hemolyzed specimens.

Specimen Preparation:
Do not freeze. Transport 5 mL whole blood. (Min: 1 mL) OR Transport 3 mL bone marrow. (Min: 1 mL). Separate specimens must be submitted when multiple tests are ordered.

Reference Interval:
By report

Interpretive Data:
Refer to report.

Synonyms:
- Acute myeloid leukemia, AML
- ASXL1, ASXL2, BCOR, BCORL1, BRAF, BRIMPS/FAM5C, CALR, CBL, CEBPA, CSF3R, DNMT1, DNMT3A
- Atypical chronic myelogenous leukemia
- Chronic eosinophilic leukemia not otherwise specified
- Chronic myelogenous leukemia, BCR-ABL1 positive
- Chronic myelomonocytic leukemia, CMML
- Chronic neutrophilic leukemia
- EED, ELANE, ETNK1, ETV6, EZH2, FLT3, GATA1, GATA2, HNRNPK, IDH1, IDH2, JAK2, JAK3, KDM6A, KIT
- Eosinophilia
- Juvenile myelomonocytic leukemia, JMML
- KMT2A/MLL, KRAS, LUC7L2, MAP2K1, MPL, NOTCH1, NPM1, NRAS, NSD1, PHF6, PRPF40B, PRPF8, PTPN11
- Mastocytosis
- Myelodysplastic syndrome with isolated del(5q)
- Myelodysplastic syndromes
- Myelodysplastic/Myeloproliferative neoplasm
- Myeloproliferative neoplasm
- Myeloproliferative neoplasm, essential thrombocythemia
- Myeloproliferative neoplasm, polycythemia vera
- Myeloproliferative neoplasm, primary myelofibrosis
- RAD21, RUNX1, SETBP1, SF1, SF3A1, SF3B1, SMC1A, SMC3, SRSF2, STAG2, SUZ12
- Refractory anemia with excess blasts, RAEB
- Refractory anemia with ring sideroblasts associated with marked thrombocytosis, RARS-T
- Refractory anemia with ring sideroblasts, RARS
- Refractory cytopenia with multilineage dysplasia, RCMD
- Refractory cytopenia with unilineage dysplasia, RCUD
- TET2, TP53, U2AF1, U2AF2, WT1, ZRSR2

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
Ambient: 24 hours; Refrigerated: 5 days; Frozen: Unacceptable

**Reported:**
12-14 days

**CPT Codes:**
81455

**LOINC:**
- 31208-2
- 35474-6
- 11526-1

**Notes:**
The diagnosis under consideration is required information to order this test. Genes tested: ASXL1, ASXL2, BCOR, BCORL1, BRAF, BRIP1, CALR, CBL, CEBPA, CSF3R, DNMT1, DNMT3A, EED, ELANE, ETNK1, ETV6, EZH2, FLT3, GATA1, GATA2, HNRNPK, IDH1, IDH2, JAK2, JAK3, KDM6A, KIT, KMT2A, KRAS, LUC7L2, MAP2K1, MPL, NOTCH1, NPM1, NRAS, NSD1, PHF6, PRPF40B, PRPF8, PTPN11, RAD21, RUNX1, SETBP1, SF1, SF3A1, SF3B1, SMC1A, SMC3, SRSF2, STAG2, SUZ12, TET2, TP53, U2AF1, U2AF2, WT1, ZRSR2

Note: The test information is subject to change.
Myeloperoxidase detection by flow cytometry

MPO

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Saturday (day shift)
Methodology:
Flow cytometry
Reported:
Results phoned within 48 hours. Written interpretive report sent within 7 days.
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
This test is generally only performed when results from the peroxidase stain performed in the Hematology section are negative or equivocal. This test is performed as part of the Leukemia/Lymphoma markers evaluation.
Synonyms:
- MPO
- Leukemia phenotyping
- flow cytometry

COLLECTION

Sample Type:
EDTA whole blood, Marrow, Unfixed tissue
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
Amount of specimen needed varies call Immunology, x3-1712, for consultation.

PROCESSING

Test Code:
MPO
Performing Lab:
Immunology
Specimen Preparation:
Typically ordered by Immunology only, if order received on a requisition contact Immunology to confirm.
This test is often confused with the test for Anti-Neutrophil antibodies (ANCA). Clarify what the requester is actually asking for.
Do not refrigerate
Preferred Volume:
Amount of specimen needed varies call Immunology, x3-1712, for consultation.

RESULT INTERPRETATION

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

This test is generally only performed when results from the peroxidase stain performed in the Hematology section are negative or equivocal. This test is performed as part of the Leukemia/Lymphoma markers evaluation.

**ADMINISTRATIVE**

**CPT Codes:**

- 88346

**LDT or Modified FDA:**

- Yes

**LOINC Codes:**

- 32759-3

**COMPLETE VIEW**

**Available Stat:**

- No

**Test Code:**

- MPO

**Performing Lab:**

- Immunology

**Performed:**

- Monday-Saturday (day shift)

**Methodology:**

- Flow cytometry

**Collect:**

- Lavender top

**Amount to Collect:**

- 3 mL blood

**Sample Type:**

- EDTA whole blood, Marrow, Unfixed tissue

**Preferred Volume:**

- Amount of specimen needed varies call Immunology, x3-1712, for consultation.

**Specimen Preparation:**

- Typically ordered by Immunology only, if order received on a requisition contact Immunology to confirm.

- This test is often confused with the test for Anti-Neutrophil antibodies (ANCA). Clarify what the requester is actually asking for.

- Do not refrigerate

**Synonyms:**

- MPO
- Leukemia phenotyping
- Flow cytometry

**Reported:**

- Results phoned within 48 hours. Written interpretive report sent within 7 days.

**Additional Information:**

- An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

- This test is generally only performed when results from the peroxidase stain performed in the Hematology section are negative or equivocal. This test is performed as part of the Leukemia/Lymphoma markers evaluation.

**CPT Codes:**

- 88346

**LDT or Modified FDA:**

- Yes

**LOINC Codes:**
Myositis Extended Panel
MYOPAN

ORDERING

Ordering Recommendations:
May be useful for differential evaluation of polymyositis, dermatomyositis, necrotizing autoimmune myopathy, or overlap syndromes associated with connective tissue disease.

Performing Lab:
ARUP

Performed:
Mon, Tue, Thu, Fri

Methodology:
Qualitative Immunoprecipitation/Semi-Quantitative Multiplex Bead Assay/Qualitative Immunoblot

Reported:
7-15 days

COLLECTION

Sample Type:
Serum

Collect:
Serum Separator Tube (SST).

Amount to Collect:
6 mL blood

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated specimens.

PROCESSING

Test Code:
MYOPAN

ARUP Test Code:
2013961

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer three 1 mL serum aliquots to ARUP Standard Transport Tubes. (Min: 0.5 mL/ aliquot)

Additional Processing Instructions:
Freeze aliquot. Transport aliquot frozen to CB. Order ARUP test code 2013961.

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
- Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated specimens.

Stability (from collection to initiation):
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
- Refrigerated.

RESULT INTERPRETATION

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSA 52 and 60 (Ro) (ENA) Antibodies, IgG</td>
<td>29 AU/mL or Less: Negative 30-40 AU/mL: Equivocal 41 AU/mL or greater: Positive</td>
</tr>
<tr>
<td>SSA-52 (Ro52) (ENA) Antibody, IgG</td>
<td></td>
</tr>
<tr>
<td>SSA-60 (Ro60) (ENA) Antibody, IgG</td>
<td></td>
</tr>
<tr>
<td>RNP (U1) (Ribonucleic Protein) (ENA) Antibody, IgG</td>
<td>29 AU/mL or less: Negative 30-40 AU/mL: Equivocal 41 AU/mL or greater: Positive</td>
</tr>
<tr>
<td>Jo-1 Antibody, IgG</td>
<td>29 AU/mL or less: Negative 30-40 AU/mL: Equivocal 41 AU/mL or greater: Positive</td>
</tr>
<tr>
<td>Mi-2 (nuclear helicase protein) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>PL-7 (threonyl-tRNA synthetase) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>PL-12 (alanyl-tRNA synthetase) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>P155/140 Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>EJ (glycyl-tRNA synthetase) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>Ku Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>U2 sn (small nuclear) RNP Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>SRP (Signal Recognition Particle) Ab</td>
<td>Negative</td>
</tr>
<tr>
<td>OJ (isoleucyl-tRNA synthetase) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>SAET (SUMO activating enzyme) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>MDA5 (CADM-140) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>NXP-2 (Nuclear matrix protein-2) Ab</td>
<td>Negative</td>
</tr>
<tr>
<td>TIF-1 gamma (155 kDa) Antibody</td>
<td>Negative</td>
</tr>
<tr>
<td>Fibrillarin (U3 RNP) Antibody, IgG (Temporary Delay as of 3/18/2019 - no referral available)</td>
<td>Negative</td>
</tr>
<tr>
<td>PM/Sci-100 Antibody, IgG by Immunoblot</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Interpretive Data:
Refer to report.

ADMINISTRATIVE

CPT Codes:
83516 x13; 86235 x6

COMPLETE VIEW
Ordering Recommendations:
May be useful for differential evaluation of polymyositis, dermatomyositis, necrotizing autoimmune myopathy, or overlap syndromes associated with connective tissue disease.

Test Code:
MYOPAN

ARUP Test Code:
2013961

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Mon, Tue, Thu, Fri

Methodology:
Qualitative Immunoprecipitation/Semi-Quantitative Multiplex Bead Assay/Qualitative Immunoblot

Collect:
Serum Separator Tube (SST).

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
3 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated specimens.

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer three 1 mL serum aliquots to ARUP Standard Transport Tubes. (Min: 0.5 mL/aliquot)

Additional Processing Instructions:
Freeze aliquot. Transport aliquot frozen to CB. Order ARUP test code 2013961.

Reference Interval:

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<tr>
<td>SSA 52 and 60 (Ro) (ENA) Antibodies, IgG</td>
<td>Components</td>
</tr>
<tr>
<td>SSA-52 (Ro52) (ENA) Antibody, IgG</td>
<td>29 AU/mL or less: Negative</td>
</tr>
<tr>
<td></td>
<td>30-40 AU/mL: Equivocal</td>
</tr>
<tr>
<td></td>
<td>41 AU/mL or greater: Positive</td>
</tr>
<tr>
<td>SSA-60 (Ro60) (ENA) Antibody, IgG</td>
<td>29 AU/mL or less: Negative</td>
</tr>
<tr>
<td></td>
<td>30-40 AU/mL: Equivocal</td>
</tr>
<tr>
<td></td>
<td>41 AU/mL or greater: Positive</td>
</tr>
<tr>
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<td>29 AU/mL or less: Negative</td>
</tr>
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<td>Negative</td>
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<td>Test Description</td>
<td>Result</td>
</tr>
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<td>---------</td>
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<td>PM/Scl-100 Antibody, IgG by Immunoblot</td>
<td>Negative</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
Refer to report.

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

**Reported:**
7-15 days

**CPT Codes:**
83516 x13; 86235 x6

**Notes:**
Antibodies: Mi-2, PL-7, PL12, P155/140, EJ, Ku, OJ, PM/Scl, SRP, U2RNP, U1RNP, Ro52, Ro60, Jo-1, U3 Fib, SAE1, NXP2, MDA5, TIF1-gamma

Printed 06/07/19
Test information subject to change
N-acetylaspartate quantitation
MOLT

ORDERING

Available Stat: No
Performing Lab: UC San Diego
Methodology: GC-MS
Reported: 7 days
Additional Information:
Gross elevations may be useful in the diagnosis of Canavan disease.

References:

COLLECTION

Sample Type:
Random urine w/out preservative
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout: Yes
Performing Lab: UC San Diego
Specimen Preparation:
Freeze at -20C and ship on dry ice
Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Additional Information:
Gross elevations may be useful in the diagnosis of Canavan disease.

References:

Available Stat: No
Test Code: MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Performing Lab: UC San Diego
Sendout: Yes
Methodology: GC-MS
Collect: Urine cup
Amount to Collect: See preferred volume
Sample Type: Random urine w/out preservative
Preferred Volume: 20 mL urine
Minimum Volume: 5 mL urine
Specimen Preparation: Freeze at -20C and ship on dry ice
Reported: 7 days
Additional Information: Gross elevations may be useful in the diagnosis of Canavan disease.

References:
Natural Killer Cells, Functional
NKCF

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: Flow Cytometry
Reported: 2-5 days
Additional Information: Natural killer cells (NK cells) are a subset of non-B, non-T peripheral blood lymphocytes that appear to play a crucial role in the human innate immune response. The function of NK cells is important for the clearance of tumor cells, for the removal of immunoglobulin-bound antigens, and for the control of viral infections. NK function has been reported to be decreased in certain individuals, including those with primary immunodeficiencies, those with late-stage human immunodeficiency virus infections, and pregnant women.

Synonyms:
- NK cells

COLLECTION

Sample Type:
Heparinized whole blood
Collect:
Dark Green top x2 (Light Green top unacceptable)
Amount to Collect:
10 mL blood
Preferred Volume:
10 mL blood
Minimum Volume:
5 mL blood
Remarks:
Maintain sample at ambient temperature. Fasting preferred to avoid lipemia.
Specimen must be received in the testing lab within 48 hours of collection. Collect Monday (before noon) through Thursday (before noon) only.

Stability (from collection to initiation):
Room temperature 2 days,

Unacceptable Conditions:
- Hemolyzed, clotted or lipemic samples

Rejection Criteria:
- Hemolyzed, clotted or lipemic samples

PROCESSING

Test Code: NKCF
Sendout: Yes
Performing Lab: Focus via Quest
Specimen Preparation:
Specimen must be shipped same day as collection. Do not refrigerate or freeze
Preferred Volume:
10 mL blood

Minimum Volume:
5 mL blood

Unacceptable Conditions:
Hemolyzed, clotted or lipemic samples

Rejection Criteria:
Hemolyzed, clotted or lipemic samples

Stability (from collection to initiation):
Room temperature 2 days,

RESULT INTERPRETATION

Units:
LU30

Reference Interval:
7-125 LU30

Additional Information:
Natural killer cells (NK cells) are a subset of non-B, non-T peripheral blood lymphocytes that appear to play a crucial role in the human innate immune response. The function of NK cells is important for the clearance of tumor cells, for the removal of immunoglobulin-bound antigens, and for the control of viral infections. NK function has been reported to be decreased in certain individuals, including those with primary immunodeficiencies, those with late-stage human immunodeficiency virus infections, and pregnant women.

ADMINISTRATIVE

CPT Codes:
88184-90, 88185-90 x2

COMPLETE VIEW

Available Stat:
No

Test Code:
NKCF

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Flow Cytometry

Remarks:
Maintain sample at ambient temperature. Fasting preferred to avoid lipemia.

Specimen must be received in the testing lab within 48 hours of collection. Collect Monday (before noon) through Thursday (before noon) only.

Collect:
Dark Green top x2 (Light Green top unacceptable)

Amount to Collect:
10 mL blood

Sample Type:
Heparinized whole blood

Preferred Volume:
10 mL blood

Minimum Volume:
5 mL blood
Rejection Criteria:
- Hemolyzed, clotted or lipemic samples

Unacceptable Conditions:
- Hemolyzed, clotted or lipemic samples

Specimen Preparation:
- Specimen must be shipped same day as collection. Do not refrigerate or freeze

Units:
- LU30

Reference Interval:
- 7-125 LU30

Synonyms:
- NK cells

Stability (from collection to initiation):
- Room temperature 2 days,

Reported:
- 2-5 days

Additional Information:
Natural killer cells (NK cells) are a subset of non-B, non-T peripheral blood lymphocytes that appear to play a crucial role in the human innate immune response. The function of NK cells is important for the clearance of tumor cells, for the removal of immunoglobulin-bound antigens, and for the control of viral infections. NK function has been reported to be decreased in certain individuals, including those with primary immunodeficiencies, those with late-stage human immunodeficiency virus infections, and pregnant women.

CPT Codes:
- 88184-90, 88185-90 x2
Neisseria gonorrhoeae Culture
P128

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Daily, all shifts
Methodology:
Culture
Reported:
Up to 3 days
Additional Information:
Gram stain is performed on specimens other than endocervical, vaginal, rectal, and throat, and is billed separately.

Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Neisseria gonorrhoeae can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

Synonyms:
- Bacterial culture
- N. gonorrhoeae
- Neisseria gonorrhoeae
- STD
- Sexually transmitted disease

COLLECTION

Sample Type:
Swab of genital, rectal, throat, and other sites
Collect:
Swab in Amies transport medium with charcoal
Remarks:
**Male urethra:** Use a wire swab. Insert the swab and twirl it gently for a few seconds. Place swab in Amies transport medium with charcoal.

**Other sites:** Use the swab supplied in the Amies transport medium with charcoal collection kit. For cervical or rectal samples insert the swab and twirl it gently for a few seconds. Swab throat for throat specimens.

Specimens should be held at room temperature and transported to the laboratory for inoculation within 6 hours of collection.

**Stability (from collection to initiation):**
6 hours in appropriate transport media. Samples received 6-12 hours after collection may be compromised.

**Unacceptable Conditions:**
Refrigerated samples, samples delivered to lab >12 hours after collection, swabs not received in Amies transport medium with charcoal

PROCESSING

Test Code:
P128
Test Group:
Gonococcus
Performing Lab:
Microbiology

Specimen Preparation:
Maintain sample at room temperature

Unacceptable Conditions:
Refrigerated samples, samples delivered to lab >12 hours after collection, swabs not received in Amies transport medium with charcoal

Stability (from collection to initiation):
6 hours in appropriate transport media. Samples received 6-12 hours after collection may be compromised.

RESULT INTERPRETATION

Reference Interval:
No Neisseria gonorrhoeae isolated

Critical Values:
Positive culture from sterile sites only

Additional Information:
Gram stain is performed on specimens other than endocervical, vaginal, rectal, and throat, and is billed separately.

Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Neisseria gonorrhoeae can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

ADMINISTRATIVE

CPT Codes:
87081, 87205 (gram stain)

LOINC Codes:
698-1

COMPLETE VIEW

Available Stat:
No

Test Code:
P128

Test Group:
Gonococcus

Performing Lab:
Microbiology

Performed:
Daily, all shifts

Methodology:
Culture

Remarks:

Male urethra: Use a wire swab. Insert the swab and twirl it gently for a few seconds. Place swab in Amies transport medium with charcoal.

Other sites: Use the swab supplied in the Amies transport medium with charcoal collection kit. For cervical or rectal samples insert the swab and twirl it gently for a few seconds. Swab throat for throat specimens.

Specimens should be held at room temperature and transported to the laboratory for inoculation within 6 hours of collection.

Collect:
Swab in Amies transport medium with charcoal

Sample Type:
Swab of genital, rectal, throat, and other sites
Unacceptable Conditions:
Refrigerated samples, samples delivered to lab >12 hours after collection, swabs not received in Amies transport medium with charcoal

Specimen Preparation:
Maintain sample at room temperature

Reference Interval:
No Neisseria gonorrhoeae isolated

Critical Values:
Positive culture from sterile sites only

Synonyms:
- Bacterial culture
- N. gonorrheae
- Neisseria gonorrhoeae
- STD
- Sexually transmitted disease

Stability (from collection to initiation):
6 hours in appropriate transport media. Samples received 6-12 hours after collection may be compromised.

Reported:
Up to 3 days

Additional Information:
Gram stain is performed on specimens other than endocervical, vaginal, rectal, and throat, and is billed separately.

Nucleic acid detection is a sensitive method for diagnosis of CT / NG infections and is the recommended method for most patients. Culture for Neisseria gonorrhoeae can be ordered to assess clinical treatment failure (where DNA may persist post-treatment), cases of suspected sexual abuse, or for sample types other than cervical, urethral, rectal, pharyngeal, vaginal and urine (e.g. eye swab, tissue, extra-genital infection sites).

CPT Codes:
87081, 87205 (gram stain)

LOINC Codes:
698-1
Neonatal Alloimmune Thrombocytopenia - Parental evaluation
MOLT

**ORDERING**

Available Stat:
- No

Performing Lab:
- Versiti via Blood Center of Wisconsin

Methodology:
- ELISA, Flow cytometry, PCR

Reported:
- 1-2 weeks

Additional Information:
Mothers with normal platelet counts may deliver a baby with low platelet counts. There is a possibility of neonatal alloimmune thrombocytopenia (NATP) in which the mother lacks a platelet antigen that the baby inherits from the father. A maternal antibody is formed against the father’s platelet antigen that crosses the placenta and causes the fetus to be thrombocytopenic.

About 50% of maternal alloimmunization arises due to the mother being among the 2% of the general population whose platelets lack the common PlA1 antigen; another 30% of alloimmunization involves the Bak and Pen antigens (common in Asia), or other antigen systems.

If evidence of maternal alloimmunization is found, further evaluation may be appropriate to evaluate the risk and permit prophylaxis for neonatal alloimmune thrombocytopenic purpura in future pregnancies.

**Synonyms:**
- NAIT
- anti-platelet antibodies
- platelet specific antibodies
- PlA1
- Bak
- Pen
- NAT
- NATP
- flow cytometry

**COLLECTION**

Sample Type:
- ACD whole blood AND Serum

Collect:
- Mother: Yellow top (ACD) x3 and Red top x3
- Father: Yellow top (ACD) x3

Amount to Collect:
- See preferred volume

Preferred Volume:
- Mother: 30 ml ACD-A whole blood AND 10 ML serum
- Father: 30 ml ACD-A whole blood

Minimum Volume:
- Mother: 25.5 mL ACD whole blood and 10 mL serum
- Father: 25.5 mL ACD whole blood

Remarks:
- Specimens are only accepted 8 AM-5 PM Monday through Thursday and 8 AM-12 Noon on Friday.

- Provider must fill out the outside lab (BCW) requisition form.
Submit form, APEX MOLT order requisition and specimen to Central Processing

Unacceptable Conditions:
Samples collected outside of stated time frames.

Rejection Criteria:
Sample > 4 days old when received

PROCESSING

Test Code:
MOLT

Test Group:
Neonatal Alloimmune Thrombocytopenia

Sendout:
Yes

Performing Lab:
Versiti via Blood Center of Wisconsin

Specimen Preparation:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing

Store refrigerated. Send samples refrigerated. Samples must be received within 4 days of draw date.

Preferred Volume:
Mother: 30 ml ACD-A whole blood AND 10 ML serum
Father: 30 ml ACD-A whole blood

Minimum Volume:
Mother: 25.5 mL ACD whole blood and 10 mL serum
Father: 25.5 mL ACD whole blood

Unacceptable Conditions:
Samples collected outside of stated time frames.

Rejection Criteria:
Sample > 4 days old when received

RESULT INTERPRETATION

Additional Information:
Mothers with normal platelet counts may deliver a baby with low platelet counts. There is a possibility of neonatal alloimmune thrombocytopenia (NATP) in which the mother lacks a platelet antigen that the baby inherits from the father. A maternal antibody is formed against the father’s platelet antigen that crosses the placenta and causes the fetus to be thrombocytopenic.

About 50% of maternal alloimmunization arises due to the mother being among the 2% of the general population whose platelets lack the common PlA1 antigen; another 30% of alloimmunization involves the Bak and Pen antigens (common in Asia), or other antigen systems.

If evidence of maternal alloimmunization is found, further evaluation may be appropriate to evaluate the risk and permit prophylaxis for neonatal alloimmune thrombocytopenic purpura in future pregnancies.

ADMINISTRATIVE

CPT Codes:
83891-90 x2, 83900-90 x2, 83901-90 x10, 83912-90 x2, 83896-90 x36, 86022-90 x16
Available Stat:  
No

Test Code:  
MOLT

Test Group:  
Neonatal Alloimmune Thrombocytopenia

Performing Lab:  
Versiti via Blood Center of Wisconsin

Sendout:  
Yes

Methodology:  
ELISA, Flow cytometry, PCR

Remarks:  
Specimens are only accepted 8 AM-5 PM Monday through Thursday and 8 AM-12 Noon on Friday.

Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing

Collect:  
Mother: Yellow top (ACD) x3 and Red top x3
Father: Yellow top (ACD) x3

Amount to Collect:  
See preferred volume

Sample Type:  
ACD whole blood AND Serum

Preferred Volume:  
Mother: 30 ml ACD-A whole blood AND 10 ML serum
Father: 30 ml ACD-A whole blood

Minimum Volume:  
Mother: 25.5 mL ACD whole blood and 10 mL serum
Father: 25.5 mL ACD whole blood

Rejection Criteria:  
Sample > 4 days old when received

Unacceptable Conditions:  
Samples collected outside of stated time frames.

Specimen Preparation:  
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimen to Central Processing

Store refrigerated. Send samples refrigerated. Samples must be received within 4 days of draw date.

Synonyms:  
- NAIT
- anti-platelet antibodies
- platelet specific antibodies
- PlA1
- Bak
- Pen
- NAT
• NATP
• flow cytometry

Reported:
1-2 weeks

Additional Information:

Mothers with normal platelet counts may deliver a baby with low platelet counts. There is a possibility of neonatal alloimmune thrombocytopenia (NATP) in which the mother lacks a platelet antigen that the baby inherits from the father. A maternal antibody is formed against the father’s platelet antigen that crosses the placenta and causes the fetus to be thrombocytopenic.

About 50% of maternal alloimmunization arises due to the mother being among the 2% of the general population whose platelets lack the common PlA1 antigen; another 30% of alloimmunization involves the Bak and Pen antigens (common in Asia), or other antigen systems.

If evidence of maternal alloimmunization is found, further evaluation may be appropriate to evaluate the risk and permit prophylaxis for neonatal alloimmune thrombocytopenic purpura in future pregnancies.

CPT Codes:
83891-90 x2, 83900-90 x2, 83901-90 x10, 83912-90 x2, 83896-90 x36, 86022-90 x16
Neonatal Alloimmune Thrombocytopenia-Fetal evaluation
MOLT

ORDERING

Approval Required:

REQUIRES PATIENT INSURANCE INFORMATION AND AUTHORIZATION FROM HEALTH INSURANCE PROVIDER BEFORE COLLECTION OF SAMPLES. Contact Send Outs Section of the Clinical Lab 3-1349.

As test methodology and requirements are undergoing changes, provider should first confirm sample requirements with Versiti Lab and also contact UCSF cytogenetics laboratory to coordinate sample collection and expansion. Provider should complete the Versiti Platelet and Neutrophil Immunology Lab requisition and order the appropriate test. Provider should place a Miscellaneous Outside Laboratory Test (MOLT) order in APEX.

Available Stat:

No

Performing Lab:

Versiti Platelet and Neutrophil Immunology Laboratory, Wisconsin

Methodology:

PCR

Reported:

1 week

Synonyms:

• Fetal platelet antigen genotyping
• NAIT
• anti-platelet antibodies
• platelet specific antibodies
• PlA1
• Bak
• Pen
• NAT
• NATP

COLLECTION

Sample Type:

Fetal: Amniotic Fluid, CVS, Cultured Amniocytes or Cultured CVS

Collect:

Orange top polypropylene x2

Amount to Collect:

Please confirm sample requirements with Versiti Lab before proceeding:

30 mL amniotic fluid. Discard first 2 mL of fluid. Sample should be collected in two 15 ml. orange screw top polypropylene tubes (less if early amniocentesis). If the sample is grossly bloody, the results may be inconclusive and a repeat sample will be requested.

Preferred Volume:

7-15 ml Amniotic Fluid or 5-10 mg CVS, backup culture of Amniocytes or CVS is highly recommended; Two T25 flasks Cultured Amniocytes or CVS (5x10e6 minimum)

Minimum Volume:

Call Versiti Laboratory

Remarks:

See information under "Approval Required" BEFORE collecting sample

Specimens are only accepted 8 AM-5 PM Monday through Thursday and 8 AM-12 Noon on Friday.

Provider must fill out the Versiti requisition form.
Submit form, APEX "MOLT" order requisition and specimen to Central Processing

**Stability (from collection to initiation):**
24 hrs from time media is added to cell culture.

### PROCESSING

**Test Code:**
- MOLT

**Test Group:**
- Platelet Antigen Genotyping

**Sendout:**
- Yes

**Performing Lab:**
- Versiti Platelet and Neutrophil Immunology Laboratory, Wisconsin

**Specimen Preparation:**
Please confirm sample requirements with Versiti Lab:

Keep samples at room temperature. DO NOT CENTRIFUGE for any reason.
Send all tubes and completed paperwork immediately to the Cytogenetics Laboratory at China Basin. Cytogenetics Laboratory will expand amniocytes to two T25 flasks and arrange shipping to Versiti (previously known as Blood Center of Wisconsin) through the send out department at China Basin. A minimum of 5 x 10e6 cultured amniotic cells are required.

Shipping instructions: Please confirm with Versiti Lab:

Cultured cells: Media should be added to the flasks by Cytogenetics, sealed to avoid leakage and shipped at room temperature or refrigerated.

Package specimens and ship at room temperature by Federal Express Monday - Thursday only.

All samples should reach Versiti within 24 hours of addition of media and no later than 1 pm on Friday. Mark box with Keep at Room Temperature and UP arrows to indicate the box must be maintained upright during shipment. Mark OVERNIGHT on Federal Express form.

**Shipping Address:**
- Versiti Wisconsin - Platelet & Neutrophil Laboratory
  - 638 North 18th Street
  - Milwaukee, WI 532332121

Please call the laboratory (800-245-3117 extension 6255) for advice if you plan to ship samples near a major holiday.

**Preferred Volume:**
- 7-15 ml Amniotic Fluid or 5-10 mg CVS, backup culture of Amniocytes or CVS is highly recommended; Two T25 flasks Cultured Amniocytes or CVS (5x10e6 minimum)

**Minimum Volume:**
- Call Versiti Laboratory

**Stability (from collection to initiation):**
24 hrs from time media is added to cell culture.

### ADMINISTRATIVE

**CPT Codes:**
Genotyping panel: 81105, 81106, 81107, 81108, 81109, 81110, 81111, 81112

Individual antigen systems:
- HPA-1: 81105
- HPA-2: 81106
- HPA-3: 81107
- HPA-4: 81108
Approval Required:

REQUIRES PATIENT INSURANCE INFORMATION AND AUTHORIZATION FROM HEALTH INSURANCE PROVIDER BEFORE COLLECTION OF SAMPLES. Contact Send Outs Section of the Clinical Lab 3-1349.

As test methodology and requirements are undergoing changes, provider should first confirm sample requirements with Versiti Lab and also contact UCSF cytogenetics laboratory to coordinate sample collection and expansion. Provider should complete the Versiti Platelet and Neutrophil Immunology Lab requisition and order the appropriate test. Provider should place a Miscellaneous Outside Laboratory Test (MOLT) order in APEX.

Available Stat: No

Test Code: MOLT

Test Group: Platelet Antigen Genotyping

Performing Lab: Versiti Platelet and Neutrophil Immunology Laboratory, Wisconsin

Sendout: Yes

Methodology: PCR

Remarks:
See information under "Approval Required" BEFORE collecting sample

Specimens are only accepted 8 AM-5 PM Monday through Thursday and 8 AM-12 Noon on Friday.

Provider must fill out the Versiti requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX "MOLT" order requisition and specimen to Central Processing

Collect:
Orange top polypropylene x2

Amount to Collect:
Please confirm sample requirements with Versiti Lab before proceeding:

30 mL amniotic fluid. Discard first 2 mL of fluid. Sample should be collected in two 15 ml. orange screw top polypropylene tubes (less if early amniocentesis). If the sample is grossly bloody, the results may be inconclusive and a repeat sample will be requested.

Sample Type:
Fetal: Amniotic Fluid, CVS, Cultured Amniocytes or Cultured CVS

Preferred Volume:
7-15 ml Amniotic Fluid or 5-10 mg CVS, backup culture of Amniocytes or CVS is highly recommended; Two T25 flasks Cultured Amniocytes or CVS (5x10e6 minimum)

Minimum Volume:
Call Versiti Laboratory

Specimen Preparation:
Please confirm sample requirements with Versiti Lab:

Keep samples at room temperature. DO NOT CENTRIFUGE for any reason.
Send all tubes and completed paperwork immediately to the Cytogenetics Laboratory at China Basin. Cytogenetics Laboratory will expand amniocytes to two T25 flasks and arrange shipping to Versiti (previously known as Blood Center of Wisconsin) through the send out department at China Basin. A minimum of 5 x 10e6 cultured amniotic cells are required.
Shipping instructions: Please confirm with Versiti Lab:

Cultured cells: Media should be added to the flasks by Cytogenetics, sealed to avoid leakage and shipped at room temperature or refrigerated.

Package specimens and ship at room temperature by Federal Express Monday - Thursday only.

All samples should reach Versiti within 24 hours of addition of media and no later than 1 pm on Friday. Mark box with Keep at Room Temperature and UP arrows to indicate the box must be maintained upright during shipment. Mark OVERNIGHT on Federal Express form.

Shipping Address:
Versiti Wisconsin - Platelet & Neutrophil Laboratory
638 North 18th Street
Milwaukee, WI 532332121

Please call the laboratory (800-245-3117 extension 6255) for advice if you plan to ship samples near a major holiday.

Synonyms:
- Fetal platelet antigen genotyping
- NAIT
- anti-platelet antibodies
- platelet specific antibodies
- PlA1
- Bak
- Pen
- NAT
- NATP

Stability (from collection to initiation):
24 hrs from time media is added to cell culture.

Reported:
1 week

CPT Codes:
Genotyping panel: 81105, 81106, 81107, 81108, 81109, 81110, 81111, 81112

Individual antigen systems:
HPA-1: 81105
HPA-2: 81106
HPA-3: 81107
HPA-4: 81108
HPA-5: 81109
HPA-6: 81110
HPA-9: 81111
HPA-15: 81112
Neonatal Drug Screen, Meconium
ABUSM

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Immunoassay, GC/MS
Reported: 4 - 5 days

Additional Information:
Strategies to improve the detection and treatment of substance abuse during pregnancy are the focus of growing interest to those involved in perinatal care. Meconium is an effective biological marker of in-utero illicit drug exposure, and can provide insights leading to improved neonatal outcomes, as well as provide evidence to ensure appropriate rehabilitation of mothers suffering from addiction.

Synonyms:
• Drugs of abuse

COLLECTION

Sample Type: Meconium
Collect: Leak proof container
Amount to Collect: 5 gm meconium
Preferred Volume: 5 gm
Minimum Volume: 1 gm

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen 1 month.

PROCESSING

Test Code: ABUSM
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: DO not aliquot. Freeze sample and transport to China Basin frozen. Order Quest test code 30427X
Preferred Volume: 5 gm
Minimum Volume: 1 gm

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 1 week, frozen 1 month.

RESULT INTERPRETATION
Additional Information:

Strategies to improve the detection and treatment of substance abuse during pregnancy are the focus of growing interest to those involved in perinatal care. Meconium is an effective biological marker of in-utero illicit drug exposure, and can provide insights leading to improved neonatal outcomes, as well as provide evidence to ensure appropriate rehabilitation of mothers suffering from addiction.

ADMINISTRATIVE

CPT Codes:

80310-90

COMPLETE VIEW

Available Stat:

No

Test Code:

ABUSM

Performing Lab:

Quest

Sendout:

Yes

Methodology:

Immonoassay, GC/MS

Collect:

Leak proof container

Amount to Collect:

5 gm meconium

Sample Type:

Meconium

Preferred Volume:

5 gm

Minimum Volume:

1 gm

Specimen Preparation:

DO not aliquot. Freeze sample and transport to China Basin frozen. Order Quest test code 30427X

Synonyms:

- Drugs of abuse

Stability (from collection to initiation):

Room temperature 2 days, refrigerated 1 week, frozen 1 month.

Reported:

4 - 5 days

Additional Information:

Strategies to improve the detection and treatment of substance abuse during pregnancy are the focus of growing interest to those involved in perinatal care. Meconium is an effective biological marker of in-utero illicit drug exposure, and can provide insights leading to improved neonatal outcomes, as well as provide evidence to ensure appropriate rehabilitation of mothers suffering from addiction.

CPT Codes:

80310-90
Neonatal Screen
NNEO

ORDERING

Available Stat:
No

Performing Lab:
Provided through the California Department of Public Health

Reported:
9-12 days

Additional Information:
A Newborn Screening Specimen Collection Form must be completed by the ordering provider prior to specimen collection. For information on how to obtain these forms from CADPH please click here.

For information regarding the specific disorders detectable by newborn screening please click here.

IF AN ABNORMALITY IS DETECTED There is no direct patient charge for a neonate recalled by the state Screening Program or for the parents; contact the Newborn Screening Area Service Center for the San Francisco region at Stanford University Medical Center (650) 812-0353 for instructions. If this patient is being followed at UCSF, contact the Genetics Counselor for the Biochemical Genetics Service, x69997. Beeper Monday-Friday 8-5 PM 719-6813 or the Genetics Fellow on-call evening/weekends 719-9075.

Synonyms:
- Cord blood
- newborn screen
- state screening
- Guthrie spots
- NBS

COLLECTION

Sample Type:
Blood

Collect:
Filter paper

Preferred Volume:
5 completely filled blood spots

Recommend that one full EDTA (Lavender top) vacutainer of cord blood be submitted to be held by the blood bank should further testing be required.

Remarks:
A Newborn Screening Specimen Collection Form must be completed by the ordering provider prior to specimen collection. For information on how to obtain these forms from CADPH please click here.

Draw > 12 hours after birth or immediately prior to an earlier blood transfusion.

Do not use capillary tubes for collection of the blood spot specimen and do not collect from a site other than a heel stick: deviations from the standard collection method of direct spotting of heel stick blood onto the filter paper can give false-negative results.

It is advised to submit a sample of cord blood in a Lavender top tube (label it "NSP") to the blood bank for follow-up hemoglobinopathy testing if required.

PROCESSING

Test Code:
NNEO

Sendout:
Performing Lab:
Provided through the California Department of Public Health

Specimen Preparation:
1. Complete the Specimen Transport Log
2. Place samples and the completed Specimen Transport Log into a GSO or large manilla envelope
3. Apply shipping label
   - Monday - Thursday: Use label marked PDS
   - Friday: Use label marked SDS
4. Peel off the GSO tracking label at the bottom of the shipping label and place on a copy of the Specimen Transport Log for our records. Specimens may be tracked at www.gso.com
5. Place envelope in M503 by 1630 hours for pickup
6. send copy of the Specimen Transport Log to CB send-outs "Attn: Maxi Cruz"

Preferred Volume:
5 completely filled blood spots

Recommend that one full EDTA (Lavender top) vacutainer of cord blood be submitted to be held by the blood bank should further testing be required.

RESULT INTERPRETATION

Units:
See normals

Reference Interval:

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<thead>
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<th>Acylcarnitine profile:</th>
<th>Units</th>
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<td>12-220 µmol/L</td>
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<td>FC/(C16+C18) ratio</td>
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</tr>
<tr>
<td>C-2</td>
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<tr>
<td>C-3</td>
<td>0-6.5 µmol/L</td>
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<td>CO3/CO2 ratio</td>
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<td>C-3DC</td>
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<td>C-4</td>
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<td>C-4DC</td>
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<td>C-5</td>
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<td>C-5DC</td>
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<td>C-10</td>
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<td>C10:1</td>
<td>0-0.45 µmol/L</td>
</tr>
<tr>
<td>C-12</td>
<td>0-2 µmol/L</td>
</tr>
<tr>
<td>C-12:1</td>
<td>Not given</td>
</tr>
<tr>
<td>C-14</td>
<td>0-1.1 µmol/L</td>
</tr>
<tr>
<td>C14:1</td>
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</tr>
<tr>
<td>C14:1/C12:1 ratio</td>
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</tr>
<tr>
<td>C-14OH</td>
<td>0-0.4 µmol/L</td>
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<tr>
<td>C-16</td>
<td>0-10 µmol/L</td>
</tr>
<tr>
<td>C-16:1</td>
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<td>C-16OH</td>
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</tr>
<tr>
<td>C-18</td>
<td>0-3.5 µmol/L</td>
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<tr>
<td>C-18:1</td>
<td>0-4 µmol/L</td>
</tr>
<tr>
<td>C-18:2</td>
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</tr>
<tr>
<td>C-18OH</td>
<td>0-0.4 µmol/L</td>
</tr>
<tr>
<td>C18:1OH</td>
<td>0-0.35 µmol/L</td>
</tr>
</tbody>
</table>

Amino acids:
Glycine Not given
Alanine 0-900 µmol/L
Valine Not given
Leucine/Isoleucine 0-200 µmol/L
Leucine/Alanine ratio 0-1.5
Phenylalanine 0-140 µmol/L
Phenylalanine/Tyrosine ratio 0-2.3
Tyrosine 0-700 µmol/L
Methionine 0-100 µmol/L
Citrrulline 0-90 µmol/L
Citrrulline/Arginine ratio Not given
Ornithine 0-500 µmol/L
Ornithine/Citrrulline ratio Not given
Arginine 0-200 µmol/L
Arginine/Ornithine ratio Not given
Proline 0-100 µmol/L
5-Oxoproline Not given

Other analytes:
Immunoreactive trypsinogen <62 ng/mL
Biotinidase >10 ERU
Gal-1-Uridyl Transferase >50 enzyme units
TSH 0-25 mIU/L
17 Hydroxyprogesterone <180 nmol/L
T-cell Receptor Excision Circle (TREC) >25 copies/µL

Additional Information:

A Newborn Screening Specimen Collection Form must be completed by the ordering provider prior to specimen collection. For information on how to obtain these forms from CADPH please click here.

For information regarding the specific disorders detectable by newborn screening please click here.

IF AN ABNORMALITY IS DETECTED There is no direct patient charge for a neonate recalled by the state Screening Program or for the parents; contact the Newborn Screening Area Service Center for the San Francisco region at Stanford University Medical Center (650) 812-0353 for instructions. If this patient is being followed at UCSF, contact the Genetics Counselor for the Biochemical Genetics Service, x69997. Beeper Monday-Friday 8-5 PM 719-6813 or the Genetics Fellow on-call evening/weekends 719-9075.

ADMINISTRATIVE

CPT Codes:
82776-90, 84443-90, 83021-90, 83498-90, 83789-90, 83516-90, 82261-90

LOINC Codes:
54089-8

COMPLETE VIEW

Available Stat:
No

Test Code:
NNEO

Performing Lab:
Provided through the California Department of Public Health

Sendout:
Yes

Remarks:

A Newborn Screening Specimen Collection Form must be completed by the ordering provider prior to specimen collection. For information on how to obtain these forms from CADPH please click here.

Draw > 12 hours after birth or immediately prior to an earlier blood transfusion.
Do not use capillary tubes for collection of the blood spot specimen and do not collect from a site other than a heel stick: deviations from the standard collection method of direct spotting of heel stick blood onto the filter paper can give false-negative results.

It is advised to submit a sample of cord blood in a Lavender top tube (label it "NSP") to the blood bank for follow-up hemoglobinopathy testing if required.

Collect:
- Filter paper

Sample Type:
- Blood

Preferred Volume:
- 5 completely filled blood spots

Recommend that one full EDTA (Lavender top) vacutainer of cord blood be submitted to be held by the blood bank should further testing be required.

Specimen Preparation:
1. Complete the Specimen Transport Log
2. Place samples and the completed Specimen Transport Log into a GSO or large manilla envelope
3. Apply shipping label
   - Monday - Thursday: Use label marked PDS
   - Friday: Use label marked SDS
4. Peel off the GSO tracking label at the bottom of the shipping label and place on a copy of the Specimen Transport Log for our records. Specimens may be tracked at www.gso.com
5. Place envelope in M503 by 1630 hours for pickup
6. send copy of the Specimen Transport Log to CB send-outs "Attn: Maxi Cruz"

Units:
- See normals

Reference Interval:

<table>
<thead>
<tr>
<th>Acylcarnitine profile:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC</td>
</tr>
<tr>
<td>FC/(C16+C18) ratio</td>
</tr>
<tr>
<td>C-2</td>
</tr>
<tr>
<td>C-3</td>
</tr>
<tr>
<td>CO3/CO2 ratio</td>
</tr>
<tr>
<td>C-3DC</td>
</tr>
<tr>
<td>C-4</td>
</tr>
<tr>
<td>C-4DC</td>
</tr>
<tr>
<td>C-5</td>
</tr>
<tr>
<td>C5:1</td>
</tr>
<tr>
<td>C-5OH</td>
</tr>
<tr>
<td>C-5DC</td>
</tr>
<tr>
<td>C-6</td>
</tr>
<tr>
<td>C-8</td>
</tr>
<tr>
<td>CO8/C10 ratio</td>
</tr>
<tr>
<td>C-8.1</td>
</tr>
<tr>
<td>C-10</td>
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<tr>
<td>C10:1</td>
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<tr>
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<tr>
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<tr>
<td>C-14</td>
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<tr>
<td>C14:1</td>
</tr>
<tr>
<td>C14:1/C12:1 ratio</td>
</tr>
<tr>
<td>C-14OH</td>
</tr>
<tr>
<td>C-16</td>
</tr>
<tr>
<td>C-16:1</td>
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<tr>
<td>C-16OH</td>
</tr>
<tr>
<td>C-18</td>
</tr>
<tr>
<td>C-18:1</td>
</tr>
<tr>
<td>C-18:2</td>
</tr>
<tr>
<td>C-18OH</td>
</tr>
<tr>
<td>C18:1OH</td>
</tr>
</tbody>
</table>
Amino acids:
- Glycine: Not given
- Alanine: 0-900 µmol/L
- Valine: Not given
- Leucine/Isoleucine: 0-200 µmol/L
- Leucine/Alanine ratio: 0-1.5
- Phenylalanine: 0-140 µmol/L
- Phenylalanine/Tyrosine ratio: 0-2.3
- Tyrosine: 0-700 µmol/L
- Methionine: 0-100 µmol/L
- Citrulline: 0-90 µmol/L
- Citrulline/Arginine ratio: Not given
- Ornithine: 0-500 µmol/L
- Ornithine/Citrulline ratio: Not given
- Arginine: 0-200 µmol/L
- Arginine/Ornithine ratio: Not given
- Proline: 0-100 µmol/L
- 5-Oxoproline: Not given

Other analytes:
- Immunoreactive trypsinogen: <62 ng/mL
- Biotinidase: >10 ERU
- Gal-1-Urdyl Transferase: >50 enzyme units
- TSH: 0-25 mIU/L
- 17 Hydroxyprogesterone: <180 nmol/L
- T-cell Receptor Excision Circle (TREC): >25 copies/µL

Synonyms:
- Cord blood
- newborn screen
- state screening
- Guthrie spots
- NBS

Reported:
- 9-12 days

Additional Information:
A Newborn Screening Specimen Collection Form must be completed by the ordering provider prior to specimen collection. For information on how to obtain these forms from CADPH please click here.

For information regarding the specific disorders detectable by newborn screening please click here.

IF AN ABNORMALITY IS DETECTED There is no direct patient charge for a neonate recalled by the state Screening Program or for the parents; contact the Newborn Screening Area Service Center for the San Francisco region at Stanford University Medical Center (650) 812-0353 for instructions. If this patient is being followed at UCSF, contact the Genetics Counselor for the Biochemical Genetics Service, x69997. Beeper Monday-Friday 8-5 PM 719-6813 or the Genetics Fellow on-call evening/weekends 719-9075.

CPT Codes:
- 82776-90, 84443-90, 83021-90, 83498-90, 83789-90, 83516-90, 82261-90

LOINC Codes:
- 54089-8
Neuron Specific Enolase, CSF
NSECSF

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Immonochemiluminometric assay
Reported:
Performed 2x per week. Turnaround 5-7 days
Synonyms:
• NSE

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
0.5 mL CSF
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.1 mL CSF

PROCESSING

Test Code:
NSECSF
Test Group:
Neuron Specific Enolase
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Non-B&T patients: Refrigerate CSF. Order Mayo test #81796.

B&T patients: Freeze CSF. Order LabCorp #829032
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.1 mL CSF

RESULT INTERPRETATION

Units:
ng/mL
Reference Interval:
Normal: < 20 ng/mL
Mildly elevated: 20-35 ng/mL
Indicative of CJD: > 35 ng/ml

**ADMINISTRATIVE**

CPT Codes:
- 83520-90

LOINC Codes:
- 44802-7

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- NSECSF

Test Group:
- Neuron Specific Enolase

Performing Lab:
- Mayo

Sendout:
- Yes

Methodology:
- Immunochemiluminometric assay

Collect:
- CSF tube or sterile collection tube

Amount to Collect:
- 0.5 mL CSF

Sample Type:
- CSF

Preferred Volume:
- 0.5 mL CSF

Minimum Volume:
- 0.1 mL CSF

Specimen Preparation:
- **Non-B&T patients:** Refrigerate CSF. Order Mayo test #81796.
- **B&T patients:** Freeze CSF. Order LabCorp #829032

Units:
- ng/mL

Reference Interval:
- Normal: < 20 ng/mL
- Mildly elevated: 20-35 ng/mL
- Indicative of CJD: > 35 ng/ml

Synonyms:
- NSE

Reported:
- Performed 2x per week. Turnaround 5-7 days

CPT Codes:
- 83520-90

LOINC Codes:
- 44802-7
**Neuron Specific Enolase, serum**

**NSE**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
EIA

**Reported:**
Performed 2x per week Turnaround time 3-6 days.

**Additional Information:**
Neuron Specific Enolase cannot be used as a diagnostic test without confirmation by another established test or procedure. Values obtained by different laboratories are generally not comparable. This test is performed using the Can Ag. EIA method.

Test is useful in monitoring disease progression and therapy in patients with small cell lung cancer and neuroendocrine tumors Neuroblastoma, Medullary Thyroid Ca, Pheochromocytoma and other malignancies that can secrete NSE such as Pancreatic Islet Cell Cancer

**Synonyms:**
- NSE

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
Hemolysis, or plasma sample.

**PROCESSING**

**Test Code:**
NSE

**Test Group:**
Neuron Specific Enolase

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Order Quest Test # 22251P

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum
**RESULT INTERPRETATION**

**Units:**
µg/L (mcg/L)

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>4.8-19.5 µg/L</td>
</tr>
<tr>
<td>12-17 years</td>
<td>&lt;= 12.0 µg/L</td>
</tr>
<tr>
<td>&gt;= 18 year olds</td>
<td>&lt;8.6 µg/L</td>
</tr>
</tbody>
</table>

**Additional Information:**
Neuron Specific Enolase cannot be used as a diagnostic test without confirmation by another established test or procedure. Values obtained by different laboratories are generally not comparable. This test is performed using the Can Ag. EIA method.

Test is useful in monitoring disease progression and therapy in patients with small cell lung cancer and neuroendocrine tumors Neuroblastoma, Medullary Thyroid Ca, Pheochromocytoma and other malignancies that can secrete NSE such as Pancreatic Islet Cell Cancer

**ADMINISTRATIVE**

**CPT Codes:**
83520-90

**LOINC Codes:**
57371-7

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
NSE

**Test Group:**
Neuron Specific Enolase

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
EIA

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
Hemolysis, or plasma sample.

**Specimen Preparation:**
Order Quest Test # 22251P
Units:
µg/L (mcg/L)

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
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</tr>
<tr>
<td>&gt;= 18 year olds</td>
<td>&lt;8.6 µg/L</td>
</tr>
</tbody>
</table>

Synonyms:
- NSE

Reported:
Performed 2x per week Turnaround time 3-6 days.

Additional Information:
Neuron Specific Enolase cannot be used as a diagnostic test without confirmation by another established test or procedure. Values obtained by different laboratories are generally not comparable. This test is performed using the Can Ag. EIA method.

Test is useful in monitoring disease progression and therapy in patients with small cell lung cancer and neuroendocrine tumors Neuroblastoma, Medullary Thyroid Ca, Pheochromocytoma and other malignancies that can secrete NSE such as Pancreatic Islet Cell Cancer

CPT Codes:
- 83520-90

LOINC Codes:
- 57371-7
Neutrophil Antibodies

ORDERING

Available Stat:  
No
Performing Lab:  
Quest
Methodology:  
Flow cytometry
Reported:  
5 - 7 days

Additional Information:  
Used for possible immune neutropenia unrelated to transfusion. For Wegener's Granulomatosis, see Neutrophil Cytoplasmic Antibodies.

Neutrophil-associated IgG and IgM are quantitated after incubating the patient's serum with formalin-fixed neutrophils. The test does NOT distinguish specific anti-neutrophil immunoglobulins from antibodies directed against HLA antigens.

Synonyms:
- Anti-Neutrophil Antibodies
- flow cytometry

COLLECTION

Sample Type:  
Serum
Collect:  
Red top (Gold top NOT acceptable)
Amount to Collect:  
2 mL blood
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.1 mL serum

PROCESSING

Test Code:  
NEUAB
Test Group:  
Neutrophil Antibodies
Sendout:  
Yes
Performing Lab:  
Quest
Specimen Preparation:  
Freeze at -20C and ship to China Basin
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.1 mL serum

RESULT INTERPRETATION
Reference Interval:
None detected

Additional Information:
Used for possible immune neutropenia unrelated to transfusion. For Wegener's Granulomatosis, see Neutrophil Cytoplasmic Antibodies.

Neutrophil-associated IgG and IgM are quantitated after incubating the patient's serum with formalin-fixed neutrophils. The test does NOT distinguish specific anti-neutrophil immunoglobulins from antibodies directed against HLA antigens.

CPT Codes:
86021-90

COMPLETE VIEW

Available Stat:
No
Test Code:
NEUAB
Test Group:
Neutrophil Antibodies
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Flow cytometry
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.1 mL serum
Specimen Preparation:
Freeze at -20C and ship to China Basin
Reference Interval:
None detected
Synonyms:
- Anti-Neutrophil Antibodies
- flow cytometry
Reported:
5 - 7 days
Additional Information:
Used for possible immune neutropenia unrelated to transfusion. For Wegener's Granulomatosis, see Neutrophil Cytoplasmic Antibodies.

Neutrophil-associated IgG and IgM are quantitated after incubating the patient's serum with formalin-fixed neutrophils. The test does NOT distinguish specific anti-neutrophil immunoglobulins from antibodies directed against HLA antigens.

CPT Codes:
86021-90
Neutrophil Cytoplasmic Antibodies
ANCA

ORDERING
Available Stat: No
Performing Lab: Immunology
Performed: Monday (day shift)
Methodology: Chemiluminescence
Reported: 2-8 days

Additional Information: This test may be useful in discriminating among the various vasculitides. Cytoplasmic (c-ANCA) antibodies giving diffuse cytoplasmic staining are directed against Proteinase-3, and are suggestive of a spectrum of diseases which includes Wegener's Granulomatosis, polyarteritis nodosa, Churg-Strauss syndrome, and primary necrotizing and crescentic glomerulonephritis. Perinuclear (p-ANCA) staining is due to antibodies to myeloperoxidase (MPO) and other antigens such as elastase and lactoferrin, and is less specific.

Synonyms:
- ANCA
- Anti-Neutrophil Antibodies
- anti-MPO
- Myeloperoxidase antibodies
- anti-myeloperoxidase
- Proteinase-3 Antibody
- anti-Proteinase-3 Antibody
- PR3
- anti-PR3

COLLECTION
Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Avoid hemolysis
Unacceptable Conditions: Grossly Hemolyzed, Lipemic or Icteric

PROCESSING
Test Code: ANCA
Test Group: Neutrophil Antibodies
Performing Lab: Immunology
Specimen Preparation: Freeze serum at -20°C.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Grossly Hemolyzed, Lipemic or Icteric

RESULT INTERPRETATION

Units: Chemiluminescence units (CU)
Reference Interval:
Myeloperoxidase Antibody (MPO) and Proteinase-3 Antibody (PR3):
Negative: < 20.0 CU
Positive: >= 20.0 CU
Additional Information:
This test may be useful in discriminating among the various vasculitides. Cytoplasmic (c-ANCA) antibodies giving diffuse cytoplasmic staining are directed against Proteinase-3, and are suggestive of a spectrum of diseases which includes Wegener’s Granulomatosis, polyarteritis nodosa, Churg-Strauss syndrome, and primary necrotizing and crescentic glomerulonephritis. Perinuclear (p-ANCA) staining is due to antibodies to myeloperoxidase (MPO) and other antigens such as elastase and lactoferrin, and is less specific.

ADMINISTRATIVE

CPT Codes:
83516 X 2
LOINC Codes:
45151-8

COMPLETE VIEW

Available Stat:
No
Test Code:
ANCA
Test Group:
Neutrophil Antibodies
Performing Lab:
Immunology
Performed:
Monday (day shift)
Methodology:
Chemiluminescence
Remarks:
Avoid hemolysis
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
  Serum

Preferred Volume:
  1 mL serum

Minimum Volume:
  0.5 mL serum

Unacceptable Conditions:
  Grossly Hemolyzed, Lipemic or Icteric

Specimen Preparation:
  Freeze serum at -20°C.

Units:
  Chemiluminescence units (CU)

Reference Interval:
  Myeloperoxidase Antibody (MPO) and Proteinase-3 Antibody (PR3):
  Negative: < 20.0 CU
  Positive: >= 20.0 CU

Synonyms:
- ANCA
- Anti-Neutrophil Antibodies
- anti-MPO
- Myeloperoxidase antibodies
- anti-myeloperoxidase
- Proteinase-3 Antibody
- anti-Proteinase-3 Antibody
- PR3
- anti-PR3

Reported:
  2-8 days

Additional Information:
  This test may be useful in discriminating among the various vasculitides. Cytoplasmic (c-ANCA) antibodies giving diffuse cytoplasmic staining are directed against Proteinase-3, and are suggestive of a spectrum of diseases which includes Wegener's Granulomatosis, polyarteritis nodosa, Churg-Strauss syndrome, and primary necrotizing and crescentic glomerulonephritis. Perinuclear (p-ANCA) staining is due to antibodies to myeloperoxidase (MPO) and other antigens such as elastase and lactoferrin, and is less specific.

CPT Codes:
  83516 X 2

LOINC Codes:
  45151-8
Neutrophil Oxidative Index

ORDERING

Approval Required:
Yes, Contact Immunology at x3-1712

Available Stat:
No

Performing Lab:
Immunology

Performed:
Tuesday, Wednesday only (day shift) by appointment. Contact Immunology at x3-1712

Methodology:
Flow Cytometry

Reported:
6-10 days

Additional Information:
This more sensitive assay replaces the NBT test in detecting defects in the generation of peroxide by the monophosphate shunt, and is capable of detecting the carrier state.

The neutrophil oxidative index and the net fluorescence are compared with those of a healthy control and the results are interpreted in a separate report.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Synonyms:
- NBT
- Nitro-blue tetrazolium
- CGD
- Chronic granulomatous disease
- NOI
- flow cytometry

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Dark Green top

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL whole blood

Minimum Volume:
2 mL whole blood

Remarks:
By appointment only with Immunology, call x3-1712

Sample should be delivered to the laboratory IMMEDIATELY and no later than 1000 on the day of testing. The specimen must reach the Immunology laboratory within FOUR hours of collection.

Unacceptable Conditions:
Delivered to lab > 30 min after collection or after 1000 hours Monday-Friday

PROCESSING

Test Code:
NOI
Performing Lab:
Immunology
Specimen Preparation:
Sample must be kept at room temperature and DO NOT centrifuge. Notify Immunology x3-1712 after sample is drawn.
Preferred Volume:
3 mL whole blood
Minimum Volume:
2 mL whole blood
Unacceptable Conditions:
Delivered to lab > 30 min after collection or after 1000 hours Monday-Friday

RESULT INTERPRETATION

Additional Information:
This more sensitive assay replaces the NBT test in detecting defects in the generation of peroxide by the monophosphate shunt, and is capable of detecting the carrier state.
The neutrophil oxidative index and the net fluorescence are compared with those of a healthy control and the results are interpreted in a separate report.
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

ADMINISTRATIVE

CPT Codes:
86352
LDT or Modified FDA:
Yes
LOINC Codes:
32631-4

COMPLETE VIEW

Approval Required:
Yes, Contact Immunology at x3-1712
Available Stat:
No
Test Code:
NOI
Performing Lab:
Immunology
Performed:
Tuesday, Wednesday only (day shift) by appointment. Contact Immunology at x3-1712
Methodology:
Flow Cytometry
Remarks:
By appointment only with Immunology, call x3-1712
Sample should be delivered to the laboratory IMMEDIATELY and no later than 1000 on the day of testing. The specimen must reach the Immunology laboratory within FOUR hours of collection.

Collect:
- Dark Green top

Amount to Collect:
- 3 mL blood

Sample Type:
- Heparinized whole blood

Preferred Volume:
- 3 mL whole blood

Minimum Volume:
- 2 mL whole blood

Unacceptable Conditions:
- Delivered to lab > 30 min after collection or after 1000 hours Monday-Friday

Specimen Preparation:
- Sample must be kept at room temperature and DO NOT centrifuge. Notify Immunology x3-1712 after sample is drawn.

Synonyms:
- NBT
- Nitro-blue tetrazolium
- CGD
- Chronic granulomatous disease
- NOI
- flow cytometry

Reported:
- 6-10 days

Additional Information:
This more sensitive assay replaces the NBT test in detecting defects in the generation of peroxide by the monophosphate shunt, and is capable of detecting the carrier state.

The neutrophil oxidative index and the net fluorescence are compared with those of a healthy control and the results are interpreted in a separate report.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
- 86352

LDT or Modified FDA:
- Yes

LOINC Codes:
- 32631-4
Newborn DAT Testing
NEWDAT

ORDERING

Performing Lab:
Mission Bay Transfusion Service

Performed:
Test Available 24 hours per day 7 days a week

Reported:
Routine 4 hours

Additional Information:
Testing includes DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.

Synonyms:
- Cord Blood

COLLECTION

Sample Type:
EDTA whole blood or Cord Blood

Collect:
Lavender top (6mL preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

PROCESSING

Test Code:
NEWDAT

Performing Lab:
Mission Bay Transfusion Service

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

RESULT INTERPRETATION

Additional Information:
Testing includes DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.

COMPLETE VIEW

Test Code:
Performing Lab: Mission Bay Transfusion Service

Performed:
Test Available 24 hours per day 7 days a week

Collect:
Lavender top (6mL preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood or Cord Blood

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

Synonyms:
• Cord Blood

Reported:
Routine 4 hours

Additional Information:
Testing includes DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.
Newborn Rh Testing

ORDERING

Performing Lab:
Mission Bay Transfusion Service

Performed:
Test Available 24 hours per day 7 days a week

Reported:
Routine 4 hours

Additional Information:
Testing includes Rh type and DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.

Synonyms:
- Cord Blood

COLLECTION

Sample Type:
EDTA whole blood or Cord Blood

Collect:
Lavender top (6mL preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

PROCESSING

Test Code:
NEWRH

Performing Lab:
Mission Bay Transfusion Service

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

RESULT INTERPRETATION

Additional Information:
Testing includes Rh type and DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.

COMPLETE VIEW

Test Code:
Performing Lab:
Mission Bay Transfusion Service

Performed:
Test Available 24 hours per day 7 days a week

Collect:
Lavender top (6mL preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood or Cord Blood

Preferred Volume:
6 mL

Minimum Volume:
3 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled, or hemolyzed sample. Samples without a collection date and time.

Synonyms:
• Cord Blood

Reported:
Routine 4 hours

Additional Information:
Testing includes Rh type and DAT-IgG only. Cord Blood sample preferred. Please indicate source of specimen (Cord Blood or Peripheral sample) when submitting specimen for testing.
Nicotine and Cotinine, urine
NICUR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Additional Information:
This assay is used for the detection of nicotine and cotinine in serum and plasma to determine the tobacco exposure status of the individual. Nicotine has a short half-life of approximately forty minutes; Its presence may indicate recent tobacco exposure. Cotinine, the major nicotine metabolite, has a half-life of 24 hours and is detectable for several days after cessation of tobacco exposure.
Synonyms:
- cigarette
- smoking
- tobacco

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 1 month

PROCESSING

Test Code:
NICUR
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and refrigerate sample. Transport to CB refrigerated. Order Quest test code 90646
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 1 month

RESULT INTERPRETATION
Units:
ng/mL

Reference Interval:
Nicotine:
Smokers: 200-700 ng/mL
Non-Smokers: <= 17 ng/mL

Cotinine:
Smokers: 300-1300 ng/mL
Non-Smokers: <= 20 ng/mL

Additional Information:
This assay is used for the detection of nicotine and cotinine in serum and plasma to determine the tobacco exposure status of the individual. Nicotine has a short half-life of approximately forty minutes; Its presence may indicate recent tobacco exposure. Cotinine, the major nicotine metabolite, has a half-life of 24 hours and is detectable for several days after cessation of tobacco exposure.

ADMINISTRATIVE

CPT Codes:
83887-90

COMPLETE VIEW

Available Stat:
No

Test Code:
NICUR

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Urine cup

Amount to Collect:
10 mL urine

Sample Type:
Random urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Specimen Preparation:
Aliquot and refrigerate sample. Transport to CB refrigerated. Order Quest test code 90646

Units:
ng/mL

Reference Interval:
Nicotine:
Smokers: 200-700 ng/mL
Non-Smokers: <= 17 ng/mL

Cotinine:
Smokers: 300-1300 ng/mL
Non-Smokers: <= 20 ng/mL

Synonyms:
• cigarette
• smoking
• tobacco

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 1 month

Additional Information:
This assay is used for the detection of nicotine and cotinine in serum and plasma to determine the tobacco exposure status of the individual. Nicotine has a short half-life of approximately forty minutes; its presence may indicate recent tobacco exposure. Cotinine, the major nicotine metabolite, has a half-life of 24 hours and is detectable for several days after cessation of tobacco exposure.

CPT Codes:
83887-90
N-methyl-D-Aspartate Receptor Antibody, IgG, CSF with Reflex to Titer

**ORDERING**

**Ordering Recommendations:**
Confirm diagnosis of anti-NMDAR encephalitis. May be used in monitoring treatment response in individuals who are antibody positive.

**Performing Lab:**
ARUP

**Performed:**
Tue, Fri

**Methodology:**
Semi-Quantitative Indirect Fluorescent Antibody

**Reported:**
1-5 days

**Synonyms:**
- anti-GluN1
- Anti-NMDA CSF
- anti-NR1
- Glutamate Receptor Antibodies
- N-Methyl D-Aspartate Ab CSF
- NMDA R
- NMDA Receptor Ab CSF

**COLLECTION**

**Collect:**
CSF.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
Refrigerated.

**Unacceptable Conditions:**
Contaminated, hemolyzed, or severely lipemic specimens.

**PROCESSING**

**Test Code:**
NMDC

**ARUP Test Code:**
2005164

**Sendout:**
Yes

**Performing Lab:**
ARUP

**Specimen Preparation:**
Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.15 mL)

**Unacceptable Conditions:**
Contaminated, hemolyzed, or severely lipemic specimens.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Storage/Transport Temperature:**
RESULT INTERPRETATION

Reference Interval:
Effective May 21, 2012
<1:1

Interpretive Data:
Anti-NMDA receptor IgG antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune limbic encephalitis.

ADMINISTRATIVE

CPT Codes:
86255; if reflexed, add 86256

COMPLETE VIEW

Ordering Recommendations:
Confirm diagnosis of anti-NMDAR encephalitis. May be used in monitoring treatment response in individuals who are antibody positive.

Test Code:
NMDC

ARUP Test Code:
2005164

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Tue, Fri

Methodology:
Semi-Quantitative Indirect Fluorescent Antibody

Collect:
CSF.

Unacceptable Conditions:
Contaminated, hemolyzed, or severely lipemic specimens.

Specimen Preparation:
Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.15 mL)

Reference Interval:
Effective May 21, 2012
<1:1

Interpretive Data:
Anti-NMDA receptor IgG antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune limbic encephalitis.

Synonyms:
- anti-GluN1
- Anti-NMDA CSF
- anti-NR1
- Glutamate Receptor Antibodies
- N-Methyl D-Aspartate Ab CSF
- NMDA R
• NMDA Receptor Ab CSF

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

Reported:
1-5 days

CPT Codes:
86255; if reflexed, add 86256

Notes:
If NMDA CSF antibody IgG is positive, then an NMDA CSF antibody IgG titer is reported. Additional charges apply.
N-methyl-D-Aspartate Receptor Antibody, IgG, Serum with Reflex to Titer
NMDS

ORDERING

Ordering Recommendations:
Confirm diagnosis of anti-NMDAR encephalitis. May be used in monitoring treatment response in individuals who are antibody positive.
Performing Lab:
ARUP
Performed:
Tue, Fri
Methodology:
Semi-Quantitative Indirect Fluorescent Antibody
Reported:
1-5 days
Synonyms:
- Anti-GluN1
- Anti-NMDA
- Anti-NR1
- Glutamate Receptor Antibodies
- N-Methyl D-Aspartate Ab
- NMDA R
- NMDA Receptor Ab
- NMDA Reflex
- NMDA Titer

COLLECTION

Collect:
Serum separator tube.
Stability (from collection to initiation):
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
Refrigerated.
Unacceptable Conditions:
CSF or plasma. Contaminated, hemolyzed, or severely lipemic specimens.

PROCESSING

Test Code:
NMDS
ARUP Test Code:
2004221
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.15 mL)
Unacceptable Conditions:
CSF or plasma. Contaminated, hemolyzed, or severely lipemic specimens.
Stability (from collection to initiation):
   After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)
Storage/Transport Temperature:
   Refrigerated.

RESULT INTERPRETATION

Reference Interval:
   <1:10
Interpretive Data:
   Anti-NMDA receptor IgG antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune limbic encephalitis.

ADMINISTRATIVE

CPT Codes:
   86255; if reflexed, add 86256

COMPLETE VIEW

Ordering Recommendations:
   Confirm diagnosis of anti-NMDAR encephalitis. May be used in monitoring treatment response in individuals who are antibody positive.
Test Code:
   NMDS
ARUP Test Code:
   2004221
Performing Lab:
   ARUP
Sendout:
   Yes
Performed:
   Tue, Fri
Methodology:
   Semi-Quantitative Indirect Fluorescent Antibody
Collect:
   Serum separator tube.
Unacceptable Conditions:
   CSF or plasma. Contaminated, hemolyzed, or severely lipemic specimens.
Specimen Preparation:
   Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.15 mL)
Reference Interval:
   <1:10
Interpretive Data:
   Anti-NMDA receptor IgG antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune limbic encephalitis.

Synonyms:
   - Anti-GluN1
   - Anti-NMDA
   - Anti-NR1
   - Glutamate Receptor Antibodies
- N-Methyl D-Aspartate Ab
- NMDA R
- NMDA Receptor Ab
- NMDA Reflex
- NMDA Titer

**Storage/Transport Temperature:**
Refrigerated.

**Stability (from collection to initiation):**
After separation from cells: Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year (avoid repeated freeze/thaw cycles)

**Reported:**
- 1-5 days

**CPT Codes:**
- 86255; if reflexed, add 86256

**Notes:**
If NMDA antibody IgG is positive, then an NMDA antibody IgG titer is reported. Additional charges apply.
N-Methylhistamine
NMHIN

ORDERING

Performing Lab: Mayo
Methodology: LC-MS/MS
Reported: 3-7 days
Additional Information:
Screening for and monitoring of mastocytosis and disorders of systemic mast-cell activation, such as anaphylaxis and other forms of severe systemic allergic reactions
Monitoring therapeutic progress in conditions that are associated with secondary, localized, low-grade persistent, mast-cell proliferation and activation such as interstitial cystitis

COLLECTION

Sample Type: Urine (24 hour or random)
Collect: Urine container
Amount to Collect: 5 mL
Preferred Volume: 5 mL
Minimum Volume: 3 mL
Remarks: No preservative required.
Stability (from collection to initiation):
Refrigerated (preferred): 8 days
Frozen: 14 days
Ambient: 24 hours

PROCESSING

Test Code: NMHIN
Sendout: Yes
Performing Lab: Mayo
Specimen Preparation: Aliquot and freeze specimen. Transport to CB frozen. Order Mayo test code NMHIN.
Preferred Volume: 5 mL
Minimum Volume: 3 mL
Stability (from collection to initiation):
Refrigerated (preferred): 8 days
Frozen: 14 days
Ambient: 24 hours

Test information subject to change
RESULT INTERPRETATION

Units:
   mcg/g Cr
Reference Interval:
   30-200

Additional Information:
   Screening for and monitoring of mastocytosis and disorders of systemic mast-cell activation, such as anaphylaxis and other forms of severe systemic allergic reactions
   Monitoring therapeutic progress in conditions that are associated with secondary, localized, low-grade persistent, mast-cell proliferation and activation such as interstitial cystitis

ADMINISTRATIVE

CPT Codes:
   82542-90
LOINC Codes:
   44340-8

COMPLETE VIEW

Test Code:
   NMHIN
Performing Lab:
   Mayo
Sendout:
   Yes
Methodology:
   LC-MS/MS
Remarks:
   No preservative required.
Collect:
   Urine container
Amount to Collect:
   5 mL
Sample Type:
   Urine (24 hour or random)
Preferred Volume:
   5 mL
Minimum Volume:
   3 mL
Specimen Preparation:
   Aliquot and freeze specimen. Transport to CB frozen. Order Mayo test code NMHIN.
Units:
   mcg/g Cr
Reference Interval:
   30-200
Stability (from collection to initiation):
   Refrigerated (preferred): 8 days
   Frozen: 14 days
   Ambient: 24 hours
Reported:
   3-7 days
Additional Information:

- Screening for and monitoring of mastocytosis and disorders of systemic mast-cell activation, such as anaphylaxis and other forms of severe systemic allergic reactions

- Monitoring therapeutic progress in conditions that are associated with secondary, localized, low-grade persistent, mast-cell proliferation and activation such as interstitial cystitis

CPT Codes:

- 82542-90

LOINC Codes:

- 44340-8
NMO/AQP-4 Antibody, IgG
NMO

ORDERING

Available Stat:  No
Performing Lab:  Mayo
Methodology:  ELISA
Reported:  1-2 weeks
Additional Information:

Neuromyelitis optica (NMO, sometimes called Devic disease) is a severe, relapsing, autoimmune, inflammatory and demyelinating central nervous system disease that predominantly affects optic nerves and the spinal cord. The disorder is now recognized as a spectrum of autoimmunity targeting the astrocytic water channel aquaporin-4 (AQP4). NMO spectrum disorders (NMOSD) may involve the brain and brainstem with symptoms of encephalopathy (particularly in children). The initial symptoms may be bouts of intractable nausea and vomiting. Magnetic resonance imaging typically reveals large inflammatory spinal cord lesions involving 3 or more vertebral segments. During acute attacks, the cerebrospinal fluid contains inflammatory cells, but usually lacks evidence of intrathecal IgG synthesis. The clinical course is characterized by relapses of optic neuritis or transverse myelitis, or both.

Prior to introducing a serological biomarker for NMO, the disorder was thought to be confined exclusively to the optic nerves and spinal cord, that the clinical course was monophasic and that NMO was a subset of multiple sclerosis (MS). The discovery of a highly specific disease marker for NMO (NMO-IgG/AQP4-IgG) helped to define the full clinical spectrum of NMOSD and to distinguish these disorders from MS. Attacks are often severe resulting in a rapid accumulation of disability (blindness and paraplegia). Within 5 years, 50% of patients lose functional vision in at least 1 eye or are unable to walk independently. Many patients with NMOSD are misdiagnosed as having MS. Importantly, the prognosis and optimal treatments for the 2 diseases differ. NMOSD typically has a worse natural history than MS, with frequent and early relapses. Treatments for NMOSD include corticosteroids and plasmapheresis for acute attacks and mycophenolate mofetil, azathioprine and rituximab for relapse prevention. Beta-interferon, a treatment promoted for MS, exacerbates NMOSD. Therefore, early diagnosis and initiation of NMO-appropriate immunosuppressant treatment is important to optimize the clinical outcome by preventing further attacks.

Detection of AQP4-IgG by enzyme-linked immunosorbent assay allows distinction of NMOSD (65%-77% are positive) from MS (0% positive), and is indicative of a relapsing disease, mandating initiation of immunosuppression, even after the first attack, thereby reducing attack frequency and disability in the future.

Synonyms:
- Devic disease
- Neuromyelitis optica
- NMO spectrum disorders

COLLECTION

Sample Type:  Serum or CSF
Collect:  Red top, Gold top, CSF tube or sterile collection tube
Amount to Collect:
- 2 mL Blood
- 1 mL CSF
Preferred Volume:
- 1 mL serum or CSF
Minimum Volume:
- 0.5 mL serum or CSF
Stability (from collection to initiation):
- Frozen, 2 weeks
PROCESSING

Test Code:
NMO
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Freeze serum and ship to China Basin frozen
Preferred Volume:
1 mL serum or CSF
Minimum Volume:
0.5 mL serum or CSF
Stability (from collection to initiation):
Frozen, 2 weeks

RESULT INTERPRETATION

Units:
U/mL
Reference Interval:
<1.6 U/mL
Additional Information:
Neuromyelitis optica (NMO, sometimes called Devic disease) is a severe, relapsing, autoimmune, inflammatory and demyelinating central nervous system disease that predominantly affects optic nerves and the spinal cord. The disorder is now recognized as a spectrum of autoimmunity targeting the astrocytic water channel aquaporin-4 (AQP4). NMO spectrum disorders (NMOSD) may involve the brain and brainstem with symptoms of encephalopathy (particularly in children). The initial symptoms may be bouts of intractable nausea and vomiting. Magnetic resonance imaging typically reveals large inflammatory spinal cord lesions involving 3 or more vertebral segments. During acute attacks, the cerebrospinal fluid contains inflammatory cells, but usually lacks evidence of intrathecal IgG synthesis. The clinical course is characterized by relapses of optic neuritis or transverse myelitis, or both.

Prior to introducing a serological biomarker for NMO, the disorder was thought to be confined exclusively to the optic nerves and spinal cord, that the clinical course was monophasic and that NMO was a subset of multiple sclerosis (MS). The discovery of a highly specific disease marker for NMO (NMO-IgG/AQP4-IgG) helped to define the full clinical spectrum of NMOSD and to distinguish these disorders from MS. Attacks are often severe resulting in a rapid accumulation of disability (blindness and paraplegia). Within 5 years, 50% of patients lose functional vision in at least 1 eye or are unable to walk independently. Many patients with NMOSD are misdiagnosed as having MS. Importantly, the prognosis and optimal treatments for the 2 diseases differ. NMOSD typically has a worse natural history than MS, with frequent and early relapses. Treatments for NMOSD include corticosteroids and plasmapheresis for acute attacks and mycophenolate mofetil, azathioprine and rituximab for relapse prevention. Beta-interferon, a treatment promoted for MS, exacerbates NMOSD. Therefore, early diagnosis and initiation of NMO-appropriate immunosuppressant treatment is important to optimize the clinical outcome by preventing further attacks.

Detection of AQP4-IgG by enzyme-linked immunosorbent assay allows distinction of NMOSD (65%-77% are positive) from MS (0% positive), and is indicative of a relapsing disease, mandating initiation of immunosuppression, even after the first attack, thereby reducing attack frequency and disability in the future.

ADMINISTRATIVE

CPT Codes:
83520-90

COMPLETE VIEW

Available Stat:
No
Test Code:
NMO
Performing Lab:
Mayo
Sendout:
Yes
Methodology:
ELISA
Collect:
Red top, Gold top, CSF tube or sterile collection tube
Amount to Collect:
2 mL Blood
1 mL CSF
Sample Type:
Serum or CSF
Preferred Volume:
1 mL serum or CSF
Minimum Volume:
0.5 mL serum or CSF
Specimen Preparation:
Freeze serum and ship to China Basin frozen
Units:
U/mL
Reference Interval:
<1.6 U/mL
Synonyms:
• Devic disease
• Neuromyelitis optica
• NMO spectrum disorders
Stability (from collection to initiation):
Frozen, 2 weeks
Reported:
1-2 weeks
Additional Information:
Neuromyelitis optica (NMO, sometimes called Devic disease) is a severe, relapsing, autoimmune, inflammatory and demyelinating central nervous system disease that predominantly affects optic nerves and the spinal cord. The disorder is now recognized as a spectrum of autoimmunity targeting the astrocytic water channel aquaporin-4 (AQP4). NMO spectrum disorders (NMOSD) may involve the brain and brainstem with symptoms of encephalopathy (particularly in children). The initial symptoms may be bouts of intractable nausea and vomiting. Magnetic resonance imaging typically reveals large inflammatory spinal cord lesions involving 3 or more vertebral segments. During acute attacks, the cerebrospinal fluid contains inflammatory cells, but usually lacks evidence of intrathecal IgG synthesis. The clinical course is characterized by relapses of optic neuritis or transverse myelitis, or both.

Prior to introducing a serological biomarker for NMO, the disorder was thought to be confined exclusively to the optic nerves and spinal cord, that the clinical course was monophasic and that NMO was a subset of multiple sclerosis (MS). The discovery of a highly specific disease marker for NMO (NMO-IgG/AQP4-IgG) helped to define the full clinical spectrum of NMOSD and to distinguish these disorders from MS. Attacks are often severe resulting in a rapid accumulation of disability (blindness and paraplegia). Within 5 years, 50% of patients lose functional vision in at least 1 eye or are unable to walk independently. Many patients with NMOSD are misdiagnosed as having MS. Importantly, the prognosis and optimal treatments for the 2 diseases differ. NMOSD typically has a worse natural history than MS, with frequent and early relapses. Treatments for NMOSD include corticosteroids and plasmapheresis for acute attacks and mycophenolate mofetil, azathioprine and rituximab for relapse prevention. Beta-interferon, a treatment promoted for MS, exacerbates NMOSD. Therefore, early diagnosis and initiation of NMO-appropriate immunosuppressant treatment is important to optimize the clinical outcome by preventing further attacks.

Detection of AQP4-IgG by enzyme-linked immunosorbent assay allows distinction of NMOSD (65%-77% are positive) from MS (0% positive), and is indicative of a relapsing disease, mandating initiation of immunosuppression, even after the first attack, thereby reducing attack frequency and disability in the future.

CPT Codes:
83520-90
Nonsyndromic Deafness
CNXN

ORDERING

Available Stat:
No
Performing Lab:
Stanford Hospital Clinical Laboratory
Methodology:
PCR and Gene sequencing
Reported:
7-14 days
Additional Information:
The connexins are a family of proteins that are present in gap junctions of adherent cells. A common frameshift mutation (35 delG) in the GJ2B gene that codes for connexin 26 was found to occur at a carrier frequency of approximately 1-3% in Europe and segregated worldwide in families with nonsyndromic recessive deafness. Another frameshift mutation (167 delT) is present at a carrier frequency of approximately 4% among Ashkenazi-Jewish individuals. This assay will test for both mutations, which are deleterious when detected either in homozygous form or in combination with one another. These two mutations account for approximately 23% of congenital deafness in Mediterranean and Ashkenazi Jewish populations.
If a mutation is detected it is recommended that the patient seek genetic counseling.

Synonyms:
- Connexin 26 Sequencing

COLLECTION

Sample Type:
Whole blood
Collect:
Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood (7 mL for B&T patients)
Minimum Volume:
2 mL blood (3 mL for B&T patients)
Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.
Patient insurance billing information MUST accompany test request when specimen is collected. Patient will be billed by Stanford Clinical Laboratory. (requires 7 mL whole blood, minimum: 3 mL)
Stanford TRF: Click here for Stanford Test Request Form
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code:
CNXN
Sendout:
Yes
Performing Lab:
Stanford Hospital Clinical Laboratory
Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable. Brown & Toland patients must be sent to LabCorp, order test #511920

Preferred Volume:
3 mL blood (7 mL for B&T patients)

Minimum Volume:
2 mL blood (3 mL for B&T patients)

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

RESULT INTERPRETATION

Reference Interval:
Mutations not detected

Additional Information:
The connexins are a family of proteins that are present in gap junctions of adherent cells. A common frameshift mutation (35 delG) in the GJ2B gene that codes for connexin 26 was found to occur at a carrier frequency of approximately 1-3% in Europe and segregated worldwide in families with nonsyndromic recessive deafness. Another frameshift mutation (167 delT) is present at a carrier frequency of approximately 4% among Ashkenazi-Jewish individuals. This assay will test for both mutations, which are deleterious when detected either in homozygous form or in combination with one another. These two mutations account for approximately 23% of congenital deafness in Mediterranean and Ashkenazi Jewish populations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

ADMINISTRATIVE

CPT Codes:
83891-90, 83894-90, 83898-90, 83904-90 x4, 83912-90

LOINC Codes:
35300-3

COMPLETE VIEW

Available Stat:
No

Test Code:
CNXN

Performing Lab:
Stanford Hospital Clinical Laboratory

Sendout:
Yes

Methodology:
PCR and Gene sequencing

Remarks:
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.

Patient insurance billing information MUST accompany test request when specimen is collected. Patient will be billed by Stanford Clinical Laboratory. (requires 7 mL whole blood, minimum: 3 mL)

Stanford TRF: Click here for Stanford Test Request Form

Collect:
Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:
3 mL blood

Sample Type:
Whole blood
Preferred Volume:
3 mL blood (7 mL for B&T patients)

Minimum Volume:
2 mL blood (3 mL for B&T patients)

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer.

Specimen Preparation:
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable. Brown & Toland patients must be sent to LabCorp, order test #511920

Reference Interval:
Mutations not detected

Synonyms:
- Connexin 26 Sequencing

Reported:
7-14 days

Additional Information:
The connexins are a family of proteins that are present in gap junctions of adherent cells. A common frameshift mutation (35 delG) in the GJ2B gene that codes for connexin 26 was found to occur at a carrier frequency of approximately 1-3% in Europe and segregated worldwide in families with nonsyndromic recessive deafness. Another frameshift mutation (167 delT) is present at a carrier frequency of approximately 4% among Ashkenazi-Jewish individuals. This assay will test for both mutations, which are deleterious when detected either in homozygous form or in combination with one another. These two mutations account for approximately 23% of congenital deafness in Mediterranean and Ashkenazi Jewish populations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

CPT Codes:
83891-90, 83894-90, 83898-90, 83904-90 x4, 83912-90

LOINC Codes:
35300-3
Norovirus RNA
P380

ORDERING

Available Stat: No
Performing Lab: Viracor
Methodology: RT-PCR, Qualitative
Reported: Turnaround time 2-5 days
Additional Information: This assay differentiates between Norovirus Group I and Group II. Genogroup I and Genogroup II assays show slight cross-reactivity with high titers of Norovirus Genotype IV RNA.
Synonyms:
- Norwalk-like virus

COLLECTION

Sample Type: Stool
Collect: Clean container (urine cup)
Amount to Collect: 2 mL
Preferred Volume: 2 mL
Minimum Volume: Pea size of formed stool or 2 mL of liquid stool
Remarks: Submit stool sample in clean container. Do NOT collect stool in preservative.
Stability (from collection to initiation): Room temp or refrigerated 96 hours, frozen 1 month.
Rejection Criteria: Stool received in preservative

PROCESSING

Test Code: P380
Sendout: Yes
Performing Lab: Viracor
Specimen Preparation: Specimen sent out by Microbiology. Freeze specimen and ship frozen. Seal lid of container with parafilm to prevent leakage during transit. Order Viracor test # 2400
Preferred Volume: 2 mL
Minimum Volume: Pea size of formed stool or 2 mL of liquid stool
Rejection Criteria:
Stool received in preservative

**Stability (from collection to initiation):**
- Room temp or refrigerated 96 hours, frozen 1 month.

## RESULT INTERPRETATION

**Reference Interval:**
- Not detected

**Additional Information:**
- This assay differentiates between Norovirus Group I and Group II. Genogroup I and Genogroup II assays show slight cross-reactivity with high titers of Norovirus Genotype IV RNA.

## ADMINISTRATIVE

**CPT Codes:**
- 87798-90 x2

**LOINC Codes:**
- 56748-7

## COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- P380

**Performing Lab:**
- Viracor

**Sendout:**
- Yes

**Methodology:**
- RT-PCR, Qualitative

**Remarks:**
- Submit stool sample in clean container. Do NOT collect stool in preservative.

**Collect:**
- Clean container (urine cup)

**Amount to Collect:**
- 2 mL

**Sample Type:**
- Stool

**Preferred Volume:**
- 2 mL

**Minimum Volume:**
- Pea size of formed stool or 2 mL of liquid stool

**Rejection Criteria:**
- Stool received in preservative

**Specimen Preparation:**
- Specimen sent out by Microbiology. Freeze specimen and ship frozen. Seal lid of container with parafilm to prevent leakage during transit. Order Viracor test # 2400

**Reference Interval:**
- Not detected

**Synonyms:**
- Norwalk-like virus

**Stability (from collection to initiation):**
- Room temp or refrigerated 96 hours, frozen 1 month.

**Reported:**
Turnaround time 2-5 days

**Additional Information:**
This assay differentiates between Norovirus Group I and Group II. Genogroup I and Genogroup II assays show slight cross-reactivity with high titers of Norovirus Genotype IV RNA.

**CPT Codes:**
87798-90 x2

**LOINC Codes:**
56748-7
Nortriptyline
NRT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Liquid Chromatography Tandem Mass Spectrometry
Reported: Test performed Monday-Saturday. Turnaround time: 2-5 days.
Synonyms:
  • Aventyl

COLLECTION

Sample Type: Serum
Collect:
  Red top (Gold top NOT acceptable)
Amount to Collect:
  8 mL blood
Preferred Volume:
  4 mL serum
Minimum Volume:
  1.5 mL serum
Unacceptable Conditions:
  Sample collected in Gold top

PROCESSING

Test Code: NRT
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
  If both Nortriptyline and Amitriptyline (Elavil) are requested, order Amitriptyline (AMTR) only.
  Separate serum promptly. Refrigerate. Order Quest # 272
Preferred Volume:
  4 mL serum
Minimum Volume:
  1.5 mL serum
Unacceptable Conditions:
  Sample collected in Gold top

RESULT INTERPRETATION

Units:
  μg/L (mcg/L)
Reference Interval:
Therapeutic: 50-150 µg/L
Potentially toxic: > 500 µg/L

Critical Values:
Quest Priority-1: >= 500 µg/L

CPT Codes:
80335-90

LOINC Codes:
3872-9

COMPLETE VIEW

Available Stat:
No

Test Code:
NRT

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography Tandem Mass Spectrometry

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
8 mL blood

Sample Type:
Serum

Preferred Volume:
4 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Sample collected in Gold top

Specimen Preparation:
If both Nortriptyline and Amitriptyline (Elavil) are requested, order Amitriptyline (AMTR) only.

Separate serum promptly. Refrigerate. Order Quest # 272

Units:
µg/L (mcg/L)

Reference Interval:
Therapeutic: 50-150 µg/L
Potentially toxic: > 500 µg/L

Critical Values:
Quest Priority-1: >= 500 µg/L

Synonyms:
• Aventyl

Reported:
Test performed Monday-Saturday. Turnaround time: 2-5 days.

CPT Codes:
80335-90

LOINC Codes:
NPM1 Exon 12 Mutations, Qualitative

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed:
Run 1st and 3rd Tuesday of every month, day shift only
Methodology:
Fluorescent PCR with analysis by capillary electrophoresis
Reported:
10-14 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Mutations in exon 12 of NPM1 are the most frequent molecular alterations in AML with normal karyotype, found in 60% of AML cases (one third of adult cases). This mutation causes mislocalization of NPM1 and its aberrant accumulation in the cytoplasm. NPM1 mutations are associated with other recurrent genetic changes, including chromosome abnormalities such as +8, +4, del(9q), and additional gene mutations, most importantly in FLT3.

Prognosis of cytogenetically normal AML with NPM1 mutations, particularly in the absence of FLT3 internal tandem duplication (ITD) mutation, is favorable when treated with high dose daunorubicin chemotherapy (Patel et al, N Engl J Med. 2012).

Results from this test do not exclude the presence of NPM1 mutations below the detection limit of this assay (2.5%), or the presence of other NPM1 mutations not detected by this assay. Results of this test should be interpreted within the clinical context to determine whether additional testing is necessary. This test is not intended to detect minimal residual disease.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

Synonyms:
- Nucleophosmin
- nucleolar phosphoprotein B23
- numatrın
- NPM-1

COLLECTION

Sample Type:
Blood, bone marrow aspirate, FFPE sections
Collect:
Lavender top (EDTA)
Amount to Collect:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section
Preferred Volume:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section
Minimum Volume:
Blood: 2 mL
Bone marrow aspirate: 3 mL
?FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&E stained section

**Remarks:**
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

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**PROCESSING**

**Test Code:**
NPM1

**Test Group:**
AML molecular markers

**Performing Lab:**
Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

**Preferred Volume:**
- Blood: 5 mL
- Bone marrow aspirate: 3 mL
- ?FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section

**Minimum Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 3 mL
- ?FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&E stained section

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

---

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Mutations in exon 12 of NPM1 are the most frequent molecular alterations in AML with normal karyotype, found in 60% of AML cases (one third of adult cases). This mutation causes mislocalization of NPM1 and its aberrant accumulation in the cytoplasm. NPM1 mutations are associated with other recurrent genetic changes, including chromosome abnormalities such as +8, +4, del(9q), and additional gene mutations, most importantly in FLT3.

Prognosis of cytogenetically normal AML with NPM1 mutations, particularly in the absence of FLT3 internal tandem duplication (ITD) mutation, is favorable when treated with high dose daunorubicin chemotherapy (Patel et al, N Engl J Med. 2012).

Results from this test do not exclude the presence of NPM1 mutations below the detection limit of this assay (2.5%), or the presence of other NPM1 mutations not detected by this assay. Results of this test should be interpreted within the clinical context to determine whether additional testing is necessary. This test is not intended to detect minimal residual disease.

---

**ADMINISTRATIVE**

**CPT Codes:**
81310
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
NPM1

Test Group:
AML molecular markers

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1st and 3rd Tuesday of every month, day shift only

Methodology:
Fluorescent PCR with analysis by capillary electrophoresis

Remarks:
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top (EDTA)

Amount to Collect:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section

Sample Type:
Blood, bone marrow aspirate, FFPE sections

Preferred Volume:
Blood: 5 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x5 on uncharged, unstained, glass slides plus one H&E stained section

Minimum Volume:
Blood: 2 mL
Bone marrow aspirate: 3 mL
FFPE: 10 micron sections x3 on uncharged, unstained, glass slides plus one H&E stained section

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship to CB as soon as possible.

Reference Interval:
Negative

Synonyms:
- Nucleophosmin
- nucleolar phosphoprotein B23
- numatrin
- NPM-1

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen unacceptable.

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Mutations in exon 12 of NPM1 are the most frequent molecular alterations in AML with normal karyotype, found in 60% of AML cases (one third of adult cases). This mutation causes mislocalization of NPM1 and its aberrant accumulation in the cytoplasm. NPM1 mutations are associated with other recurrent genetic changes, including chromosome abnormalities such as +8, +4, del(9q), and...
additional gene mutations, most importantly in FLT3.

Prognosis of cytogenetically normal AML with NPM1 mutations, particularly in the absence of FLT3 internal tandem duplication (ITD) mutation, is favorable when treated with high dose daunorubicin chemotherapy (Patel et al, N Engl J Med. 2012).

Results from this test do not exclude the presence of NPM1 mutations below the detection limit of this assay (2.5%), or the presence of other NPM1 mutations not detected by this assay. Results of this test should be interpreted within the clinical context to determine whether additional testing is necessary. This test is not intended to detect minimal residual disease.

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. This laboratory is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing.

CPT Codes:
81310

LDT or Modified FDA:
Yes
N-Telopeptide, 24 hour urine
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Enhanced Chemiluminescence
Reported:
Test run Tuesday-Sunday Turnaround time: 2-6 days.

Additional Information:
This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

Results are primarily of use in monitoring the response to treatment. A decline of $\geq 30\%$ following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88\% of women was associated with maintained or increased bone mineral density

Ref: Chestnut CH et al. Amer J Med 1997;192:29

Synonyms:
- Collagen-Crosslinked
- Bone markers
- osteoporosis

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Remarks:
For 24 hour specimen keep container refrigerated during collection.

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen at -20°C 1 month

Unacceptable Conditions:
Preserved or acidified sample. 24 hour collection container not refrigerated during collection.

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot 2 mL and freeze at -20C. Order Quest #36421X

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Unacceptable Conditions:
Preserved or acidified sample. 24 hour collection container not refrigerated during collection.

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
nmol BCE/mmol creatinine

Reference Interval:
>= 18 year old premenopausal females: 5-79 nmol BCE/mmol creatinine

>= 18 year old males:
18-29 years: 5-88 nmol BCE/mmol creatinine
30-39 years: 7-51 nmol BCE/mmol creatinine
40-49 years: 5-47 nmol BCE/mmol creatinine
50-60 years: 6-43 nmol BCE/mmol creatinine

Additional Information:
This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

Results are primarily of use in monitoring the response to treatment. A decline of >= 30% following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88% of women was associated with maintained or increased bone mineral density

Ref: Chestnut CH et al. Amer J Med 1997;192:29

ADMINISTRATIVE

CPT Codes:
82523-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Enhanced Chemiluminescence

Remarks:
For 24 hour specimen keep container refrigerated during collection.

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

**Sample Type:**
24 hour urine collection

**Preferred Volume:**
2 mL urine

**Minimum Volume:**
1 mL urine

**Unacceptable Conditions:**
Preserved or acidified sample. 24 hour collection container not refrigerated during collection.

**Specimen Preparation:**
Aliquot 2 mL and freeze at -20C. Order Quest #36421X

**Units:**
nmol BCE/mmol creatinine

**Reference Interval:**
>= 18 year old premenopausal females: 5-79 nmol BCE/mmol creatinine

>= 18 year old males:
18-29 years: 5-88 nmol BCE/mmol creatinine
30-39 years: 7-51 nmol BCE/mmol creatinine
40-49 years: 5-47 nmol BCE/mmol creatinine
50-60 years: 6-43 nmol BCE/mmol creatinine

**Synonyms:**
- Collagen-Crosslinked
- Bone markers
- osteoporosis

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 5 days, frozen at -20C 1 month

**Reported:**
Test run Tuesday-Sunday Turnaround time: 2-6 days.

**Additional Information:**
This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

Results are primarily of use in monitoring the response to treatment. A decline of >= 30% following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88% of women was associated with maintained or increased bone mineral density

Ref: Chestnut CH et al. Amer J Med 1997;192:29

**CPT Codes:**
82523-90
**N-Telopeptide, random urine**

**NTX**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Enhanced Chemiluminescence

**Reported:**
Test run Tuesday-Sunday Turnaround time: 2-6 days.

**Additional Information:**
This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

Results are primarily of use in monitoring the response to treatment. A decline of >= 30% following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88% of women was associated with maintained or increased bone mineral density

Ref: Chestnut CH et al. Amer J Med 1997;192:29

**Synonyms:**
- Collagen-Crosslinked
- Bone markers
- osteoporosis

**COLLECTION**

**Sample Type:**
Random urine

**Collect:**
Urine cup

**Amount to Collect:**
Random urine

**Preferred Volume:**
2 mL urine

**Minimum Volume:**
1 mL urine

**Remarks:**
The preferred sample is a second void urine. have patient void first morning urine and collected second void.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 5 days, frozen at -20C 1 month

**Unacceptable Conditions:**
Preserved or acidified sample.

**PROCESSING**

**Test Code:**
NTX

**Sendout:**
Yes

**Performing Lab:**
Quest
Specimen Preparation:
   Aliquot 2 mL and freeze at -20C. Order Quest #36167X

Preferred Volume:
   2 mL urine

Minimum Volume:
   1 mL urine

Unacceptable Conditions:
   Preserved or acidified sample.

Stability (from collection to initiation):
   Room temperature 3 days, refrigerated 5 days, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
   nmol BCE/mmol creatinine (BCE = Bone Collagen Equivalents)

Reference Interval:
   Pediatric:
       0-6 months 2-32 nmol BCE/mmol creatinine
       7-11 months 2-36 nmol BCE/mmol creatinine
       1-2 years 2-128 nmol BCE/mmol creatinine
       3-8 years 2-149 nmol BCE/mmol creatinine
       9-12 years 2-183 nmol BCE/mmol creatinine
       12-18 years male 20-370 nmol BCE/mmol creatinine
       >12 years female 20-320 nmol BCE/mmol creatinine

   Premenopausal Females 4-64 nmol BCE/mmol creatinine

   Males:
       18-29 years 12-99 nmol BCE/mmol creatinine
       30-59 years 9-60 nmol BCE/mmol creatinine

Additional Information:
   This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

   Results are primarily of use in monitoring the response to treatment. A decline of >= 30% following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88% of women was associated with maintained or increased bone mineral density

   Ref: Chestnut CH et al. Amer J Med 1997;192:29

ADMINISTRATIVE

CPT Codes:
   82523-90

LOINC Codes:
   14115-0

COMPLETE VIEW

Available Stat:
   No

Test Code:
   NTX

Performing Lab:
   Quest

Sendout:
   Printed 06/07/19
   Test information subject to change
Methodology:
Enhanced Chemiluminescence

Remarks:
The preferred sample is a second void urine. Have patient void first morning urine and collected second void.

Collect:
Urine cup

Amount to Collect:
Random urine

Sample Type:
Random urine

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Unacceptable Conditions:
Preserved or acidified sample.

Specimen Preparation:
Aliquot 2 mL and freeze at -20C. Order Quest #36167X

Units:
nmol BCE/ mmol creatinine (BCE = Bone Collagen Equivalents)

Reference Interval:

- **Pediatric:**
  - 0-6 months: 2-32 nmol BCE/ mmol creatinine
  - 7-11 months: 2-36 nmol BCE/ mmol creatinine
  - 1-2 years: 2-128 nmol BCE/ mmol creatinine
  - 3-8 years: 2-149 nmol BCE/ mmol creatinine
  - 9-12 years: 2-183 nmol BCE/ mmol creatinine
  - 12-18 years male: 20-370 nmol BCE/ mmol creatinine
  - >12 years female: 20-320 nmol BCE/ mmol creatinine

- **Premenopausal Females:** 4-64 nmol BCE/ mmol creatinine

- **Males:**
  - 18-29 years: 12-99 nmol BCE/ mmol creatinine
  - 30-59 years: 9-60 nmol BCE/ mmol creatinine

Synonyms:
- Collagen-Crosslinked
- Bone markers
- Osteoporosis

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 5 days, frozen at -20C 1 month

Reported:
Test run Tuesday-Sunday Turnaround time: 2-6 days.

Additional Information:
This assay reflects breakdown of bone matrix by collagenase. A value within the premenopausal range does not exclude osteoporosis or the need for therapy.

Results are primarily of use in monitoring the response to treatment. A decline of >= 30% following 6 months of estrogen replacement therapy is indicative of a positive therapeutic response in postmenopausal women and in 88% of women was associated with maintained or increased bone mineral density.

Ref: Chestnut CH et al. Amer J Med 1997;192:29

CPT Codes:
- 82523-90

LOINC Codes:
NTRK3 Break Apart Rearrangement FISH
BNTRK3, NTRK3

ORDERING

Performing Lab: Cytogenetics
Performed: Mon-Fri 9 am to 5 pm
Methodology: FISH
Reported: 7-14 days
Synonyms:
- BNTRK3
- NTRK3
- NTRK3 15q25.3 BA FISH

COLLECTION

Sample Type:
Blood, bone marrow aspirate, bone marrow core
Collect:
Blood: Dark Green Top Sodium Heparin tube for Blood
Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core
Amount to Collect:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm
Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm
Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm
Stability (from collection to initiation):
2 days
Storage/Transport Temperature:
Room Temperature
Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
Blood: BNTRK3
Bone marrow: NTRK3
Performing Lab: Cytogenetics
Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
- 2 days

Storage/Transport Temperature:
- Room Temperature

ADMINISTRATIVE

CPT Codes:
- 88271x2, 88275x1

COMPLETE VIEW

Test Code:
- Blood: BNTRK3
- Bone marrow: NTRK3

Performing Lab:
- Cytogenetics

Performed:
- Mon-Fri 9 am to 5 pm

Methodology:
- FISH

Collect:
- Blood: Dark Green Top Sodium Heparin tube for Blood
- Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:
- Blood, bone marrow aspirate, bone marrow core

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Synonyms:
- BNTRK3
- NTRK3
- NTRK3 15q25.3 BA FISH

Storage/Transport Temperature:
- Room Temperature

Stability (from collection to initiation):
- 2 days

Reported:
- 7-14 days
CPT Codes:
88271x2, 88275x1
Nucleated Bone Marrow Cell Count
BMNC

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology
Performed:
Test available 24 hours per day 7 days per week
Reported:
15 min
Additional Information:
Available stat for determining the adequacy of bone marrow collection for storage and transplantation

COLLECTION

Sample Type:
Heparinized Bone marrow
Collect:
Dark green top

PROCESSING

Test Code:
BMNC
Performing Lab:
Parnassus Hematology
Specimen Preparation:
Deliver immediately to Hematology.

RESULT INTERPRETATION

Reference Interval:
Anticoagulated bone marrow sample (usually heparinized and submitted in a Red top)
Additional Information:
Available stat for determining the adequacy of bone marrow collection for storage and transplantation

ADMINISTRATIVE

CPT Codes:
85048
LOINC Codes:
55792-6

COMPLETE VIEW

Available Stat:
No
Test Code:
BMNC
Performing Lab:
Parnassus Hematology

**Performed:**
Test available 24 hours per day 7 days per week

**Collect:**
Dark green top

**Sample Type:**
Heparinized Bone marrow

**Specimen Preparation:**
Deliver immediately to Hematology.

**Reference Interval:**
Anticoagulated bone marrow sample (usually heparinized and submitted in a Red top)

**Reported:**
15 min

**Additional Information:**
Available stat for determining the adequacy of bone marrow collection for storage and transplantation

**CPT Codes:**
85048

**LOINC Codes:**
55792-6
NUP 98 Break-apart Rearrangement FISH
NUP98, BNUP98

ORDERING

Performing Lab:
Cytogenetics

Performed:
Monday - Friday, 9 am to 5 pm

Methodology:
FISH

Reported:
7-14 days

Synonyms:
- NUP98
- BNUP98
- NUP98 11p15 Break-apart FISH

COLLECTION

Sample Type:
Blood, bone marrow aspirate, bone marrow core

Collect:
- Blood and bone marrow aspirate: Dark green top (sodium heparin)
- Bone marrow core: Sterile container

Amount to Collect:
See Preferred Volume

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Stability (from collection to initiation):
2 days

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
- Blood: BNUP98
- Bone marrow: NUP98

Performing Lab:
Cytogenetics

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

**Unacceptable Conditions:**
Clotted samples. Samples received refrigerated or frozen.

**Stability (from collection to initiation):**
2 days

**Storage/Transport Temperature:**
Room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
88271x2, 88275x1

---

**COMPLETE VIEW**

**Test Code:**
Blood: BNUP98
Bone marrow: NUP98

**Performing Lab:**
Cytogenetics

**Performed:**
Monday - Friday, 9 am to 5 pm

**Methodology:**
FISH

**Collect:**
Blood and bone marrow aspirate: Dark green top (sodium heparin)
Bone marrow core: Sterile container

**Amount to Collect:**
See Preferred Volume

**Sample Type:**
Blood, bone marrow aspirate, bone marrow core

**Preferred Volume:**
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

**Minimum Volume:**
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

**Unacceptable Conditions:**
Clotted samples. Samples received refrigerated or frozen.

**Synonyms:**
- NUP98
- BNUP98
- NUP98 11p15 Break-apart FISH

**Storage/Transport Temperature:**
Room temperature

**Stability (from collection to initiation):**
2 days

**Reported:**
7-14 days

**CPT Codes:**
88271x2, 88275x1
O.D. 450 Peak, Delta
OD45

ORDERING

Available Stat:
No

Performing Lab:
UC Irvine

Methodology:
Method of Freda & Liley

Reported:
Test performed daily. Turnaround time: 1 day.

Additional Information:
The interpretive criteria described above are well summarized by Robertson, JG. Amer J Obstet Gynec 1966;95,120.

Synonyms:
- OD450
- Bile
- Unconjugated bilirubin
- Optical density 450
- bilirubin

COLLECTION

Sample Type:
Amniotic fluid

Collect:
Clean screw-capped tube shielded from light

Amount to Collect:
See preferred volume

Preferred Volume:
7 mL amniotic fluid

Remarks:
Indicate the week of gestation on the requisition

PROCESSING

Test Code:
OD45

Sendout:
Yes

Performing Lab:
UC Irvine

Specimen Preparation:
Freeze sample at -20C in dark or foil wrapped container. Ship via Fed Ex on dry ice to Special Chemistry Lab, Route 80, UC Irvine Medical Center, 101 Orange Drive South, Orange, CA 92868 (714) 456-5548.

Indicate the week of gestation on the requisition and request that the report be telephoned to (415)353-1667 and the actual log graph faxed to (415)353-1346. Order UCI test AMBILI and call Fex Ex for pickup.)

Preferred Volume:
7 mL amniotic fluid

RESULT INTERPRETATION
Reference Interval:

Method of Freda:
1+ Normal or possibly affected <0.20
2+ Affected but not in jeopardy within 7 days 0.20-0.34
3+ Distressed and probably in failure 0.35-0.70
4+ Impending fetal death >0.70

Method of Liley:
Week of gestation Normal Borderline
25 <0.08 0.08-0.33
30 <0.05 0.05-0.21
35 <0.03 0.03-0.13
40 <0.02 0.02-0.08

Additional Information:
The interpretive criteria described above are well summarized by Robertson, JG. Amer J Obstet Gynec 1966;95,120.

ADMINISTRATIVE

CPT Codes:
82143-90

LOINC Codes:
14335-4

COMPLETE VIEW

Available Stat: No
Test Code: OD45
Performing Lab: UC Irvine
Sendout: Yes
Methodology: Method of Freda & Liley
Remarks: Indicate the week of gestation on the requisition
Collect: Clean screw-capped tube shielded from light
Amount to Collect: See preferred volume
Sample Type: Amniotic fluid
Preferred Volume: 7 mL amniotic fluid
Specimen Preparation:
Freeze sample at -20C in dark or foil wrapped container. Ship via Fed Ex on dry ice to Special Chemistry Lab, Route 80, UC Irvine Medical Center, 101 Orange Drive South, Orange, CA 92868 (714) 456-5548.

Indicate the week of gestation on the requisition and request that the report be telephoned to (415)353-1667 and the actual log graph faxed to (415)353-1346. Order UCI test AMBI1 and call Fed Ex for pickup.)

Reference Interval:

Method of Freda:
1+ Normal or possibly affected <0.20
2+ Affected but not in jeopardy within 7 days 0.20-0.34
3+ Distressed and probably in failure 0.35-0.70
4+ Impending fetal death >0.70

Method of Liley:
Week of gestation Normal Borderline
25  <0.08  0.08-0.33
30  <0.05  0.05-0.21
35  <0.03  0.03-0.13
40  <0.02  0.02-0.08

Synonyms:
- OD450
- Bile
- Unconjugated bilirubin
- Optical density 450
- bilirubin

Reported:
Test performed daily. Turnaround time: 1 day.

Additional Information:
The interpretive criteria described above are well summarized by Robertson, JG. Amer J Obstet Gynec 1966;95,120.

CPT Codes:
82143-90

LOINC Codes:
14335-4
Oligoclonal Bands in CSF and Serum

ORDERING

Ordering Recommendations:
Use for assessment of multiple sclerosis. Detect unique IgG oligoclonal bands in cerebrospinal fluid (CSF) in conjunction with a matched serum specimen. Preferred test is Oligoclonal Band Profile (0080440).

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Qualitative Isoelectric Focusing/Electrophoresis

Reported:
1-3 days

Synonyms:
- CSF oligoclonal bands
- Oligoclonal Bands Only
- Oligoclonal IgG, CSF
- Oligoclonal bands, CSF

COLLECTION

Sample Type:
CSF AND Serum

Collect:
CSF AND serum separator tube or plain red. Serum specimen should be drawn within 48 hours of CSF collection.

Preferred Volume:
CSF: 1.5 mL
Serum: 1 mL

Minimum Volume:
CSF: 0.7 mL
Serum: 0.5 mL

Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 1 week; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated.

PROCESSING

Test Code:
OLIGOB

ARUP Test Code:
0081135

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Allow serum to clot completely at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transport 1.5 mL CSF (Min: 0.7 mL) AND transfer 1 mL serum to an ARUP Standard Transport Tube (Min: 0.5 mL).

Preferred Volume:
CSF: 1.5 mL  
Serum: 1 mL

Minimum Volume:
CSF: 0.7 mL  
Serum: 0.5 mL

Stability (from collection to initiation):  
Ambient: 8 hours; Refrigerated: 1 week; Frozen: 1 year

Storage/Transport Temperature:  
Refrigerated.

RESULT INTERPRETATION

Reference Interval:  
Effective August 6, 2012

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oligoclonal Bands, CSF</td>
<td>Negative</td>
</tr>
<tr>
<td>Oligoclonal Bands Number, CSF</td>
<td>0 - 1 Bands</td>
</tr>
<tr>
<td>Interpretation</td>
<td>By report</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:  
83916

COMPLETE VIEW

Ordering Recommendations:  
Use for assessment of multiple sclerosis. Detect unique IgG oligoclonal bands in cerebrospinal fluid (CSF) in conjunction with a matched serum specimen. Preferred test is Oligoclonal Band Profile (0080440).

Test Code:  
OLIGOB

ARUP Test Code:  
0081135

Performing Lab:  
ARUP

Sendout:  
Yes

Performed:  
Sun-Sat

Methodology:  
Qualitative Isoelectric Focusing/Electrophoresis

Collect:  
CSF AND serum separator tube or plain red. Serum specimen should be drawn within 48 hours of CSF collection.

Sample Type:  
CSF AND Serum

Preferred Volume:  
CSF: 1.5 mL  
Serum: 1 mL

Minimum Volume:  
CSF: 0.7 mL  
Serum: 0.5 mL

Specimen Preparation:  
Allow serum to clot completely at room temperature. Separate serum from cells ASAP or within 2 hours of collection. Transport 1.5 mL CSF (Min: 0.7 mL) AND transfer 1 mL serum to an ARUP Standard Transport Tube (Min: 0.5 mL).
Reference Interval:

Effective August 6, 2012

<table>
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<td>Negative</td>
</tr>
<tr>
<td>Oligoclonal Bands Number, CSF</td>
<td>0 - 1 Bands</td>
</tr>
</tbody>
</table>

Interpretation: By report

Synonyms:
- CSF oligoclonal bands
- Oligoclonal Bands Only
- Oligoclonal IgG, CSF
- Oligoclonal bands, CSF

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 1 week; Frozen: 1 year

Reported:
1-3 days

CPT Codes:
83916

Notes:
Specimens must be assayed together for interpretation.
This test reports only the number of oligoclonal bands. A patient is considered positive for CSF oligoclonal bands if there are two or more bands in the CSF immunoglobulin region that are not present in the serum. In order to confirm local production of oligoclonal IgG in CSF, a matched serum sample is required. Oligoclonal bands present in CSF, but not in serum, indicate central nervous system production. Oligoclonal bands are performed using isoelectric focusing and immunofixation.
**Oligosaccharides**

**OSTLC**

**ORDERING**

Available Stat:  
No
Performing Lab:  
Stanford Hospital Clinical Laboratory
Methodology:  
Mass Spectometry
Reported:  
Turnaround time 5-7 days

**COLLECTION**

Sample Type:  
Random urine
Collect:  
Urine cup
Amount to Collect:  
10 mL urine
Preferred Volume:  
2 mL urine
Minimum Volume:  
1 mL urine
Remarks:  
Transport immediately to lab for processing
Rejection Criteria:  
Received thawed

**PROCESSING**

Test Code:  
OSTLC
Sendout:  
Yes
Performing Lab:  
Stanford Hospital Clinical Laboratory
Specimen Preparation:  
Freeze urine immediately at -20C and transport frozen.
Preferred Volume:  
2 mL urine
Minimum Volume:  
1 mL urine
Rejection Criteria:  
Received thawed

**ADMINISTRATIVE**

CPT Codes:  
84375-90
Available Stat: No
Test Code: OSTLC
Performing Lab: Stanford Hospital Clinical Laboratory
Sendout: Yes
Methodology: Mass Spectometry
Remarks: Transport immediately to lab for processing
Collect: Urine cup
Amount to Collect: 10 mL urine
Sample Type: Random urine
Preferred Volume: 2 mL urine
Minimum Volume: 1 mL urine
Rejection Criteria: Received thawed
Specimen Preparation: Freeze urine immediately at -20C and transport frozen.
Reported: Turnaround time 5-7 days
CPT Codes: 84375-90
Opiates Screen, Urine

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling
Reported: Stat 2 hours, Routine 4 hours
Additional Information:
- Morphine can be detected within 11-54 hours after use and can be detected as long as 11 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)
- A concentration of < 300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.
- This is a presumptive screen for possible heroin or morphine use within the past 1-2 days. It may also detect morphine from the metabolism of codeine.
- False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code OPIQNT.

Click here for List of Cross Reactive Substances

The assay is not sensitive in detecting most prescribed opiates such as hydrocodone, hydromorphone, oxycodone and oxymorphone. A separate oxycodone screen is available at UCSF (test code: OXYU) that detects oxycodone and oxymorphone. If hydrocodone or hydromorphone use is suspected, an opiate confirmation should be ordered from ARUP (test code: OPIQNT).

- False negative results may also occur as use of synthetic and some semi-synthetic opiates cannot be ruled out by this assay. Specifically, this assay will not detect use of fentanyl, methadone, meperidine or tramadol. A separate methadone screen is available at UCSF (test code: METHA). If use of opiates not detected by this screen is suspected, immunoassay screens can be ordered from ARUP [e.g. fentanyl (ARUP#2012284), meperidine (ARUP#2102288) or tramadol (ARUP#2012297)].

See also Drug Screening.

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Stability (from collection to initiation): Refrigerated 7 days, frozen at -20C 2 weeks
PROCESSING

Test Code: OPI
Test Group: Opiate
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20C 2 weeks

RESULT INTERPRETATION

Reference Interval:
Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 300 µg/L

Additional Information:
Morphine can be detected within 11-54 hours after use and can be detected as long as 11 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

A concentration of < 300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This is a presumptive screen for possible heroin or morphine use within the past 1-2 days. It may also detect morphine from the metabolism of codeine.

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code OPIQNT.

Click here for List of Cross Reactive Substances

The assay is not sensitive in detecting most prescribed opiates such as hydrocodone, hydromorphone, oxycodone and oxymorphone. A separate oxycodone screen is available at UCSF (test code: OXYU) that detects oxycodone and oxymorphone. If hydrocodone or hydromorphone use is suspected, an opiate confirmation should be ordered from ARUP (test code: OPIQNT).

False negative results may also occur as use of synthetic and some semi-synthetic opiates cannot be ruled out by this assay. Specifically, this assay will not detect use of fentanyl, methadone, meperidine or tramadol. A separate methadone screen is available at UCSF (test code: METHA). If use of opiates not detected by this screen is suspected, immunoassay screens can be ordered from ARUP (e.g. fentanyl (ARUP#2012284), meperidine (ARUP#2102288) or tramadol (ARUP#2012297).

See also Drug Screening.

ADMINISTRATIVE

CPT Codes: 80301
LOINC Codes: 19296-3

COMPLETE VIEW
Available Stat: Yes

Test Code: OPI

Test Group: Opiate

Performing Lab: Parnassus & Mission Bay Chemistry

Performed: Test available 24 hours per day 7 days per week

Methodology: Competitive enzyme immunoassay method (Beckman UniCel DxC 800 analyzer) using G6PDH-labeling

Collect: Urine cup

Amount to Collect: See preferred volume

Sample Type: Random urine

Preferred Volume: 1 mL urine

Minimum Volume: 0.5 mL urine

Reference Interval: Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 300 µg/L

Stability (from collection to initiation): Refrigerated 7 days, frozen at -20°C 2 weeks

Reported: Stat 2 hours, Routine 4 hours

Additional Information:

Morphine can be detected within 11-54 hours after use and can be detected as long as 11 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

A concentration of < 300 µg/L is considered negative by this test. A positive result is >= 300 µg/L and indicates the presence of this class of drugs. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This is a presumptive screen for possible heroin or morphine use within the past 1-2 days. It may also detect morphine from the metabolism of codeine.

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code OPIQNT.

Click here for List of Cross Reactive Substances

The assay is not sensitive in detecting most prescribed opiates such as hydrocodone, hydromorphone, oxycodone and oxymorphone. A separate oxycodone screen is available at UCSF (test code: OXYU) that detects oxycodone and oxymorphone. If hydrocodone or hydromorphone use is suspected, an opiate confirmation should be ordered from ARUP (test code: OPIQNT).

False negative results may also occur as use of synthetic and some semi-synthetic opiates cannot be ruled out by this assay. Specifically, this assay will not detect use of fentanyl, methadone, meperidine or tramadol. A separate methadone screen is available at UCSF (test code: METHA). If use of opiates not detected by this screen is suspected, immunoassay screens can be ordered from ARUP [e.g. fentanyl (ARUP#2012284), meperidine (ARUP#2102288) or tramadol (ARUP#2012297)].

See also Drug Screening.

CPT Codes:
80301
LOINC Codes:
19296-3
Opiates, Urine, Quantitative

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Opiates, Urine Screen with Reflex to Quantitation (2005093) is preferred.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- 6-Acetylmorphine
- 6-AM
- 6-MAM
- Anexsia
- Avinza
- Codeine
- Combunox
- Depalgos
- DepoDur
- Diacetylmorphine
- Diamorphine
- Dicodid
- Dihydromorphinone
- Dilaudid
- Dimorphine
- Drocode
- Duodin
- Duramorph
- Endocet
- Exalgo
- Heroin
- Histinex
- Hycet
- Hycodan
- Hycomine
- Hycotuss
- Hydrococet
- Hydrocodone
- Hydromet
- Hydromorphone
- Hydrovo
- Kadian
- Kolikodol
- Laudicon
- Loracet
- Lortab
- Mercodinone
- Methylmorphine
- Morphine
- MS Contin
- MS-Contin
- Norco
- Novahistex
- Numorphan
- Numorphone
- Opana
- Opium
- Oramorph
- Orthoxycol
- Oxycodone
- Oxymorphone
- Pain Management
- Pain Management, Opiates Expanded, Quantitative, with medMATCH, Urine
- Pain Management, Oxycodone, Quantitative, with medMATCH, Urine
- Palladone
- Paracodeine
- Paragoric
- Parzone
- Percocet
- Percodan
- Roxanol
- Roxicet
- Roxicodone
- Roxiprin
- Symphony
- Synkonin
- Targin
- Tussionex
- Tylox
- Vicodin
- Vicoprofen
- Zydone
Collect:
Random urine.

**Stability (from collection to initiation):**
- Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Storage/Transport Temperature:**
Room temperature.

**Unacceptable Conditions:**
Specimens exposed to repeated freeze/thaw cycles.

---

**PROCESSING**

**Test Code:**
OPIQNT

**ARUP Test Code:**
0090364

**Sendout:**
Yes

**Performing Lab:**
ARUP

**Specimen Preparation:**
Transfer 0.5 mL with no additives or preservatives urine to an ARUP Standard Transport Tube. (Min: 0.3 mL)

**Unacceptable Conditions:**
Specimens exposed to repeated freeze/thaw cycles.

**Stability (from collection to initiation):**
- Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Storage/Transport Temperature:**
Room temperature.

---

**RESULT INTERPRETATION**

**Reference Interval:**
Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Codeine</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Morphine</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>6-acetylmorphine</td>
<td>10 ng/mL</td>
</tr>
<tr>
<td>Hydrocodone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Norhydrocodone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Hydromorphone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Oxycodone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Noroxycodone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Oxymorphone</td>
<td>20 ng/mL</td>
</tr>
<tr>
<td>Noroxymorphone</td>
<td>20 ng/mL</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Positive cutoff: 20 ng/mL except as specified below:
6-acetylmorphine 10 ng/mL

For medical purposes only; not valid for forensic use.

Identification of specific drug(s) taken by specimen donor is problematic due to common metabolites, some of which are prescription drugs themselves. The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. All drug
analytes covered are in the non-glucuronidated (free) forms. The concentration value must be greater than or equal to the cutoff to be reported as positive. A very small amount of an unexpected drug analyte in the presence of a large amount of an expected drug analyte may reflect pharmaceutical impurity. Interpretive questions should be directed to the laboratory.

**ADMINISTRATIVE**

CPT Codes:
80361; 80365 (Alt code: G0480)

**COMPLETE VIEW**

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, Opiates, Urine Screen with Reflex to Quantitation (2005093) is preferred.

Test Code:
OPIQNT

ARUP Test Code:
0090364

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Collect:
Random urine.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Transfer 0.5 mL with no additives or preservatives urine to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Reference Interval:
Effective August 17, 2015

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Interpretive Data:
Methodology: Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Positive cutoff: 20 ng/mL except as specified below:
6-acetylmorphine 10 ng/mL

For medical purposes only; not valid for forensic use.

Identification of specific drug(s) taken by specimen donor is problematic due to common metabolites, some of which are prescription drugs themselves. The absence of expected drug(s) and/or drug metabolite(s) may indicate non-compliance, inappropriate timing of
specimen collection relative to drug administration, poor drug absorption, diluted/adulterated urine, or limitations of testing. All drug analytes covered are in the non-glucuronidated (free) forms. The concentration value must be greater than or equal to the cutoff to be reported as positive. A very small amount of an unexpected drug analyte in the presence of a large amount of an expected drug analyte may reflect pharmaceutical impurity. Interpretive questions should be directed to the laboratory.

**Synonyms:**

- 6-Acetylmorphine
- 6-AM
- 6-MAM
- Anexia
- Avinza
- Codeine
- Combunox
- Depalgos
- DepoDur
- Diacetylmorphine
- Diamorphine
- Dicodid
- Dihydromorphinone
- Dilaudid
- Dimorphine
- Drocode
- Duodin
- Duramorph
- Endocet
- Exalgo
- Heroin
- Histinex
- Hycet
- Hycodan
- Hycomine
- Hycotuss
- Hydrococet
- Hydrocodone
- Hydromet
- Hydromorphone
- Hydrovo
- Kadian
- Kolikodol
- Laudicon
- Loracet
- Lortab
- Mercodinone
- Methylmorphine
- Morphine
- MS Contin
• MS-Contin
• Norco
• Novahistex
• Numorphan
• Numorphone
• Opana
• Opium
• Oramorph
• Orthoxycol
• Oxycodone
• Oxymorphone
• Pain Management
• Pain Management, Opiates Expanded, Quantitative, with medMATCH, Urine
• Pain Management, Oxycodone, Quantitative, with medMATCH, Urine
• Palladone
• Paracodeine
• Paragoric
• Parzone
• Percocet
• Percodan
• Roxanol
• Roxicet
• Roxicodone
• Roxiprin
• Symtan
• Synkonin
• Targin
• Tussionex
• Tylox
• Vicodin
• Vicoprofen
• Zydone

**Storage/Transport Temperature:**
Room temperature.

**Stability (from collection to initiation):**
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

**Reported:**
1-4 days

**CPT Codes:**
80361; 80365 (Alt code: G0480)
OR Coagulation Panel 1

ORDERING

Available Stat: Yes
Additional Information: Panel contains the following tests: prothrombin time, activated partial thromboplastin time, fibrinogen and thromboelastogram w/heparin neutralization

COLLECTION

Collect: Blue top filled to full extent of vacuum

PROCESSING

Test Code: ORCO
Specimen Preparation: Contains the following test codes: PT, PTT, FIB

RESULT INTERPRETATION

Additional Information: Panel contains the following tests: prothrombin time, activated partial thromboplastin time, fibrinogen and thromboelastogram w/heparin neutralization

ADMINISTRATIVE

CPT Codes: 85384, 85610, 85730

COMPLETE VIEW

Available Stat: Yes
Test Code: ORCO
Collect: Blue top filled to full extent of vacuum
Specimen Preparation: Contains the following test codes: PT, PTT, FIB
Additional Information: Panel contains the following tests: prothrombin time, activated partial thromboplastin time, fibrinogen and thromboelastogram w/heparin neutralization
CPT Codes: 85384, 85610, 85730
Organic Acids, Qualitative
OAX

ORDERING

Available Stat:
No
Performing Lab:
Lucille-Packard Children's Hospital
Methodology:
GC/MS
Reported:
Test batched, twice weekly. Result available: 5 business days.
Additional Information:
This qualitative screen identifies abnormalities in over 200 different organic acids, using Gas Chromatography/Mass Spectrometry. Inborn errors of metabolism detected by this test include methymalonic academia, propionic academia, isovaleric academia, Canavan disease and many others.
Synonyms:
- Homogentisic Acid

COLLECTION

Sample Type:
Random urine, without preservatives
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
3 mL urine

PROCESSING

Test Code:
OAX
Sendout:
Yes
Performing Lab:
Lucille-Packard Children's Hospital
Specimen Preparation:
Store frozen at -20C. Specimen pickup by Stanford Courier Services Monday-Friday. Maintain specimen in frozen condition to Stanford Hospital Clinical Laboratories.
Preferred Volume:
5 mL urine
Minimum Volume:
3 mL urine

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
This qualitative screen identifies abnormalities in over 200 different organic acids, using Gas Chromatography/Mass Spectrometry. Inborn errors of metabolism detected by this test include methymalonic academia, propionic academia, isovaleric academia, Canavan disease and many others.

**Administrative**

**CPT Codes:**
- 83919-90

**LOINC Codes:**
- 2676-5

**Complete View**

**Available Stat:**
- No

**Test Code:**
- OAX

**Performing Lab:**
- Lucille-Packard Children's Hospital

**Sendout:**
- Yes

**Methodology:**
- GC/MS

**Collect:**
- Urine cup

**Amount to Collect:**
- 20 mL urine

**Sample Type:**
- Random urine, without preservatives

**Preferred Volume:**
- 5 mL urine

**Minimum Volume:**
- 3 mL urine

**Specimen Preparation:**
- Store frozen at -20°C. Specimen pickup by Stanford Courier Services Monday-Friday. Maintain specimen in frozen condition to Stanford Hospital Clinical Laboratories.

**Reference Interval:**
- Negative

**Synonyms:**
- Homogentisic Acid

**Reported:**
- Test batched, twice weekly. Result available: 5 business days.

**Additional Information:**
- This qualitative screen identifies abnormalities in over 200 different organic acids, using Gas Chromatography/Mass Spectrometry. Inborn errors of metabolism detected by this test include methymalonic academia, propionic academia, isovaleric academia, Canavan disease and many others.

**CPT Codes:**
- 83919-90

**LOINC Codes:**
- 2676-5
## Orotic Acid, Urine

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Lucille-Packard Childrens Hospital

**Methodology:**
- Stable isotope dilution, tandem MS

**Synonyms:**
- orotic acid quantitative
- orotic acid qualitative

### COLLECTION

**Sample Type:**
- Random urine

**Collect:**
- Urine cup

**Amount to Collect:**
- 20 mL urine

**Preferred Volume:**
- 3 mL urine

**Minimum Volume:**
- 3 mL urine

**Remarks:**
- Bring sample to laboratory immediately for freezing

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

### PROCESSING

**Test Code:**
- OROT

**Sendout:**
- Yes

**Performing Lab:**
- Lucille-Packard Childrens Hospital

**Specimen Preparation:**
- Freeze at -20C and ship frozen to China Basin. Ship on dry ice Monday-Friday only by Stanford Courier to: Stanford University Medical Center Biochemical Genetics Laboratory

**Preferred Volume:**
- 3 mL urine

**Minimum Volume:**
- 3 mL urine

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

### RESULT INTERPRETATION

**Units:**
mmol/mol creatinine

**Reference Interval:**

<4.4 mmol/mol creatinine

---

**ADMINISTRATIVE**

CPT Codes:
- 83789-90

LOINC Codes:
- 32262-8

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- OROT

**Performing Lab:**
- Lucille-Packard Childrens Hospital

**Sendout:**
- Yes

**Methodology:**
- Stable isotope dilution, tandem MS

**Remarks:**
- Bring sample to laboratory immediately for freezing

**Collect:**
- Urine cup

**Amount to Collect:**
- 20 mL urine

**Sample Type:**
- Random urine

**Preferred Volume:**
- 3 mL urine

**Minimum Volume:**
- 3 mL urine

**Unacceptable Conditions:**
- Delivered to lab > 30 min after collection

**Specimen Preparation:**
- Freeze at -20C and ship frozen to China Basin. Ship on dry ice Monday-Friday only by Stanford Courier to: Stanford University Medical Center Biochemical Genetics Laboratory

**Units:**
- mmol/mol creatinine

**Reference Interval:**
- <4.4 mmol/mol creatinine

**Synonyms:**
- orotic acid quantitative
- orotic acid qualitative

**CPT Codes:**
- 83789-90

**LOINC Codes:**
- 32262-8
Osmolality, serum
OSM

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Freezing point depression
Reported:
STAT 1 hour, Routine same or next day
Additional Information:
Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum.

Predicted value = 2xNa [mmol/L] + Glucose [mg/dL]/18 + BUN [mg/dL]/2.8.

A measured value exceeding the predicted value by > 10 is consistent with, e.g., ethanol, methanol or ethylene glycol ingestion.

If specific testing for methanol, ethylene glycol and/or isopropanol is desired see entry for Drug screening - Volatiles

Synonyms:
- volatiles
- ethanol
- etoh
- ethylene glycol
- methanol
- alcohol

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Light Green top
Amount to Collect:
0.8 mL blood
Preferred Volume:
0.4 mL serum
Minimum Volume:
0.1 mL serum
Stability (from collection to initiation):
Refrigerated 1 week

PROCESSING

Test Code:
OSM
Test Group:
Osmolality
Performing Lab:

Test information subject to change
Parnassus & Mission Bay Chemistry

**Preferred Volume:**
0.4 mL serum

**Minimum Volume:**
0.1 mL serum

**Stability (from collection to initiation):**
Refrigerated 1 week

---

### RESULT INTERPRETATION

**Units:**

mmol/kg (equiv. to mOsmol/Kg)

**Reference Interval:**

283-301 mmol/kg

**Critical Values:**

<240 mmol/kg or > 320 mmol/kg

**Additional Information:**

Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum.

Predicted value = 2xNa [mmol/L] + Glucose [mg/dL]/18 + BUN [mg/dL]/2.8.

A measured value exceeding the predicted value by > 10 is consistent with, e.g., ethanol, methanol or ethylene glycol ingestion.

If specific testing for methanol, ethylene glycol and/or isopropanol is desired see entry for Drug screening - Volatiles

---

### ADMINISTRATIVE

**CPT Codes:**

83930

**LOINC Codes:**

2692-2

---

### COMPLETE VIEW

**Available Stat:**

Yes

**Test Code:**

OSM

**Test Group:**

Osmolality

**Performing Lab:**

Parnassus & Mission Bay Chemistry

**Performed:**

Test available 24 hours per day 7 days per week

**Methodology:**

Freezing point depression

**Collect:**

Gold top or Light Green top

**Amount to Collect:**

0.8 mL blood

**Sample Type:**

Serum

**Preferred Volume:**

0.4 mL serum

**Minimum Volume:**
0.1 mL serum

**Units:**
mmol/kg (equiv. to mOsmol/Kg)

**Reference Interval:**
283-301 mmol/kg

**Critical Values:**
<240 mmol/kg or > 320 mmol/kg

**Synonyms:**
- volatiles
- ethanol
- etoh
- ethylene glycol
- methanol
- alcohol

**Stability (from collection to initiation):**
Refrigerated 1 week

**Reported:**
STAT 1 hour, Routine same or next day

**Additional Information:**
Each 0.10 g/dL of ethanol contributes about 22 mmol/kg to the endogenous osmolality of serum.

\[
\text{Predicted value} = 2 \times \text{Na [mmol/L]} + \frac{\text{Glucose [mg/dL]}}{18} + \frac{\text{BUN [mg/dL]}}{2.8}.
\]

A measured value exceeding the predicted value by > 10 is consistent with, e.g., ethanol, methanol or ethylene glycol ingestion.

If specific testing for methanol, ethylene glycol and/or isopropanol is desired see entry for Drug screening - Volatiles

**CPT Codes:**
83930

**LOINC Codes:**
2692-2
Osmolality, stool
OSMST

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours a day 7 days per week

Methodology:
Freezing point depression

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

COLLECTION

Sample Type:
Watery stool

Collect:
Urine cup or clean container

Unacceptable Conditions:
Non-watery stool received

PROCESSING

Test Code:
OSMST

Performing Lab:
Parnassus & Mission Bay Chemistry

Unacceptable Conditions:
Non-watery stool received

RESULT INTERPRETATION

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”
ADMINISTRATIVE

CPT Codes:
84999

COMPLETE VIEW

Available Stat:
No
Ordering Recommendations:
Not a routinely available test. See 'Additional information'
Test Code:
OSMST
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours a day 7 days per week
Methodology:
Freezing point depression
Collect:
Urine cup or clean container
Sample Type:
Watery stool
Unacceptable Conditions:
Non-watery stool received
Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:
84999
Osmolality, urine
OSMU

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Freezing point depression
Reported:
Same or next day
Additional Information:
Toluene interferes with this assay
Synonyms:
• volatiles
• ethanol
• etoh
• ethylene glycol
• methanol
• alcohol

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
0.4 mL urine
Minimum Volume:
0.1 mL urine
Stability (from collection to initiation):
Refrigerated 1 week

PROCESSING

Test Code:
OSMU
Test Group:
Osmolality
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
0.4 mL urine
Minimum Volume:
0.1 mL urine
Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Units:
mmol/kg (equiv. to mOsmol/Kg)

Reference Interval:
300-900 mmol/kg

Additional Information:
Toluene interferes with this assay

ADMINISTRATIVE

CPT Codes:
83935

LOINC Codes:
2695-5

COMPLETE VIEW

Available Stat:
Yes

Test Code:
OSMU

Test Group:
Osmolality

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Freezing point depression

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
0.4 mL urine

Minimum Volume:
0.1 mL urine

Units:
mmol/kg (equiv. to mOsmol/Kg)

Reference Interval:
300-900 mmol/kg

Synonyms:
- volatiles
- ethanol
- etoh
- ethylene glycol
- methanol
- alcohol

**Stability (from collection to initiation):**
- Refrigerated 1 week

**Reported:**
- Same or next day

**Additional Information:**
- Toluene interferes with this assay

**CPT Codes:**
- 83935

**LOINC Codes:**
- 2695-5
Osteocalcin
OCAL

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Electrochemiluminescence (ECLIA)
Reported:
Test performed Tuesday and Thursday. Turnaround time: 3-9 days.
Additional Information:
This test is not a MediCal benefit; outpatients must be informed of this in writing and warned that they could be financially responsible for the cost of testing.

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred. Patients should not receive Biotin within 8 hours prior to collection
Sample Type:
Serum
Collect:
Red top or Gold Top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Refrigerated 1 day, frozen at -20C 3 weeks
Unacceptable Conditions:
Hemolysis
Rejection Criteria:
Hemolysis

PROCESSING

Test Code:
OCAL
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum at -20C. Order Quest #16322, if patient is Brown/Toland order LabCorp #010249.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Hemolysis
Rejection Criteria:

- Hemolysis

Stability (from collection to initiation):

- Refrigerated 1 day, frozen at -20C 3 weeks

RESULT INTERPRETATION

Units:

- ng/mL

Reference Interval:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9 years</td>
<td>47-142 ng/mL</td>
</tr>
<tr>
<td>10-13 years</td>
<td>49-167 ng/mL</td>
</tr>
<tr>
<td>14-17 year old males</td>
<td>26-203 ng/mL</td>
</tr>
<tr>
<td>14-17 year old females</td>
<td>14-85 ng/mL</td>
</tr>
<tr>
<td>Males &gt; 17 years</td>
<td>9-38 ng/mL</td>
</tr>
<tr>
<td>Females &gt; 17 years</td>
<td>8-32 ng/mL</td>
</tr>
</tbody>
</table>

Additional Information:

This test is not a MediCal benefit; outpatients must be informed of this in writing and warned that they could be financially responsible for the cost of testing.

ADMINISTRATIVE

CPT Codes:

- 83937-90

LOINC Codes:

- 2697-1

COMPLETE VIEW

Available Stat:

- No

Test Code:

- OCAL

Performing Lab:

- Quest

Sendout:

- Yes

Methodology:

- Electrochemiluminescence (ECLIA)

Patient Preparation:

- An 8 hour fast before specimen collection is preferred. Patients should not receive Biotin within 8 hours prior to collection

Collect:

- Red top or Gold Top

Amount to Collect:

- 2 mL blood

Sample Type:

- Serum

Preferred Volume:

- 1 mL serum

Minimum Volume:

- 0.5 mL serum

Rejection Criteria:

- Hemolysis

Unacceptable Conditions:

- Hemolysis
Specimen Preparation:
Freeze serum at -20°C. Order Quest #16322, if patient is Brown/Toland order LabCorp #010249.

Units:
ng/mL

Reference Interval:
- 5-9 years: 47-142 ng/mL
- 10-13 years: 49-167 ng/mL
- 14-17 year old males: 26-203 ng/mL
- 14-17 year old females: 14-85 ng/mL
- Males > 17 years: 9-38 ng/mL
- Females > 17 years: 8-32 ng/mL

Stability (from collection to initiation):
Refrigerated 1 day, frozen at -20°C 3 weeks

Reported:
Test performed Tuesday and Thursday. Turnaround time: 3-9 days.

Additional Information:
This test is not a MediCal benefit; outpatients must be informed of this in writing and warned that they could be financially responsible for the cost of testing.

CPT Codes:
83937-90

LOINC Codes:
2697-1
Ova and Parasite Exam
P401

ORDERING

Approval Required:
Contact Microbiology at x3-1268 for Stool O&P requests on inpatients > 72 hours after admission.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Monday-Friday, day shift

Methodology:
Microscopy

Reported:
1-3 days

Additional Information:
Includes concentration and iron-hematoxylin smear, and Kinyoun stain of unconcentrated sample for Cyclospora, Cryptosporidia, and Cystoisospora.

Aspirates are not acceptable for Giardia Antigen or Entamoeba histolytica antigen.

Also see entries for Giardia Antigen, Coccidia Exam, and Microsporidia.

For hepatic abscess aspirates: If the specimen is QNS to prepare stained smears, a wet mount alone will be done and procedure P412 charged.

Synonyms:
- Ova & Parasites
- O&P
- scolex
- Protozoan concentration
- Coccidia
- Entamoeba histolytica

COLLECTION

Patient Preparation:
Patient should be off ALL antibiotics for >= 2 weeks before for an O&P examination to be valid.

Sample Type:
Stool; Duodenal/Colonic/Stool aspirates; Hepatic abscess aspirates

Collect:
Hepatic abscess aspirates: Sterile container
All other samples: SAF vial

SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB).

Outpatients can obtain these from the laboratories’ draw stations.

Amount to Collect:
See preferred volume

Preferred Volume:
Stool: 10 mL (fill SAF vial to red line on container label)
Duodenal/Colonic/Stool aspirates: 15 mL
Hepatic abscess aspirates: 2 mL

**Minimum Volume:**
5 mL (2 mL for Hepatic abscess aspirates)

**Remarks:**
Collect 3 stool samples (one every 48 hours preferred, one per day is acceptable) to improve the chance of a positive result.

Aspirates submitted in a sterile container or leuker trap should be received in laboratory within 30 minutes of collection.

**Stability (from collection to initiation):**

- **Preserved:** 2 weeks
- **Unpreserved:** 1 hour (aspirates will be accepted >1 hour, but results may be compromised).

**Rejection Criteria:**
- Unpreserved stool received > 1 hour after collection.
- Stool in a preservative other than SAF.
- More than one stool sample received within 24 hours.
- Stool not mixed well in SAF, or if preservative has been poured out or is expired.
- SAF container filled past the red line on the container label.

**PROCESSING**

**Test Code:**
P401

**Test Group:**
Parasites

**Performing Lab:**
Microbiology

**Specimen Preparation:**
Hepatic abscess aspirates: Put 1 ml of the specimen into a 15 ml centrifuge tube and add 2 parts SAF to 1 part specimen. Label tube as “SAF preserved.” The remaining unpreserved aspirate should be refrigerated.

Transfer all other unpreserved samples to SAF preservative upon receipt in lab.

Do not reject unpreserved aspirates >1 hour post collection. Enter COMPRO in SREQ.

When receiving O&Ps by mail open each box individually. If necessary, label sample with patient name from information sheet in box. If information sheet is not filled out, give mailing container to parasitologist to investigate. If collection date is missing from specimens, accession each specimen and freetext note in SREQ "No collection date provided."

**Preferred Volume:**
- Stool: 10 mL (fill SAF vial to red line on container label)
- Duodenal/Colonic/Stool aspirates: 15 mL
- Hepatic abscess aspirates: 2 mL

**Minimum Volume:**
5 mL (2 mL for Hepatic abscess aspirates)

**Rejection Criteria:**
- Unpreserved stool received > 1 hour after collection.
- Stool in a preservative other than SAF.
- More than one stool sample received within 24 hours.
- Stool not mixed well in SAF, or if preservative has been poured out or is expired.
- SAF container filled past the red line on the container label.

**Stability (from collection to initiation):**

- **Preserved:** 2 weeks
- **Unpreserved:** 1 hour (aspirates will be accepted >1 hour, but results may be compromised).
**Reference Interval:**
No parasites seen

**Critical Values:**
Entamoeba histolytica in hepatic aspirate

**Additional Information:**
Includes concentration and iron-hematoxylin smear, and Kinyoun stain of unconcentrated sample for Cyclospora, Cryptosporidia, and Cystoisospora.

Aspirates are not acceptable for Giardia Antigen or Entamoeba histolytica antigen.

Also see entries for Giardia Antigen, Coccidia Exam, and Microsporidia.

For hepatic abscess aspirates: If the specimen is QNS to prepare stained smears, a wet mount alone will be done and procedure P412 charged.

**ADMINISTRATIVE**

**CPT Codes:**
- 87177
- 88313
- 87206

**LOINC Codes:**
- 10704-5

**COMPLETE VIEW**

**Approval Required:**
Contact Microbiology at x3-1268 for Stool O&P requests on inpatients > 72 hours after admission.

**Available Stat:**
No

**Test Code:**
P401

**Test Group:**
Parasites

**Performing Lab:**
Microbiology

**Performed:**
Monday-Friday, day shift

**Methodology:**
Microscopy

**Patient Preparation:**
Patient should be off ALL antibiotics for >= 2 weeks before for an O&P examination to be valid.

**Remarks:**
Collect 3 stool samples (one every 48 hours preferred, one per day is acceptable) to improve the chance of a positive result.

Aspirates submitted in a sterile container or leukem trap should be received in laboratory within 30 minutes of collection.

**Collect:**
Hepatic abscess aspirates: Sterile container

All other samples: SAF vial

SAF vials and instructions available from Material Services (PMM # 44366 Vials SAF Sterile Child Resistant Cap 574-05-CRC-WB).

Outpatients can obtain these from the laboratories’ draw stations.

**Amount to Collect:**
See preferred volume

**Sample Type:**
- Stool: Duodenal/Colonic/Stool aspirates
- Hepatic abscess aspirates

**Preferred Volume:**

Printed 06/07/19
Test information subject to change
Stool: 10 mL (fill SAF vial to red line on container label)

Duodenal/Colonic/Stool aspirates: 15 mL

Hepatic abscess aspirates: 2 mL

**Minimum Volume:**
5 mL (2 mL for Hepatic abscess aspirates)

**Rejection Criteria:**
- Unpreserved stool received > 1 hour after collection.
- Stool in a preservative other than SAF.
- More than one stool sample received within 24 hours.
- Stool not mixed well in SAF, or if preservative has been poured out or is expired.
- SAF container filled past the red line on the container label.

**Specimen Preparation:**
- Hepatic abscess aspirates: Put 1 ml of the specimen into a 15 ml centrifuge tube and add 2 parts SAF to 1 part specimen. Label tube as “SAF preserved.” The remaining unpreserved aspirate should be refrigerated.

- Transfer all other unpreserved samples to SAF preservative upon receipt in lab.

- Do not reject unpreserved aspirates >1 hour post collection. Enter COMPRO in SREQ.

When receiving O&Ps by mail open each box individually. If necessary, label sample with patient name from information sheet in box. If information sheet is not filled out, give mailing container to parasitologist to investigate. If collection date is missing from specimens, accession each specimen and freetext note in SREQ “No collection date provided.”

**Reference Interval:**
No parasites seen

**Critical Values:**
Entamoeba histolytica in hepatic aspirate

**Synonyms:**
- Ova & Parasites
- O&P
- scolex
- Protozoan concentration
- Coccidia
- Entamoeba histolytica

**Stability (from collection to initiation):**
- Preserved: 2 weeks
- Unpreserved: 1 hour (aspirates will be accepted >1 hour, but results may be compromised).

**Reported:**
1-3 days

**Additional Information:**
Includes concentration and iron-hematoxylin smear, and Kinyoun stain of unconcentrated sample for Cyclospora, Cryptosporidia, and Cystoisospora.

Aspirates are not acceptable for Giardia Antigen or Entamoeba histolytica antigen.

Also see entries for Giardia Antigen, Coccidia Exam, and Microsporidia.

For hepatic abscess aspirates: If the specimen is QNS to prepare stained smears, a wet mount alone will be done and procedure P412 charged.

**CPT Codes:**
87177, 88313, 87206

**LOINC Codes:**
10704-5
Oxalic acid, 24 hour urine
OXAU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric, enzymatic
Reported:
Test run Monday-Friday Turnaround time: 2-5 days.
Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 11.4.
Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.
Synonyms:
• Oxalate

COLLECTION

Patient Preparation:
Patient should refrain from eating chocolate, nuts, rhubarb, spinach, tea and vitamin C for 48 hours prior to collection.
Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine

PROCESSING

Test Code:
OXAU
Test Group:
Oxalate
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Adjust pH to 2.0 - 3.0. Mix well before aliquoting. Refrigerate. For 24 hour urine order Quest # 5421N.
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
RESULT INTERPRETATION

Units:
mg/24 h
Reference Interval:
3.6-38 mg/24 h
Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 11.4.

Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

ADMINISTRATIVE

CPT Codes:
83945-90
LOINC Codes:
2701-1

COMPLETE VIEW

Available Stat:
No
Test Code:
OXAU
Test Group:
Oxalate
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Spectrophotometric, enzymatic
Patient Preparation:
Patient should refrain from eating chocolate, nuts, rhubarb, spinach, tea and vitamin C for 48 hours prior to collection.
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Sample Type:
24 hour urine collection
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Specimen Preparation:
Adjust pH to 2.0 - 3.0. Mix well before aliquoting. Refrigerate. For 24 hour urine order Quest # 5421N.
Units:
mg/24 h
Reference Interval:
3.6-38 mg/24 h
Synonyms:
- Oxalate

Reported:
Test run Monday-Friday Turnaround time: 2-5 days.

**Additional Information:**

To convert mg/d to µmol/d (SI units) multiply by 11.4.

Urinary creatinine is assayed as a measure of the completeness of urine collection. If the total creatinine excretion is not within normal limits for the patient's age and sex (see entry for Creatinine) and the patient has normal renal function, the urine collection is probably incomplete and the result is invalid.

**CPT Codes:**

83945-90

**LOINC Codes:**

2701-1
Oxalic acid, plasma

**ORDERING**

Available Stat:  
No  
Performing Lab:  
Mayo  
Methodology:  
Spectrophotometry  
Synonyms:  
• Oxalate  

**COLLECTION**

Patient Preparation:  
Patient should be fasting (12 hours) and should avoid taking vitamin C supplements for 24 hours prior to draw.  
Sample Type:  
Heparinized plasma  
Collect:  
Dark Green top (on ice)  
Amount to Collect:  
10 mL blood  
Preferred Volume:  
5 mL plasma  
Minimum Volume:  
2 mL plasma  
Remarks:  
Place green top tube on wet ice immediately, transport blood tube on ice to the specimen processing section of Clinical Laboratories asap.  
Unacceptable Conditions:  
Sample not received on ice or delivered > 30 min after collection.  
Rejection Criteria:  
Thawed, non-acidified or non-heparinized samples.  

**PROCESSING**

Test Code:  
OXALP  
Test Group:  
Oxalate  
Sendout:  
Yes  
Performing Lab:  
Mayo  
Specimen Preparation:  
Centrifuge sample at 4C in a refrigerated centrifuge for 10 minutes at 2000 rpm within 1 hour of draw.  
IMPORTANT: After centrifugation, bring the plasma specimen to Chemistry so the pH can be adjusted to a pH of 1.0 to 3.5 (ideal range is 2.3 to 2.7).  
Freeze sample at -20C and send frozen in a plastic vial on dry ice to China Basin sendouts. Do not allow to thaw.  
Order Mayo test # 81408.
Preferred Volume:
5 mL plasma

Minimum Volume:
2 mL plasma

Unacceptable Conditions:
Sample not received on ice or delivered > 30 min after collection.

Rejection Criteria:
Thawed, non-acidified or non-heparinized samples.

RESULT INTERPRETATION

Units:
µmol/L

Reference Interval:
<1.8 µmol/L

ADMINISTRATIVE

CPT Codes:
83945-90

LOINC Codes:
15085-4

COMPLETE VIEW

Available Stat:
No

Test Code:
OXALP

Test Group:
Oxalate

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Spectrophotometry

Patient Preparation:
Patient should be fasting (12 hours) and should avoid taking vitamin C supplements for 24 hours prior to draw.

Remarks:
Place green top tube on wet ice immediately, transport blood tube on ice to the specimen processing section of Clinical Laboratories asap.

Collect:
Dark Green top (on ice)

Amount to Collect:
10 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
5 mL plasma

Minimum Volume:
2 mL plasma

Rejection Criteria:
Thawed, non-acidified or non-heparinized samples.
Unacceptable Conditions:
Sample not received on ice or delivered > 30 min after collection.

Specimen Preparation:
Centrifuge sample at 4°C in a refrigerated centrifuge for 10 minutes at 2000 rpm within 1 hour of draw.

IMPORTANT: After centrifugation, bring the plasma specimen to Chemistry so the pH can be adjusted to a pH of 1.0 to 3.5 (ideal range is 2.3 to 2.7).

Freeze sample at -20°C and send frozen in a plastic vial on dry ice to China Basin sendouts. Do not allow to thaw.

Order Mayo test # 81408.

Units:
µmol/L

Reference Interval:
<1.8 µmol/L

Synonyms:
• Oxalate

CPT Codes:
83945-90

LOINC Codes:
15085-4
Oxalic acid, random urine
OXALR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometry
Reported:
Run 5x per week. Turnaround 3-5 days
Synonyms:
- Oxalate

COLLECTION

Patient Preparation:
Patient should refrain from eating chocolate, nuts, rhubarb, spinach, tea and vitamin C for 48 hours prior to collection.
Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL urine
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Acidified random urine: Room temperature 6 days, refrigerated 1 week, frozen at -20C 4 months

PROCESSING

Test Code:
OXALR
Test Group:
Oxalate
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Adjust pH to 2.0 - 3.0 with 6 N HCl. Refrigerate aliquot at 4C. Order Quest test # 10456X
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Stability (from collection to initiation):
Acidified random urine: Room temperature 6 days, refrigerated 1 week, frozen at -20C 4 months

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
  mg/g Creatinine

Reference Interval:
  Male: 3-30 mg/g Creatinine
  Female: 3-40 mg/g Creatinine

ADMINISTRATIVE

CPT Codes:
  82570-90, 83945-90
LOINC Codes:
  13483-3

COMPLETE VIEW

Available Stat:
  No
Test Code:
  OXALR
Test Group:
  Oxalate
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Spectrophotometry
Patient Preparation:
  Patient should refrain from eating chocolate, nuts, rhubarb, spinach, tea and vitamin C for 48 hours prior to collection.
Collect:
  Urine cup
Amount to Collect:
  10 mL urine
Sample Type:
  Random urine
Preferred Volume:
  10 mL urine
Minimum Volume:
  2 mL urine
Specimen Preparation:
  Adjust pH to 2.0 - 3.0 with 6 N HCl. Refrigerate aliquot at 4C. Order Quest test # 10456X
Units:
  mg/g Creatinine
Reference Interval:
  Male: 3-30 mg/g Creatinine
  Female: 3-40 mg/g Creatinine
Synonyms:
  • Oxalate
Stability (from collection to initiation):
  Acidified random urine: Room temperature 6 days, refrigerated 1 week, frozen at -20C 4 months
Reported:
  Run 5x per week. Turnaround 3-5 days
CPT Codes:
  82570-90, 83945-90
LOINC Codes:
13483-3
Oxcarbazepine
OXCBP

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Liquid Chromatography Tandem Mass Spectrometry
Reported: 5-7 days
Synonyms:
- Trileptal
- 10-hydroxycarbazepine

COLLECTION

Sample Type: Serum or EDTA plasma
Collect: Red top or Lavendar top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Room temperature 3 days, refrigerated 2 weeks, frozen 2 months

PROCESSING

Test Code: OXCBP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate sample
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation): Room temperature 3 days, refrigerated 2 weeks, frozen 2 months

RESULT INTERPRETATION

Units: µg/mL (mcg/mL)
Reference Interval:
Therapeutic: 8.0-35.0 mcg/mL
Toxic: > 35.0 mcg/mL
Lower Detection limit: 0.5 mcg/mL

ADMINISTRATIVE

CPT Codes:
83789-90

COMPLETE VIEW

Available Stat:
No

Test Code:
OXCBP
Performing Lab:
Quest

Sendout:
Yes

Methodology:
Liquid Chromatography Tandem Mass Spectrometry
Collect:
Red top or Lavendar top
Amount to Collect:
2 mL blood
Sample Type:
Serum or EDTA plasma
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum

Specimen Preparation:
Refrigerate sample

Units:
µg/mL (mcg/mL)
Reference Interval:
Therapeutic: 8.0-35.0 mcg/mL
Toxic: > 35.0 mcg/mL
Lower Detection limit: 0.5 mcg/mL

Synonyms:
• Trileptal
• 10-hydroxycarbazepine

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen 2 months

Reported:
5-7 days

CPT Codes:
83789-90
**Oxycodone screen, urine**

**ORDERING**

**Available Stat:**
Yes

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Enzyme immunoassay method using DRI technology (Beckman UniCel DxC 800 analyzer)

**Reported:**
Stat: 2 hours
Routine: 4 hours

**Additional Information:**
This assay detects both oxycodone and oxymorphone. Oxymorphone is the principal active metabolite of oxycodone, and a prescription drug in its own right (Baselt RC and Stewart CB, Determination of oxycodone and a major metabolite in urine by electron-capture GLC. J Anal Toxicol 2(3):107-109, 1978)

**NOTE:** The assay is not sensitive in detecting most prescribed opiates such as morphine, codeine, hydrocodone, hydromorphone, or heroin use. The opiate immunoassay screen (OPI) or an opiate confirmation assay (OPIQNT) should be ordered to measure these other compounds. Additionally, this oxycodone screen will not detect fentanyl, methadone or meperidine.

For a list of cross-reacting substances of this assay click here.

A concentration of < 100 µg/L is considered negative by this test. A positive result is >= 100 µg/L and indicates presence of oxycodone or oxymorphone. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This is a presumptive screen for possible oxycodone and oxymorphone use within the past 1-3 days. False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing (Test code OPIQNT)

**Synonyms:**
- OxyContin
- Percocet
- Percodan
- Oxymorphone
- Opana
- Numorphan
- Numorphine

**COLLECTION**

**Sample Type:**
Random urine

**Collect:**
Urine cup

**Amount to Collect:**
10 mL urine

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.5 mL urine
Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

**PROCESSING**

Test Code:
OXYU

Test Group:
Oxycodone

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

**RESULT INTERPRETATION**

Units:
µg/L (mcg/L)

Reference Interval:
Negative

(Note: a negative result indicates that oxycodone is not present, or it is present at a concentration below the cut-off concentration of 100 µg/L)

Additional Information:
This assay detects both oxycodone and oxymorphone. Oxymorphone is the principal active metabolite of oxycodone, and a prescription drug in its own right (Baselt RC and Stewart CB, Determination of oxycodone and a major metabolite in urine by electron-capture GLC. J Anal Toxicol 2(3):107-109, 1978)

**NOTE:** The assay is not sensitive in detecting most prescribed opiates such as morphine, codeine, hydrocodone, hydromorphone, or heroin use. The opiate immunoassay screen (OPI) or an opiate confirmation assay (OPIQNT) should be ordered to measure these other compounds. Additionally, this oxycodone screen will not detect fentanyl, methadone or meperidine.

[For a list of cross-reacting substances of this assay click here.](#)

A concentration of < 100 µg/L is considered negative by this test. A positive result is >= 100 µg/L and indicates presence of oxycodone or oxymorphone. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

This is a presumptive screen for possible oxycodone and oxymorphone use within the past 1-3 days. False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing (Test code OPIQNT)

**ADMINISTRATIVE**

CPT Codes:
80301

LOINC Codes:
19296-3

**COMPLETE VIEW**

Available Stat:
Yes
Test Code: OXYU
Test Group: Oxycodone
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzyme immunoassay method using DRI technology (Beckman UniCel DxC 800 analyzer)
Collect: Urine cup
Amount to Collect: 10 mL urine
Sample Type: Random urine
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Units: µg/L (mcg/L)
Reference Interval: Negative
(Note: a negative result indicates that oxycodone is not present, or it is present at a concentration below the cut-off concentration of 100 µg/L)
Synonyms:
• OxyContin
• Percocet
• Percodan
• Oxymorphone
• Opana
• Numorphan
• Numorphine
Stability (from collection to initiation): Refrigerated 1 week, frozen 1 month
Reported: Stat: 2 hours
Routine: 4 hours
Additional Information:
This assay detects both oxycodone and oxymorphone. Oxymorphone is the principal active metabolite of oxycodone, and a prescription drug in its own right (Baselt RC and Stewart CB, Determination of oxycodone and a major metabolite in urine by electron-capture GLC. J Anal Toxicol 2(3):107-109, 1978)
NOTE: The assay is not sensitive in detecting most prescribed opiates such as morphine, codeine, hydrocodone, hydromorphone, or heroin use. The opiate immunoassay screen (OPI) or an opiate confirmation assay (OPIQNT) should be ordered to measure these other compounds. Additionally, this oxycodone screen will not detect fentanyl, methadone or mepiridine.
For a list of cross-reacting substances of this assay click here.
A concentration of < 100 µg/L is considered negative by this test. A positive result is >= 100 µg/L and indicates presence of oxycodone or oxymorphone. This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.
This is a presumptive screen for possible oxycodone and oxymorphone use within the past 1-3 days. False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of
the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing (Test code OPIQNT)

CPT Codes:

80301

LOINC Codes:

19296-3
Pancreatic Elastase, Fecal by ELISA
ELAS

ORDERING

Ordering Recommendations:
Screen for exocrine pancreatic insufficiency.

Available Stat:
No

Performing Lab:
ARUP

Performed:
Sun, Tue-Fri

Methodology:
Quantitative Enzyme-Linked Immunosorbent Assay

Reported:
1-4 days

Additional Information:

Synonyms:
• fecal elastase
• EL1
• Elastase
• Elastase-1
• Fecal Elastase
• Pancreatic Elastase Stool
• pancreatic stool elastase
• pancreatic stool elastase concentration
• PE stool

COLLECTION

Collect:
Stool.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 year

Storage/Transport Temperature:
Frozen.

Unacceptable Conditions:
Stool in media or preservative. Swabs.

PROCESSING

Test Code:
ELAS

ARUP Test Code:
0080526

Sendout:
Yes

Performing Lab:

Printed 06/07/19
Test information subject to change
ARUP

Specimen Preparation:
Transfer 5 g stool to an unpreserved stool transport vial (ARUP supply #40910). Available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787. (Min: 1 g)

Unacceptable Conditions:
Stool in media or preservative. Swabs.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 year

Storage/Transport Temperature:
Frozen.

RESULT INTERPRETATION

Units:
µg/g stool

Reference Interval:
Effective August 7, 2017

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<thead>
<tr>
<th>Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater than 200 µg/g</td>
<td>Normal</td>
</tr>
<tr>
<td>100-200 µg/g</td>
<td>Moderate to mild exocrine pancreatic insufficiency</td>
</tr>
<tr>
<td>Less than 100 µg/g</td>
<td>Severe exocrine pancreatic insufficiency</td>
</tr>
</tbody>
</table>

Additional Information:

Interpretive Data:
Reference range does not apply for infants less than one month old.

ADMINISTRATIVE

CPT Codes:
83520

LOINC:
- 25907-7

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Screen for exocrine pancreatic insufficiency.

Test Code:
ELAS

ARUP Test Code:
0080526

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun, Tue-Fri

Methodology:
Quantitative Enzyme-Linked Immunosorbent Assay

Collect:
Stool.

**Unacceptable Conditions:**
- Stool in media or preservative. Swabs.

**Specimen Preparation:**
- Transfer 5 g stool to an unpreserved stool transport vial (ARUP supply #40910). Available online through eSupply using ARUP Connect(TM) or contact ARUP Client Services at (800) 522-2787. (Min: 1 g)

**Units:**
- µg/g stool

**Reference Interval:**

<table>
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<tr>
<th>Range</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
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<td>100-200 µg/g</td>
<td>Moderate to mild exocrine pancreatic insufficiency</td>
</tr>
<tr>
<td>Less than 100 µg/g</td>
<td>Severe exocrine pancreatic insufficiency</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
- Reference range does not apply for infants less than one month old.

**Synonyms:**
- fecal elastase
- EL1
- Elastase
- Elastase-1
- Fecal Elastase
- Pancreatic Elastase Stool
- pancreatic stool elastase
- pancreatic stool elastase concentration
- PE stool

**Storage/Transport Temperature:**
- Frozen.

**Stability (from collection to initiation):**
- Ambient: 1 week; Refrigerated: 1 week; Frozen: 1 year

**Reported:**
- 1-4 days

**Additional Information:**

**CPT Codes:**
- 83520

**LOINC:**
- 25907-7

**Notes:**
- Enzyme substitution therapy does not influence the determination of pancreatic elastase 1.
**Pancreatic Polypeptide**

**PPEP**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Extraction, RIA

**Reported:**
Test run Thursday. Turnaround: 7-14 days.

### COLLECTION

**Patient Preparation:**
An 8 hour fast before specimen collection is required.

No radioisotopes should be administered during the 24 hours prior to specimen collection.

**Sample Type:**
EDTA plasma (Serum for B&T patients)

**Collect:**
Lavender top (Red top or Gold top for B&T patients)

**Amount to Collect:**
4 mL blood

**Preferred Volume:**
2 mL serum or plasma

**Minimum Volume:**
0.6 mL serum or plasma

**Remarks:**
For Brown & Toland patients, collect serum in Red top or Gold top tube instead of plasma.

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen at -20C 1 month

### PROCESSING

**Test Code:**
PPEP

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Process immediately and freeze plasma at -20C in plastic tube. Order Quest # 4789X

For Brown & Toland patients, collect SERUM in Red top or SST tube. Process within 4 hours of collection, freeze immediately and ship frozen to sendout at China Basin. Order LabCorp test # 146704. Patient should fast for 10 hours prior to specimen collection.

**Preferred Volume:**
2 mL serum or plasma

**Minimum Volume:**
0.6 mL serum or plasma

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen at -20C 1 month
RESULT INTERPRETATION

Units: pg/mL

Reference Interval:

<table>
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<tr>
<th>Age</th>
<th>Reference Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;3 years</td>
<td>Not established</td>
</tr>
<tr>
<td>3-9 years</td>
<td>&lt;= 519 pg/mL</td>
</tr>
<tr>
<td>10-13 years</td>
<td>&lt;= 361 pg/mL</td>
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<tr>
<td>14-17 years</td>
<td>&lt;= 297 pg/mL</td>
</tr>
<tr>
<td>18-29 years</td>
<td>&lt;480 pg/mL</td>
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<tr>
<td>30-39 years</td>
<td>70-400 pg/mL</td>
</tr>
<tr>
<td>40-49 years</td>
<td>70-430 pg/mL</td>
</tr>
<tr>
<td>60-52 years</td>
<td>100-780 pg/mL</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
83519-90

LOINC Codes:
2721-9

COMPLETE VIEW

Available Stat: No

Test Code: PPEP

Performing Lab: Quest

Sendout: Yes

Methodology:
Extraction, RIA

Patient Preparation:
An 8 hour fast before specimen collection is required.

No radioisotopes should be administered during the 24 hours prior to specimen collection.

Remarks:
For Brown & Toland patients, collect serum in Red top or Gold top tube instead of plasma.

Collect:
Lavender top (Red top or Gold top for B&T patients)

Amount to Collect:
4 mL blood

Sample Type:
EDTA plasma (Serum for B&T patients)

Preferred Volume:
2 mL serum or plasma

Minimum Volume:
0.6 mL serum or plasma

Specimen Preparation:
Process immediately and freeze plasma at -20C in plastic tube. Order Quest # 4789X

For Brown & Toland patients, collect SERUM in Red top or SST tube. Process within 4 hours of collection, freeze immediately and ship frozen to sendout at China Basin. Order LabCorp test # 146704. Patient should fast for 10 hours prior to specimen collection.
Units:
   pg/mL

Reference Interval:

   Age       Reference Range
   <3 years  Not established
   3-9 years <= 519 pg/mL
   10-13 years <= 361 pg/mL
   14-17 years <= 297 pg/mL
   18-29 years <= 480 pg/mL
   30-39 years 70-400 pg/mL
   40-49 years 70-430 pg/mL
   60-52 years 100-780 pg/mL

Stability (from collection to initiation):

   Refrigerated 1 week, frozen at -20°C 1 month

Reported:

   Test run Thursday. Turnaround: 7-14 days.

CPT Codes:

   83519-90

LOINC Codes:

   2721-9
Para-Aminobenzoic Acid
MOLT

ORDERING

Available Stat:
No
Performing Lab:
National Medical Service via Quest
Methodology:
Solid phase
Additional Information:
PABA is the end-product measured in the Bentiromide test for pancreatic insufficiency. This test is NOT accurate if the creatinine exceeds 2.0 mg/dL, and a false-negative result may be obtained due to drug and/or dietary interference.
Synonyms:
- PABA

COLLECTION

Patient Preparation:
Any pancreatic enzyme supplements should be discontinued for 5 days before testing of an adult, for 1 day in a child with cystic fibrosis. An 8 hour fast before specimen collection is preferred.
Sample Type:
6 hour urine
Collect:
24 hour urine collection container
Amount to Collect:
Entire urine output over 6 hour period
Preferred Volume:
10 mL urine
Minimum Volume:
1 mL urine
Remarks:
The patient should be given Bentiromide after an overnight fast (500 mg for an adult or 14 mg/kg for a child) and the urine collected for the next 6 hours.
Refrigerate container during collection.
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
National Medical Service via Quest
Specimen Preparation:
Record total urine volume. Refrigerate sample. Order Quest # 4927X
Preferred Volume:
10 mL urine
Minimum Volume:
1 mL urine
**Unacceptable Conditions:**
Container not refrigerated during collection.

**RESULT INTERPRETATION**

**Units:**
mg

**Reference Interval:**
>250 mg (50%) excretion

**Additional Information:**
PABA is the end-product measured in the Bentiromide test for pancreatic insufficiency. This test is NOT accurate if the creatinine exceeds 2.0 mg/dL, and a false-negative result may be obtained due to drug and/or dietary interference.

**ADMINISTRATIVE**

**CPT Codes:**
84311-90

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)

**Performing Lab:**
National Medical Service via Quest

**Sendout:**
Yes

**Methodology:**
Solid phase

**Patient Preparation:**
Any pancreatic enzyme supplements should be discontinued for 5 days before testing of an adult, for 1 day in a child with cystic fibrosis.

An 8 hour fast before specimen collection is preferred.

**Remarks:**
The patient should be given Bentiromide after an overnight fast (500 mg for an adult or 14 mg/kg for a child) and the urine collected for the next 6 hours.

Refrigerate container during collection.

**Collect:**
24 hour urine collection container

**Amount to Collect:**
Entire urine output over 6 hour period

**Sample Type:**
6 hour urine

**Preferred Volume:**
10 mL urine

**Minimum Volume:**
1 mL urine

**Unacceptable Conditions:**
Container not refrigerated during collection.

**Specimen Preparation:**
Record total urine volume. Refrigerate sample. Order Quest # 4927X

**Units:**
mg
Reference Interval:

>250 mg (50%) excretion

Synonyms:
- PABA

Additional Information:

PABA is the end-product measured in the Bentiromide test for pancreatic insufficiency. This test is NOT accurate if the creatinine exceeds 2.0 mg/dL, and a false-negative result may be obtained due to drug and/or dietary interference.

CPT Codes:

84311-90
Paracoccidioides Serology
MOLT

ORDERING

Available Stat:
No
Performing Lab:
LabCorp
Methodology:
Immunodiffusion
Reported:
5-7 days
Additional Information:
For diagnosis of infection due to Paracoccidioides brasiliensis. Cross-reactions at low titer may occur with other fungal infections. A rise in titer is significant, the titer correlating with the severity of disease.

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
3 mL blood
Preferred Volume:
1.5 mL serum
Minimum Volume:
1 mL serum
Stability (from collection to initiation):
Refrigerated 3 days, frozen 1 week

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
LabCorp
Specimen Preparation:
Order LabCorp test # 138452
Preferred Volume:
1.5 mL serum
Minimum Volume:
1 mL serum
Stability (from collection to initiation):
Refrigerated 3 days, frozen 1 week

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
For diagnosis of infection due to Paracoccidioides brasiliensis. Cross-reactions at low titer may occur with other fungal infections. A rise in titer is significant, the titer correlating with the severity of disease.

CPT Codes:
86671-90

Complete View

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
LabCorp

Sendout:
Yes

Methodology:
Immunodiffusion

Collect:
Gold top

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
1.5 mL serum

Minimum Volume:
1 mL serum

Specimen Preparation:
Order LabCorp test # 138452

Reference Interval:
Negative

Stability (from collection to initiation):
Refrigerated 3 days, frozen 1 week

Reported:
5-7 days

Additional Information:
For diagnosis of infection due to Paracoccidioides brasiliensis. Cross-reactions at low titer may occur with other fungal infections. A rise in titer is significant, the titer correlating with the severity of disease.

CPT Codes:
86671-90
# Parainfluenza Antibodies

**PFL1**

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Complement fixation

**Reported:**
- Set up 5 days a week. Turnaround time 4-7 days.

**Additional Information:**
- Includes testing for Parainfluenza types 1, 2 and 3
- Single antibody titers of $\geq 1:64$ are indicative of recent infection. Titers of $1:8$ to $1:32$ may be indicative of either past or recent infection, since CF antibody levels persist for only a few months.
- A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.
- After initial infection, antibody responses at a later date are often heterotypic and exhibit crossreactivity with other paramyxoviruses (e.g., mumps).

**Synonyms:**
- Paraflu

## COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top or Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Stability (from collection to initiation):**
- Room temperature 7 days, refrigerated 17 days, frozen at -20°C 1 month

**Unacceptable Conditions:**
- Hemolysis

**Rejection Criteria:**
- Hemolysis

## PROCESSING

**Test Code:**
- PFL1

**Sendout:**
- Yes

**Performing Lab:**
- Quest
Specimen Preparation:
Refrigerate serum at 4C. Order Quest test #5157N

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
- Hemolysis

Rejection Criteria:
- Hemolysis

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 17 days, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
- Titer

Reference Interval:
- Negative: < 1:8 titer

Additional Information:
Includes testing for Parainfluenza types 1, 2 and 3

Single antibody titers of >= 1:64 are indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months.

A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.

After initial infection, antibody responses at a later date are often heterotypic and exhibit crossreactivity with other paramyxoviruses (e.g., mumps).

ADMINISTRATIVE

CPT Codes:
- 86790-90 x 3

LOINC Codes:
- 49713-1

COMPLETE VIEW

Available Stat:
- No

Test Code:
- PFL1

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Complement fixation

Collect:
- Red top or Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Rejection Criteria:**
Hemolysis

**Unacceptable Conditions:**
Hemolysis

**Specimen Preparation:**
Refrigerate serum at 4°C. Order Quest test #5157N

**Units:**
Titer

**Reference Interval:**
Negative: < 1:8 titer

**Synonyms:**
- Paraflu

**Stability (from collection to initiation):**
Room temperature 7 days, refrigerated 17 days, frozen at -20°C 1 month

**Reported:**
Set up 5 days a week. Turnaround time 4-7 days.

**Additional Information:**
Includes testing for Parainfluenza types 1, 2 and 3

Single antibody titers of >= 1:64 are indicative of recent infection. Titers of 1:8 to 1:32 may be indicative of either past or recent infection, since CF antibody levels persist for only a few months.

A four-fold or greater increase in titer between acute and convalescent specimens confirms the diagnosis.

After initial infection, antibody responses at a later date are often heterotypic and exhibit crossreactivity with other paramyxoviruses (e.g., mumps).

**CPT Codes:**
86790-90 x 3

**LOINC Codes:**
49713-1
Paraneoplastic Antibody Evaluation, CSF
PAECSF

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
IFA
Reported:
1-2 weeks
Reflex Testing:
Additional testing may be initiated based on results of initial immunofluorescent screening assays and separately charged.
Synonyms:
- Antineuronal Nuclear Antibody-Type 1
- ANNA-1
- Antineuronal Nuclear Antibody-Type 2
- ANNA-2
- Antineuronal Nuclear Antibody-Type 3
- ANNA-3
- Anti-Glia-neuronal Nuclear Antibody-Type 1
- AGNA-1
- Purkinje Cell Cytoplasmic Antibody-Type 1
- PCA-1
- Purkinje Cell Cytoplasmic Antibody-Type 2
- PCA-2
- Purkinje Cell Cytoplasmic Antibody-Type Tr
- PCA-Tr
- Amphiphysin Antibody
- CRMP-5-IgG

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
4 mL CSF
Preferred Volume:
4 mL CSF
Minimum Volume:
3 mL CSF
Stability (from collection to initiation):
Room temperature 3 days, frozen 2 weeks.
Test Code: PAECSF
Test Group: Paraneoplastic antibodies
Sendout: Yes
Performing Lab: Mayo
Specimen Preparation: Freeze CSF and ship frozen to China Basin
Preferred Volume: 4 mL CSF
Minimum Volume: 3 mL CSF
Stability (from collection to initiation): Room temperature 3 days, frozen 2 weeks.

RESULT INTERPRETATION

Units:
Titer
Reference Interval:

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Titer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antineuronal Nuclear Antibody-Type 1 (ANNA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Antineuronal Nuclear Antibody-Type 2 (ANNA-2)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Antineuronal Nuclear Antibody-Type 3 (ANNA-3)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Anti-Glia/Neuronal Nuclear Antibody, Type 1 (AGNA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type 1 (PCA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type 2 (PCA-2)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type Tr (PCA-Tr)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Amphiphysin Antibody</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>CRMP-5-IgG</td>
<td>Negative at &lt;1:2</td>
</tr>
</tbody>
</table>

Note: Titers lower than 1:2 are detectable by recombinant CRMP-5 Western blot analysis. CRMP-5 Western blot analysis will be done on request on stored spinal fluid (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy. Call the Neuroimmunology Laboratory at 800-533-1710 or 507-266-5700 to request CRMP-5 Western blot.

ADMINISTRATIVE

CPT Codes:
86256-90 x 9, 84182-90 x 3, 86255-90, 86341-90

COMPLETE VIEW

Available Stat: No
Test Code: PAECSF
Test Group: Paraneoplastic antibodies
Performing Lab: Mayo
Sendout: Yes
Methodology:

IFA

Collect:

CSF tube or sterile collection tube

Amount to Collect:

4 mL CSF

Sample Type:

CSF

Preferred Volume:

4 mL CSF

Minimum Volume:

3 mL CSF

Specimen Preparation:

Freeze CSF and ship frozen to China Basin

Units:

Titer

Reference Interval:

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Titer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antineuronal Nuclear Antibody-Type 1 (ANNA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Antineuronal Nuclear Antibody-Type 2 (ANNA-2)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Antineuronal Nuclear Antibody-Type 3 (ANNA-3)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Anti-Glia/Neuronal Nuclear Antibody, Type 1 (AGNA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type 1 (PCA-1)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type 2 (PCA-2)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Purkinje Cell Cytoplasmic Antibody, Type Tr (PCA-Tr)</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
<td>Amphiphysin Antibody</td>
<td>Negative at &lt;1:2</td>
</tr>
<tr>
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<td>Negative at &lt;1:2</td>
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Note: Titers lower than 1:2 are detectable by recombinant CRMP-5 Western blot analysis. CRMP-5 Western blot analysis will be done on request on stored spinal fluid (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy. Call the Neuroimmunology Laboratory at 800-533-1710 or 507-266-5700 to request CRMP-5 Western blot.

Synonyms:

- Antineuronal Nuclear Antibody-Type 1
- ANNA-1
- Antineuronal Nuclear Antibody-Type 2
- ANNA-2
- Antineuronal Nuclear Antibody-Type 3
- ANNA-3
- Anti-Glia/neuronal Nuclear Antibody-Type 1
- AGNA-1
- Purkinje Cell Cytoplasmic Antibody-Type 1
- PCA-1
- Purkinje Cell Cytoplasmic Antibody-Type 2
- PCA-2
- Purkinje Cell Cytoplasmic Antibody-Type Tr
- PCA-Tr
- Amphiphysin Antibody
- CRMP-5-IgG

Stability (from collection to initiation):

Room temperature 3 days, frozen 2 weeks.

Reported:
1-2 weeks

**Reflex Testing:**
Additional testing may be initiated based on results of initial immunofluorescent screening assays and separately charged.

**CPT Codes:**
86256-90 x 9, 84182-90 x 3, 86255-90, 86341-90
Paraneoplastic Antibody Evaluation, Serum
PAE

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
IFA, RIA, EIA
Reported:
3-4 weeks
Additional Information:
Please note: Please do not order this test if you are also ordering the Autoimmune Encephalopathy Panel (test code: ENCES), as the Paraneoplastic Antibody Evaluation test is already a component of the ENCES panel.

Reflex Testing:
Additional testing may be initiated based on results of initial immunofluorescent screening assays and separately charged.

Synonyms:
- Antineuronal Nuclear Antibody-Type 1
- ANNA-1
- Antineuronal Nuclear Antibody-Type 2
- ANNA-2
- Antineuronal Nuclear Antibody-Type 3
- ANNA-3
- Anti-Gliarial/neuronal Nuclear Antibody-Type 1
- AGNA-1
- Purkinje Cell Cytoplasmic Antibody-Type 1
- PCA-1
- Purkinje Cell Cytoplasmic Antibody-Type 2
- PCA-2
- Purkinje Cell Cytoplasmic Antibody-Type Tr
- PCA-Tr
- Amphiphysin Antibody
- CRMP-5-IgG

COLLECTION

Sample Type:
Serum
Collect:
Red top, Gold top
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
2 mL serum
Stability (from collection to initiation):
Room temperature 3 days, refrigerated or frozen 4 weeks.
PROCESSING

Test Code:
PAE

Test Group:
Paraneoplastic antibodies

Sendout:
Yes

Performing Lab:
Mayo

Specimen Preparation:
Refrigerate serum and ship to China Basin refrigerated. Do not freeze. Should be shipped same day as collection.

Preferred Volume:
3 mL serum

Minimum Volume:
2 mL serum

Stability (from collection to initiation):
Room temperature 3 days, refrigerated or frozen 4 weeks.

RESULT INTERPRETATION

Units:
Titer

Reference Interval:

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Titer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antineuronal Nuclear Antibody-Type 1 (ANNA-1)</td>
<td>&lt;1:240</td>
</tr>
<tr>
<td>Antineuronal Nuclear Antibody-Type 2 (ANNA-2)</td>
<td>&lt;1:240</td>
</tr>
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</tr>
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<td>&lt;1:240</td>
</tr>
<tr>
<td>CRMP-5-IgG</td>
<td>&lt;1:240*</td>
</tr>
<tr>
<td>Striational (Striated Muscle) Antibodies</td>
<td>&lt;1:60</td>
</tr>
<tr>
<td>N-Type Calcium Channel Antibody</td>
<td>&lt;= 0.03 nmol/L</td>
</tr>
<tr>
<td>P/Q-Type Calcium Channel Antibody</td>
<td>&lt;= 0.02 nmol/L</td>
</tr>
<tr>
<td>ACh Receptor (Muscle) Binding Antibody</td>
<td>&lt;= 0.02 nmol/L</td>
</tr>
<tr>
<td>AChR Ganglionic Neuronal Antibody</td>
<td>&lt;= 0.02 nmol/L</td>
</tr>
<tr>
<td>Neuronal VGKC Autoantibody</td>
<td>&lt;= 0.02 nmol/L</td>
</tr>
</tbody>
</table>

*Note: Titers lower than 1:240 are detectable by recombinant CRMP-5 Western blot analysis. CRMP-5 Western blot analysis will be done on request on stored serum (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy. Call the Neuroimmunology Laboratory at 800-533-1710 or 507-266-5700 to request CRMP-5 Western blot.

Neuron-restricted patterns of IgG staining that do not fulfill criteria for amphiphysin, ANNA-1, ANNA-2, ANNA-3, AGNA-1, PCA-1, PCA-2, PCA-Tr, or CRMP-5-IgG may be reported as “unclassified antineuronal IgG.” Complex patterns that include non-neuronal elements may be reported as “uninterpretable.”

Additional Information:
Please note: Please do not order this test if you are also ordering the Autoimmune Encephalopathy Panel (test code: ENCES), as the Paraneoplastic Antibody Evaluation test is already a component of the ENCES panel.

ADMINISTRATIVE

CPT Codes:
Available Stat: No
Test Code: PAE
Test Group: Paraneoplastic antibodies
Performing Lab: Mayo
Sendout: Yes
Methodology: IFA, RIA, EIA
Collect: Red top, Gold top
Amount to Collect: 6 mL blood
Sample Type: Serum
Preferred Volume: 3 mL serum
Minimum Volume: 2 mL serum
Specimen Preparation:
Refrigerate serum and ship to China Basin refrigerated. Do not freeze. Should be shipped same day as collection.

Units:
Titer
Reference Interval:

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<td>Neuronal VGKC Autoantibody</td>
<td>&lt;= 0.02 nmol/L</td>
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*Note: Titers lower than 1:240 are detectable by recombinant CRMP-5 Western blot analysis. CRMP-5 Western blot analysis will be done on request on stored serum (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy. Call the Neuroimmunology Laboratory at 800-533-1710 or 507-266-5700 to request CRMP-5 Western blot.

Neuron-restricted patterns of IgG staining that do not fulfill criteria for amphiphysin, ANNA-1, ANNA-2, ANNA-3, AGNA-1, PCA-1, PCA-2, PCA-Tr, or CRMP-5-IgG may be reported as "unclassified antineuronal IgG." Complex patterns that include non-neuronal elements may be reported as "uninterpretable."

Synonyms:
Antineuronal Nuclear Antibody-Type 1
• ANNA-1
Antineuronal Nuclear Antibody-Type 2
• ANNA-2
Antineuronal Nuclear Antibody-Type 3
• ANNA-3
Anti-Glia/neuronal Nuclear Antibody-Type 1
• AGNA-1
Purkinje Cell Cytoplasmic Antibody-Type 1
• PCA-1
Purkinje Cell Cytoplasmic Antibody-Type 2
• PCA-2
Purkinje Cell Cytoplasmic Antibody-Type Tr
• PCA-Tr
Amphiphysin Antibody
• CRMP-5-IgG

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated or frozen 4 weeks.

**Reported:**
3-4 weeks

**Reflex Testing:**
Additional testing may be initiated based on results of initial immunofluorescent screening assays and separately charged.

**Additional Information:**
Please note: Please do not order this test if you are also ordering the Autoimmune Encephalopathy Panel (test code: ENCES), as the Paraneoplastic Antibody Evaluation test is already a component of the ENCES panel.

**CPT Codes:**
83519-90 x 5, 83520-90, 86256-90 x 9
Parasite identification
P404

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift
Reported:
1-3 days
Additional Information:
For genus, species and stage of worm.
Scolex identification is not offered as effective therapy destroys the scolex.
Synonyms:
- Scolex

COLLECTION

Sample Type:
Worm, or proglottid
Collect:
Fresh specimen preferred on moistened gauze in clean container. Samples submitted in 70% ethanol or 10% formalin acceptable.
Stability (from collection to initiation):
Refrigerated 24 hours

PROCESSING

Test Code:
P404
Test Group:
Parasites
Performing Lab:
Microbiology
Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information:
For genus, species and stage of worm.
Scolex identification is not offered as effective therapy destroys the scolex.

ADMINISTRATIVE

CPT Codes:
87169
LOINC Codes:
673-4
Available Stat: No
Test Code: P404
Test Group: Parasites
Performing Lab: Microbiology
Performed: Monday-Friday, day shift
Collect: Fresh specimen preferred on moistened gauze in clean container. Samples submitted in 70% ethanol or 10% formalin acceptable.
Sample Type: Worm, or proglottid
Synonyms: Scolex
Stability (from collection to initiation): Refrigerated 24 hours
Reported: 1-3 days
Additional Information: For genus, species and stage of worm.
Scolex identification is not offered as effective therapy destroys the scolex.
CPT Codes: 87169
LOINC Codes: 673-4
Parasite Wet Mount
P412

ORDERING

Ordering Recommendations:
Specify suspected parasite so appropriate method can be performed.

If submitting sputum for Strongyloides, Ascaris, or Hookworm, also submit stool for Ova and Parasite exam (P401).

Performing Lab:
China Basin Microbiology

Performed:
Monday - Friday, dayshift

Methodology:
Microscopy

Reported:
1 - 3 days

Additional Information:
Liver aspirates for Entamoeba histolytica should submitted as P401 Ova and Parasite Exam.

Tissue biopsies for amebiasis should be submitted to Surgical Pathology.

Reflex Testing:
Negative direct exams may require a concentration procedure to be employed at an additional charge.

If Microfilaria are present, a Giemsa stain may be ordered at an additional charge.

Synonyms:
- Strongyloides
- Ascaris
- Hookworm
- Paragonimus
- Schistosoma haematobium
- Onchocerca
- Microfilaria
- Echinococcus
- Hydatid cyst

COLLECTION

Sample Type:
Urine, sputum, BAL, skin snips

Liver aspirates and hydatid cyst fluid may be submitted for Echinococcus detection.

Bladder or Rectal biopsy for determining viability of Schistosoma eggs and need for therapy.

Collect:
Sterile container (24 hour urine container for S. haematobium)

Amount to Collect:
See Preferred Volume.

Preferred Volume:
- Sputum or BAL: 2 - 5 ml
- Skin snips: 6 snips each 2 - 3 mm in diameter

Minimum Volume:
- Sputum or BAL: 2 ml
Remarks:

Urine for Schistosoma haematobium: Collect all urine voided between 1000 - 1400 (peak egg excretion).

For microfilaria (Onchocerca volvulus), submit skin snips taken from an affected area or from scapular, gluteal, calf areas (African form), or from scapular, gluteal, deltoid areas (Central American form). Collect samples using a corneoscleral punch or by lifting the skin with a needle point and excising epidermis and dermis with a razor. Place each snip in a separate container with a small amount of physiologic saline.

Stability (from collection to initiation):

1 - 2 days

Skin snips and tissue biopsies should be read on the day of collection whenever possible.

Storage/Transport Temperature:

Urine, sputum and BAL should be refrigerated.

Skin snips should be placed in a 35 degree incubator if received after hours.

PROCESSING

Test Code:
P412

Test Group:
Parasitology

Performing Lab:
China Basin Microbiology

Specimen Preparation:
If urine for S. haematobium cannot be examined within 72 hours, add 2 ml undiluted household bleach to each 100ml of specimen prior to refrigeration.

Preferred Volume:
Sputum or BAL: 2 - 5 ml

Skin snips: 6 snips each 2 - 3 mm in diameter

Minimum Volume:
Sputum or BAL: 2 ml

Stability (from collection to initiation):
1 - 2 days

Skin snips and tissue biopsies should be read on the day of collection whenever possible.

Storage/Transport Temperature:
Urine, sputum and BAL should be refrigerated.

Skin snips should be placed in a 35 degree incubator if received after hours.

RESULT INTERPRETATION

Reference Interval:
No parasites seen.

Additional Information:
Liver aspirates for Entamoeba histolytica should submitted as P401 Ova and Parasite Exam.

Tissue biopsies for amebiasis should be submitted to Surgical Pathology.

ADMINISTRATIVE

CPT Codes:
87210

LOINC Codes:
33017-5
Ordering Recommendations:
   Specify suspected parasite so appropriate method can be performed.

   If submitting sputum for Strongyloides, Ascaris, or Hookworm, also submit stool for Ova and Parasite exam (P401).

Test Code:
   P412

Test Group:
   Parasitology

Performing Lab:
   China Basin Microbiology

Performed:
   Monday - Friday, dayshift

Methodology:
   Microscopy

Remarks:
   Urine for Schistosoma haematobium: Collect all urine voided between 1000 - 1400 (peak egg excretion).

   For microfilaria (Onchocerca volvulus), submit skin snips taken from an affected area or from scapular, gluteal, calf areas (African form),
   or from scapular, gluteal, deltoid areas (Central American form). Collect samples using a corneoscleral punch or by lifting the skin with a
   needle point and excising epidermis and dermis with a razor. Place each snip in a separate container with a small amount of physiologic
   saline.

Collect:
   Sterile container (24 hour urine container for S. haematobium)

Amount to Collect:
   See Preferred Volume.

Sample Type:
   Urine, sputum, BAL, skin snips

   Liver aspirates and hydatid cyst fluid may be submitted for Echinococcus detection.

   Bladder or Rectal biopsy for determining viability of Schistosoma eggs and need for therapy.

Preferred Volume:
   Sputum or BAL: 2 - 5 ml

   Skin snips: 6 snips each 2 - 3 mm in diameter

Minimum Volume:
   Sputum or BAL: 2 ml

Specimen Preparation:
   If urine for S. haematobium cannot be examined within 72 hours, add 2 ml undiluted household bleach to each 100ml of specimen prior
   to refrigeration.

Reference Interval:
   No parasites seen.

Synonyms:
   - Strongyloides
   - Ascaris
   - Hookworm
   - Paragonimus
   - Schistosoma haematobium
   - Onchocerca
   - Microfilaria
   - Echinococcus
   - Hydatid cyst
Storage/Transport Temperature:
   Urine, sputum and BAL should be refrigerated.

   Skin snips should be placed in a 35 degree incubator if received after hours.

Stability (from collection to initiation):
   1-2 days

   Skin snips and tissue biopsies should be read on the day of collection whenever possible.

Reported:
   1-3 days

Reflex Testing:
   Negative direct exams may require a concentration procedure to be employed at an additional charge.

   If Microfilaria are present, a Giemsa stain may be ordered at an additional charge.

Additional Information:
   Liver aspirates for Entamoeba histolytica should submitted as P401 Ova and Parasite Exam.

   Tissue biopsies for amebiasis should be submitted to Surgical Pathology.

CPT Codes:
   87210

LOINC Codes:
   33017-5
### Parasites, blood

#### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Microbiology

**Performed:**
- Malaria: Stat: Daily all shifts
- Other parasites: Monday-Friday, day shift

**Additional Information:**
- see Filaria, Leishmania, Malaria and Trypanosoma

#### COLLECTION

**Sample Type:**
- EDTA whole blood

**Collect:**
- Lavender top

**Amount to Collect:**
- 3 mL blood

**Stability (from collection to initiation):**
- Room temperature 24 hours

#### PROCESSING

**Test Group:**
- Parasites

**Performing Lab:**
- Microbiology

**Stability (from collection to initiation):**
- Room temperature 24 hours

#### RESULT INTERPRETATION

**Critical Values:**
- Positive smear

**Additional Information:**
- see Filaria, Leishmania, Malaria and Trypanosoma

#### COMPLETE VIEW

**Available Stat:**
- No

**Test Group:**
- Parasites

**Performing Lab:**
- Microbiology

**Performed:**
- Malaria: Stat: Daily all shifts
- Other parasites: Monday-Friday, day shift

**Collect:**
- 

Test information subject to change
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Critical Values:
Positive smear

Stability (from collection to initiation):
Room temperature 24 hours

Additional Information:
see Filaria, Leishmania, Malaria and Trypanosoma
Parasites, Respiratory
P412, P407, P414, P403

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift
Methodology:
Wet mount, Acid-fast smear, Modified trichrome smear, Giemsa stain as appropriate
Reported:
1-3 days
Additional Information:
Parasites and methods of detection:
Ascaris lumbricoides larva, Echinococcus, Paragonimus, and Strongyloides stercoralis detected by wet mount.
Cryptosporidium detected by acid fast smear.
Microsporidia detected by modified Trichrome stain.
Toxoplasma gondii detected by Giemsa stain.
A concentration procedure will be performed on sputum if appropriate, and at an additional charge.

COLLECTION

Sample Type:
Sputum, BAL
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
5 mL BAL or sputum
Minimum Volume:
2 mL BAL or sputum
Remarks:
Specify suspected parasite so appropriate method can be performed. For suspected Strongyloides stercoralis infection, submit stool as well.
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
Wet Mount (P412), Coccidia Exam (P407), Microsporidium Stain (P414), Intracellular Parasite Stain (P403)
Test Group:
Parasites
Performing Lab:
Microbiology
Specimen Preparation:
Refrigerate sample

**Preferred Volume:**
- 5 mL BAL or sputum

**Minimum Volume:**
- 2 mL BAL or sputum

**Stability (from collection to initiation):**
- Refrigerated 2 days

---

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative

**Additional Information:**
- Parasites and methods of detection:
  - Ascaris lumbricoides larva, Echinococcus, Paragonimus, and Strongyloides stercoralis detected by wet mount.
  - Cryptosporidium detected by acid fast smear.
  - Microsporidia detected by modified Trichrome stain.
  - Toxoplasma gondii detected by Giemsa stain.
  - A concentration procedure will be performed on sputum if appropriate, and at an additional charge.

---

**ADMINISTRATIVE**

**CPT Codes:**
- Wet Mount (87210), Coccidia Exam (87206), Microsporidium Stain (87207), Intracellular Parasite Stain (87207)

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- Wet Mount (P412), Coccidia Exam (P407), Microsporidium Stain (P414), Intracellular Parasite Stain (P403)

**Test Group:**
- Parasites

**Performing Lab:**
- Microbiology

**Performed:**
- Monday-Friday, day shift

**Methodology:**
- Wet mount, Acid-fast smear, Modified trichrome smear, Giemsa stain as appropriate

**Remarks:**
- Specify suspected parasite so appropriate method can be performed. For suspected Strongyloides stercoralis infection, submit stool as well.

**Collect:**
- Urine cup

**Amount to Collect:**
- See preferred volume

**Sample Type:**
- Sputum, BAL

**Preferred Volume:**
- 5 mL BAL or sputum

**Minimum Volume:**
2 mL BAL or sputum

**Specimen Preparation:**
- Refrigerate sample

**Reference Interval:**
- Negative

**Stability (from collection to initiation):**
- Refrigerated 2 days

**Reported:**
- 1-3 days

**Additional Information:**
- Parasites and methods of detection:
  - Ascaris lumbricoides larva, Echinococcus, Paragonimus, and Strongyloides stercoralis detected by wet mount.
  - Cryptosporidium detected by acid fast smear.
  - Microsporidia detected by modified Trichrome stain.
  - Toxoplasma gondii detected by Giemsa stain.

- A concentration procedure will be performed on sputum if appropriate, and at an additional charge.

**CPT Codes:**
- Wet Mount (87210), Coccidia Exam (87206), Microsporidium Stain (87207), Intracellular Parasite Stain (87207)
**Parathormone Related Protein**

**PTHRP**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Mayo

**Methodology:**
- Immunochemiluminometric assay

**Reported:**
- Performed Monday - Thursday, turnaround time 3-7 days.

**Synonyms:**
- PTH related protein
- Parathyroid hormone related protein

### COLLECTION

**Sample Type:**
- EDTA Plasma

**Collect:**
- Lavender top (on ice)

**Amount to Collect:**
- 1.5 mL blood

**Preferred Volume:**
- 0.7 mL plasma

**Minimum Volume:**
- 0.25 mL plasma

**Remarks:**
- Pre-chill lavender top tube prior to collection in ice-water slurry. Deliver sample immediately to lab on ice for processing.

**Stability (from collection to initiation):**
- Frozen 3 months.

**Rejection Criteria:**
- Whole blood or thawed plasma received

### PROCESSING

**Test Code:**
- PTHRP

**Sendout:**
- Yes

**Performing Lab:**
- Mayo

**Specimen Preparation:**
- Centrifuge for at least 15 minutes. Transfer the plasma to a plastic transport tube, freeze sample and ship at frozen to China Basin Sendouts.

**Preferred Volume:**
- 0.7 mL plasma

**Minimum Volume:**
- 0.25 mL plasma

**Rejection Criteria:**
- Whole blood or thawed plasma received
Stability (from collection to initiation):
  Frozen 3 months.

RESULT INTERPRETATION

Units:
  pmol/L
Reference Interval:
  <= 4.2 pmol/L

ADMINISTRATIVE

CPT Codes:
  82397-90
LOINC Codes:
  2729-2

COMPLETE VIEW

Available Stat:
  No
Test Code:
  PTHRP
Performing Lab:
  Mayo
Sendout:
  Yes
Methodology:
  Immunochemiluminometric assay
Remarks:
  Pre-chill lavender top tube prior to collection in ice-water slurry. Deliver sample immediately to lab on ice for processing.
Collect:
  Lavender top (on ice)
Amount to Collect:
  1.5 mL blood
Sample Type:
  EDTA Plasma
Preferred Volume:
  0.7 mL plasma
Minimum Volume:
  0.25 mL plasma
Rejection Criteria:
  Whole blood or thawed plasma received
Specimen Preparation:
  Centrifuge for at least 15 minutes. Transfer the plasma to a plastic transport tube, freeze sample and ship at frozen to China Basin Sendouts.
Units:
  pmol/L
Reference Interval:
  <= 4.2 pmol/L
Synonyms:
  • PTH related protein
  • Parathyroid hormone related protein
Stability (from collection to initiation):
  Printed 06/07/19
  Test information subject to change
Frozen 3 months.

**Reported:**
- Performed Monday - Thursday, turnaround time 3-7 days.

**CPT Codes:**
- 82397-90

**LOINC Codes:**
- 2729-2
Parathormone, Body fluid (FNA)
PTHB

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Monday, Wednesday, Friday day shift only

Methodology:
Chemiluminescent Immunoassay (Siemens Immulite 2000)

Reported:
1-3 days

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

Assay for intact PTH in "neck" or "thyroid" cytology aspirates may be helpful in determining presence of inadvertently sampled parathyroid adenoma tissue. In aspirate samples of parathyroid adenomas, the ratio of PTH in the aspirate samples versus in serum is typically > 3 even without accounting for dilution of the aspirate sample (Owens CL et al. Diagnostic Cytopathology 26:227-231, 2008).

Synonyms:
- PTH FNA
- Parathyroid hormone

COLLECTION

Sample Type:
FNA fluid or tissue aspirate

Collect:
Sterile tube (see collection instructions)

Amount to Collect:
0.5 mL (see collection instructions)

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.5 mL fluid

Remarks:
Submit each FNA sample suspended in 0.5 mL (10 drops) of saline in a sterile tube. Each sample should be labeled with an identifier and the same information listed below to allow for proper identification of sample(s) on lab reports.

Deliver immediately to laboratory

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated unacceptable, frozen at -20C 1 week.

PROCESSING

Test Code:
PTHB

Test Group:
Parathormone

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Centrifuge sample in refrigerated centrifuge and freeze in original tube at -20C.

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.5 mL fluid

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated unacceptable, frozen at -20C 1 week.

RESULT INTERPRETATION

Units:
ng/L

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

Assay for intact PTH in "neck" or "thyroid" cytology aspirates may be helpful in determining presence of inadvertently sampled parathyroid adenoma tissue. In aspirate samples of parathyroid adenomas, the ratio of PTH in the aspirate samples versus in serum is typically > 3 even without accounting for dilution of the aspirate sample (Owens CL et al. Diagnostic Cytopathology 26:227-231, 2008).

ADMINISTRATIVE

CPT Codes:
83970

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Not a routinely available test. See ‘Additional information’

Test Code:
PTHB

Test Group:
Parathormone

Performing Lab:
China Basin Chemistry

Performed:
Monday, Wednesday, Friday day shift only

Methodology:
Chemiluminescent Immunoassay (Siemens Immulite 2000)

Remarks:
Submit each FNA sample suspended in 0.5 mL (10 drops) of saline in a sterile tube. Each sample should be labeled with an identifier and the same information listed below to allow for proper identification of sample(s) on lab reports.

Deliver immediately to laboratory
Collect:
Sterile tube (see collection instructions)

Amount to Collect:
0.5 mL (see collection instructions)

Sample Type:
FNA fluid or tissue aspirate

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.5 mL fluid

Specimen Preparation:
Centrifuge sample in refrigerated centrifuge and freeze in original tube at -20C.

Units:
ng/L

Synonyms:
- PTH FNA
- Parathyroid hormone

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated unacceptable, frozen at -20C 1 week.

Reported:
1-3 days

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

Assay for intact PTH in "neck" or "thyroid" cytology aspirates may be helpful in determining presence of inadvertently sampled parathyroid adenoma tissue. In aspirate samples of parathyroid adenomas, the ratio of PTH in the aspirate samples versus in serum is typically > 3 even without accounting for dilution of the aspirate sample (Owens CL et al. Diagnostic Cytopathology 26:227-231, 2008).

CPT Codes:
83970
Parathormone, intact
PTH, PTHI

ORDERING

Performing Lab:
China Basin Chemistry

Performed:
Sunday, Tuesday, Thursday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
1-3 days

Additional Information:
A serum calcium is automatically ordered and charged on the same specimen or group of specimens.

Synonyms:
- PTH
- Parathyroid hormone

COLLECTION

Sample Type:
Plasma/Serum

Collect:
Preferred: Light Green Top (Lithium Heparin)
Acceptable: Lavender Top (K-EDTA) or Gold Top (SST)

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma/serum

Minimum Volume:
0.3 mL plasma/serum

Remarks:
Transport promptly to laboratory.

Stability (from collection to initiation):
Refrigerated (2-8°C): <= 2 days
Frozen (-20°C): 6 months

Testing permitted on primary tube specimen if refrigerated sample is <= 48 hours old.

Avoid more than 5 freeze-thaw cycles.

PROCESSING

Test Code:
PTH (PTHI for additional samples)

Test Group:
Parathormone

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Centrifuge within 6 hours of collection, aliquot, and freeze immediately at -20°C.

Preferred Volume:
0.5 mL plasma/serum
**Minimum Volume:**
0.3 mL plasma/serum

**Stability (from collection to initiation):**
Refrigerated (2-8°C): <= 2 days
Frozen (-20°C): 6 months

Testing permitted on primary tube specimen if refrigerated sample is <= 48 hours old.
Avoid more than 5 freeze-thaw cycles.

**RESULT INTERPRETATION**

**Units:**
ng/L

**Reference Interval:**
Adult Reference Range (>= 18 years): 18 to 90 ng/L

Reference range adopted from literature references (see below) and verified in-house using 57 normal volunteers in the UCSF Laboratory.

Am J Clin Pathol. 2010;134:930-8. Performance characteristics of six intact parathyroid hormone assays. La'ulu SL1, Roberts WL.


<table>
<thead>
<tr>
<th>Pediatric Reference Range:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>6 days - &lt; 1 year</td>
</tr>
<tr>
<td>1 year - &lt; 9 years</td>
</tr>
<tr>
<td>9 years - &lt; 18 years</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

**Additional Information:**
A serum calcium is automatically ordered and charged on the same specimen or group of specimens.

**Interpretive Data:**

In normal subjects, the Abbott Architect assay reads approximately 20 ng/L (pg/mL) higher on average than the Siemens Immulite 2000 assay. For patients with elevated PTH values, the Architect assay reads approximately 15-20% higher on average than the Immulite assay. The normal reference range for PTH has been adjusted upwards and is 18-90 in the Architect assay compared with 12-65 in the old Immulite assay.

The value of the ARCHITECT Intact PTH Calibrators are established against a set of Internal Reference Calibrators, which are traceable to the World Health Organization's first international standard for PTH from the NIBSC, code 79/500.

**ADMINISTRATIVE**

**CPT Codes:**
83970; 82310

**COMPLETE VIEW**

**Test Code:**
PTH (PTHI for additional samples)

**Test Group:**
Parathormone
Performing Lab:  
China Basin Chemistry

Performed:  
Sunday, Tuesday, Thursday (day shift)

Methodology:  
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Remarks:  
Transport promptly to laboratory.

Collect:  
Preferred: Light Green Top (Lithium Heparin)  
Acceptable: Lavender Top (K-EDTA) or Gold Top (SST)

Amount to Collect:  
1 mL blood

Sample Type:  
Plasma/Serum

Preferred Volume:  
0.5 mL plasma/serum

Minimum Volume:  
0.3 mL plasma/serum

Specimen Preparation:  
Centrifuge within 6 hours of collection, aliquot, and freeze immediately at -20°C.

Units:  
ng/L

Reference Interval:  
Adult Reference Range (>= 18 years): 18 to 90 ng/L

Reference range adopted from literature references (see below) and verified in-house using 57 normal volunteers in the UCSF Laboratory.

Am J Clin Pathol. 2010;134:930-8. Performance characteristics of six intact parathyroid hormone assays. La'ulu SL1, Roberts WL.


Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Result (ng/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 days - &lt; 1 year</td>
<td>6 - 89</td>
</tr>
<tr>
<td>1 year - &lt; 9 years</td>
<td>16 - 63</td>
</tr>
<tr>
<td>9 years - &lt; 18 years</td>
<td>22 - 88</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Interpretive Data:  

In normal subjects, the Abbott Architect assay reads approximately 20 ng/L (pg/mL) higher on average than the Siemens Immulite 2000 assay. For patients with elevated PTH values, the Architect assay reads approximately 15-20% higher on average than the Immulite assay. The normal reference range for PTH has been adjusted upwards and is 18-90 in the Architect assay compared with 12-65 in the old Immulite assay.

The value of the ARCHITECT Intact PTH Calibrators are established against a set of Internal Reference Calibrators, which are traceable to the World Health Organization's first international standard for PTH from the NIBSC, code 79/500.

Synonyms:  
- PTH  
- Parathyroid hormone

Stability (from collection to initiation):  
Refrigerated (2-8°C): <= 2 days
Frozen (-20°C): 6 months

Testing permitted on primary tube specimen if refrigerated sample is <= 48 hours old.

Avoid more than 5 freeze-thaw cycles.

**Reported:**

1-3 days

**Additional Information:**

A serum calcium is automatically ordered and charged on the same specimen or group of specimens.

**CPT Codes:**

83970; 82310
Parathormone, Intraoperative
PTHPR, PTHPO

ORDERING

Available Stat:
No

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Parnassus: 0800-2300
Mission Bay: 0800-2300
Mount Zion: 0730-1900

Methodology:
Parnassus: Beckman DXI 600 Immunoassay
Mission Bay: Beckman DXI 600 Immunoassay
Mount Zion: Beckman Access2 Immunoassay

Reported:
15-30 min

Additional Information:
NOTE: Samples must be accompanied by the appropriate paper requisition:

- For Parnassus [click here].
- For Mission Bay [click here].
- For Mt. Zion [click here].

This test is not applicable for diagnosis and is used solely as an aid in determining the adequacy of parathyroidectomy in patients with hyperparathyroidism. Measures intact PTH molecule.

Samples are taken at baseline (prior to gland manipulation or removal) and again after resection. A > 50% decrease from baseline suggests adequate parathyroid gland tissue has been resected.

Failure to achieve a > 50% decrease after tissue removal suggests additional hyperfunctional parathyroid tissue is still present.

Patient must be on OR schedule and samples must arrive in the laboratory at Mt. Zion before 1900 hours and at Partnassus before 2300 hours in order to be tested. Samples which arrive after 1900 hours at Mount Zion and 2300 hours at Parnassus will be frozen and tested the next run.

Note: L Serum levels are approximately 15% higher than plasma samples

Synonyms:
- PTH
- IOPTH
- Parathyroid hormone

COLLECTION

Sample Type:
EDTA whole blood

Collect:
Lavender top

Amount to Collect:
2 mL blood

Preferred Volume:
2 mL blood

Minimum Volume:
0.5 mL blood
Remarks:

NOTE: Samples must be accompanied by the appropriate paper requisition:

- For Parnassus click here.
- For Mission Bay click here.
- For Mt. Zion click here.

Any manipulation of either normal or abnormal parathyroid glands or surrounding tissue may result in a transient rise in hormone levels; therefore at least ten minutes should elapse between gland resection or manipulation and collection of samples for testing.

Rejection Criteria:

- Sample received with needle attached.

PROCESSING

Test Code:

PTHP (Pre) & PTHPO (post)

Test Group:

Parathormone

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:

2 mL blood

Minimum Volume:

0.5 mL blood

Rejection Criteria:

Sample received with needle attached.

RESULT INTERPRETATION

Units:

ng/L

Additional Information:

NOTE: Samples must be accompanied by the appropriate paper requisition:

- For Parnassus click here.
- For Mission Bay click here.
- For Mt. Zion click here.

This test is not applicable for diagnosis and is used solely as an aid in determining the adequacy of parathyroidectomy in patients with hyperparathyroidism. Measures intact PTH molecule.

Samples are taken at baseline (prior to gland manipulation or removal) and again after resection. A > 50% decrease from baseline suggests adequate parathyroid gland tissue has been resected.

Failure to achieve a > 50% decrease after tissue removal suggests additional hyperfunctional parathyroid tissue is still present.

Patient must be on OR schedule and samples must arrive in the laboratory at Mt. Zion before 1900 hours and at Parnassus before 2300 hours in order to be tested. Samples which arrive after 1900 hours at Mount Zion and 2300 hours at Parnassus will be frozen and tested the next run.

Note: Serum levels are approximately 15% higher than plasma samples.

ADMINISTRATIVE

CPT Codes:

83970
Available Stat: 
No

Test Code:
PTHPR (Pre) & PTHPO (post)

Test Group:
Parathormone

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Parnassus: 0800-2300
Mission Bay: 0800-2300
Mount Zion: 0730-1900

Methodology:
Parnassus: Beckman DXI 600 Immunoassay
Mission Bay: Beckman DXI 600 Immunoassay
Mount Zion: Beckman Access2 Immunoassay

Remarks:
NOTE: Samples must be accompanied by the appropriate paper requisition:

- For Parnassus [click here].
- For Mission Bay [click here].
- For Mt. Zion [click here].

Any manipulation of either normal or abnormal parathyroid glands or surrounding tissue may result in a transient rise in hormone levels; therefore at least ten minutes should elapse between gland resection or manipulation and collection of samples for testing.

Collect:
Lavender top

Amount to Collect:
2 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
2 mL blood

Minimum Volume:
0.5 mL blood

Rejection Criteria:
Sample received with needle attached.

Units:
ng/L

Synonyms:
- PTH
- IOPTH
- Parathyroid hormone

Reported:
15-30 min

Additional Information:
NOTE: Samples must be accompanied by the appropriate paper requisition:

- For Parnassus [click here].
- For Mission Bay [click here].
- For Mt. Zion [click here].
This test is not applicable for diagnosis and is used solely as an aid in determining the adequacy of parathyroidectomy in patients with hyperparathyroidism. Measures intact PTH molecule.

Samples are taken at baseline (prior to gland manipulation or removal) and again after resection. A > 50% decrease from baseline suggests adequate parathyroid gland tissue has been resected.

Failure to achieve a > 50% decrease after tissue removal suggests additional hyperfunctional parathyroid tissue is still present.

Patient must be on OR schedule and samples must arrive in the laboratory at Mt. Zion before 1900 hours and at Parnassus before 2300 hours in order to be tested. Samples which arrive after 1900 hours at Mount Zion and 2300 hours at Parnassus will be frozen and tested the next run.

Note: Serum levels are approximately 15% higher than plasma samples

CPT Codes:
83970
Parathormone, Post-Surgical

ORDERING

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Parnassus: 0800 - 2300 Monday - Friday
Mt. Zion: 0730 - 1900 Monday - Friday
Methodology:
Parnassus: Beckman DxI600 Immunoassay
Mt. Zion: Beckman Access 2 Immunoassay
Reported:
2 hours
Additional Information:
Note: Serum levels are approximately 15% higher than plasma samples
Synonyms:
- PTH
- IOPTH
- Parathyroid hormone

COLLECTION

Sample Type:
EDTA Whole blood
Collect:
Lavender top
Amount to Collect:
2 mL blood
Preferred Volume:
2 mL blood
Minimum Volume:
0.5 mL blood

PROCESSING

Test Group:
Parathormone
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
2 mL blood
Minimum Volume:
0.5 mL blood

RESULT INTERPRETATION

Units:
ng/mL
Reference Interval:
12 - 65 ng/mL
Additional Information:
Note: Serum levels are approximately 15% higher than plasma samples
**ADMINISTRATIVE**

CPT Codes:

- 83970

**COMPLETE VIEW**

Test Group:
- Parathormone

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
- Parnassus: 0800 - 2300 Monday - Friday
- Mt. Zion: 0730 - 1900 Monday - Friday

Methodology:
- Parnassus: Beckman DxI600 Immunoassay
- Mt. Zion: Beckman Access 2 Immunoassay

Collect:
- Lavender top

Amount to Collect:
- 2 mL blood

Sample Type:
- EDTA Whole blood

Preferred Volume:
- 2 mL blood

Minimum Volume:
- 0.5 mL blood

Units:
- ng/mL

Reference Interval:
- 12 - 65 ng/mL

Synonyms:
- PTH
- IOPTH
- Parathyroid hormone

Reported:
- 2 hours

Additional Information:
- Note: Serum levels are approximately 15% higher than plasma samples

CPT Codes:

- 83970
Parechovirus PCR
P319

ORDERING

Available Stat:
No
Performing Lab:
Quest Diagnostics

COLLECTION

Sample Type:
Plasma
Collect:
EDTA tube (lavender top)
Amount to Collect:
0.5 mL
Preferred Volume:
0.5 mL
Minimum Volume:
0.5 mL
Stability (from collection to initiation):
Room temperature: 48 hours. Refrigerated: 7 days. Frozen: 30 days.

PROCESSING

Test Code:
P319
Sendout:
Yes
Performing Lab:
Quest Diagnostics
Specimen Preparation:
Accession as P319: If Enterovirus PCR is also requested, credit order as this test includes Enterovirus.
Centrifuge blood, and aliquot and freeze plasma at -70°C.
Send to Quest for test code 70189X Enterovirus/Parechovirus RNA, Qualitative Real-Time PCR
Preferred Volume:
0.5 mL
Minimum Volume:
0.5 mL
Stability (from collection to initiation):
Room temperature: 48 hours. Refrigerated: 7 days. Frozen: 30 days.

COMPLETE VIEW

Available Stat:
No
Test Code:
P319
Performing Lab:
Quest Diagnostics
Sendout:
Yes

Collect:
EDTA tube (lavender top)

Amount to Collect:
0.5 mL

Sample Type:
Plasma

Preferred Volume:
0.5 mL

Minimum Volume:
0.5 mL

Specimen Preparation:
Accession as P319: If Enterovirus PCR is also requested, credit order as this test includes Enterovirus.

Centrifuge blood, and aliquot and freeze plasma at -70°C.

Send to Quest for test code 70189X Enterovirus/Parechovirus RNA, Qualitative Real-Time PCR

Stability (from collection to initiation):
Room temperature: 48 hours. Refrigerated: 7 days. Frozen: 30 days.
## Paroxysmal Nocturnal Hemoglobinuria Cell Markers

**PNHM**

### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Mayo</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Flow cytometry</td>
</tr>
<tr>
<td>Reported:</td>
<td>Samples accepted Monday-Friday AM only; test run daily. Turnaround time: 2-5 days.</td>
</tr>
</tbody>
</table>

**Additional Information:**

Flow cytometric immunophenotyping is used to study the leukocyte and RBC surface markers of glycosylphosphatidylinositol (GPI) linked antigens such as CD14 (monocytes) and CD59 (neutrophils and RBC). Fluorescent aerolysin (FLAER), a protein that selectively binds to GPI anchors, is also used in the test. Patients with Paroxysmal Nocturnal Hemoglobinuria (PNH) will show abnormality in all or some of these markers to various extents.

**Synonyms:**
- PI-linked antigen
- PNH
- CD55
- CD59
- flow cytometry

### COLLECTION

<table>
<thead>
<tr>
<th>Sample Type:</th>
<th>Whole blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect:</td>
<td>Lavender top (EDTA)</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>7 mL blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>7 mL blood</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>3 mL blood</td>
</tr>
<tr>
<td>Stability (from collection to initiation):</td>
<td>Room temperature, 72 hours.</td>
</tr>
</tbody>
</table>

### PROCESSING

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>PNHM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sendout:</td>
<td>Yes</td>
</tr>
<tr>
<td>Performing Lab:</td>
<td>Mayo</td>
</tr>
</tbody>
</table>

**Specimen Preparation:**

Do not transfer sample to another container. Transport at Room temperature to China Basin to Send-outs for pick-up at 1600 hours by Medical Courier.

Order Mayo Medical Labs test code # 81156 (CPT). Send at ambient temperature Monday-Thursday, to China Basin Sendouts to meet MAYO Lab courier (MCI) pickup at 1600 hours.
If pickup is missed, ship via Federal Express overnight priority (if shipped on Friday, must check box for Saturday AM delivery) to: Mayo Medical Laboratories, 200 First Street SW, Rochester, MN 55905, Client Services: 800-533-1710

Preferred Volume:
7 mL blood

Minimum Volume:
3 mL blood

Stability (from collection to initiation):
Room temperature, 72 hours.

RESULT INTERPRETATION

Units:
% negative

Reference Interval:
Normal: <= 3% WBC's & RBC's are CD59-negative

Additional Information:
Flow cytometric immunophenotyping is used to study the leukocyte and RBC surface markers of glycosylphosphatidylinositol (GPI) linked antigens such as CD14 (monocytes) and CD59 (neutrophils and RBC). Fluorescent aerolysin (FLAER), a protein that selectively binds to GPI anchors, is also used in the test. Patients with Paroxysmal Nocturnal Hemoglobinuria (PNH) will show abnormality in all or some of these markers to various extents.

ADMINISTRATIVE

CPT Codes:
88180-90 x4

LOINC Codes:
55164-8

COMPLETE VIEW

Available Stat:
No

Test Code:
PNHM

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Flow cytometry

Collect:
Lavender top (EDTA)

Amount to Collect:
7 mL blood

Sample Type:
Whole blood

Preferred Volume:
7 mL blood

Minimum Volume:
3 mL blood

Specimen Preparation:
Do not transfer sample to another container. Transport at Room temperature to China Basin to Send-outs for pick-up at 1600 hours by Medical Courier.

Order Mayo Medical Labs test code # 81156 (CPT). Send at ambient temperature Monday-Thursday, to China Basin Sendouts to meet
MAYO Lab courier (MCI) pickup at 1600 hours.

If pickup is missed, ship via Federal Express overnight priority (if shipped on Friday, must check box for Saturday AM delivery) to: Mayo Medical Laboratories, 200 First Street SW, Rochester, MN 55905, Client Services: 800-533-1710

Units:
% negative

Reference Interval:
Normal: <= 3% WBC's & RBC's are CD59-negative

Synonyms:
- PI-linked antigen
- PNH
- CD55
- CD59
- flow cytometry

Stability (from collection to initiation):
Room temperature, 72 hours.

Reported:
Samples accepted Monday-Friday AM only; test run daily. Turnaround time: 2-5 days.

Additional Information:
Flow cytometric immunophenotyping is used to study the leukocyte and RBC surface markers of glycosylphosphatidylinositol (GPI) linked antigens such as CD14 (monocytes) and CD59 (neutrophils and RBC). Fluorescent aerolysin (FLAER), a protein that selectively binds to GPI anchors, is also used in the test. Patients with Paroxysmal Nocturnal Hemoglobinuria (PNH) will show abnormality in all or some of these markers to various extents

CPT Codes:
- 88180-90 x4

LOINC Codes:
- 55164-8
Parvovirus B19 Antibodies
PB19

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test run Monday-Saturday. Turnaround 2-6 days

Additional Information:
Clinical use is as an aid in the diagnosis of parvovirus infections. Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. Because IgM tests can yield false positive results and low levels of IgM antibody may persist for months post infection, reliance on a single test result could be misleading. If an acute infection is suspected, obtain a new specimen and submit for both IgG and IgM testing in two or more weeks. IgG persists for years and provides life-long immunity. To diagnose current infection, the laboratory recommends Parvovirus, PCR test.

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
2 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Stability (from collection to initiation):
Room temperature: 4 days
Refrigerated: 1 week
Frozen at -20C: 1 month.

PROCESSING

Test Code:
PB19
Test Group:
Parvovirus
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze at -20C. Order Nichols test number 14050N.
Preferred Volume:
2 mL serum
Minimum Volume:
1 mL serum
Stability (from collection to initiation):
Room temperature: 4 days
Refrigerated: 1 week
Frozen at -20°C: 1 month.

**RESULT INTERPRETATION**

**Units:**
- Index

**Reference Interval:**
- Negative: < 0.9 index
- Equivocal: 0.9-1.1 index
- Positive: > 1.1 index

**Additional Information:**
Clinical use is as an aid in the diagnosis of parvovirus infections. Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. Because IgM tests can yield false positive results and low levels of IgM antibody may persist for months post infection, reliance on a single test result could be misleading. If an acute infection is suspected, obtain a new specimen and submit for both IgG and IgM testing in two or more weeks. IgG persists for years and provides life-long immunity. To diagnose current infection, the laboratory recommends Parvovirus, PCR test.

**ADMINISTRATIVE**

**CPT Codes:**
- 86747-90 x 2

**LOINC Codes:**
- 5272-0

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- PB19

**Test Group:**
- Parvovirus

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- EIA

**Collect:**
- Red top

**Amount to Collect:**
- 2 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Specimen Preparation:**
- Freeze at -20°C. Order Nichols test number 14050N.

**Units:**
- Index

**Reference Interval:**
- Negative: < 0.9 index
- Equivocal: 0.9-1.1 index

Printed 06/07/19
Test information subject to change
Positive: > 1.1 index

**Stability (from collection to initiation):**

- Room temperature: 4 days
- Refrigerated: 1 week
- Frozen at -20°C: 1 month.

**Reported:**

- Test run Monday-Saturday. Turnaround 2-6 days

**Additional Information:**

Clinical use is as an aid in the diagnosis of parvovirus infections. Results from any one IgM assay should not be used as a sole determinant of a current or recent infection. Because IgM tests can yield false positive results and low levels of IgM antibody may persist for months post infection, reliance on a single test result could be misleading. If an acute infection is suspected, obtain a new specimen and submit for both IgG and IgM testing in two or more weeks. IgG persists for years and provides life-long immunity. To diagnose current infection, the laboratory recommends Parvovirus, PCR test.

**CPT Codes:**

- 86747-90 x 2

**LOINC Codes:**

- 5272-0

Test information subject to change.
**Parvovirus B19 DNA**

**P338**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Viracor

**Methodology:**
- Quantitative real time PCR

**Reported:**
- 1-3 days after receipt by reference laboratory.

**Additional Information:**
- Performed upon blood to determine whether parvovirus infection is the cause of anemia in patients who have an unexplained marked decrease in erythroid precursor cells in bone marrow or a low peripheral reticulocyte count.

- The test may also be performed upon amniotic fluid to determine whether parvovirus infection in pregnancy is the cause of hydrops fetalis.

- Detects the presence of Parvovirus B19 in cell free plasma by amplifying viral genomic DNA through Real Time PCR technology.

- This assay was developed and the performance characteristics were determined at ViraCor. This test is not FDA approved; however, the test is performed in a CLIA certified laboratory and approval from the FDA is not required.

- Specimens are processed and results reported by Microbiology.

**Synonyms:**
- Parvovirus PCR
- Parvovirus B19 PCR

### COLLECTION

**Sample Type:**
- EDTA plasma, amniotic fluid, bone marrow (acceptable but plasma preferred)

**Collect:**
- Blood or marrow: Lavender top
- Amniotic fluid: Sterile tube

**Amount to Collect:**
- Blood: 3 mL
- Bone Marrow: 1 mL
- Amniotic fluid: 1 mL

**Preferred Volume:**
- Plasma: 1 mL
- Bone marrow: 1 mL
- Amniotic fluid: 1 mL

**Minimum Volume:**
- Plasma: 0.5 mL
- Bone marrow: 0.5 mL
- Amniotic fluid: 0.5 mL

**Stability (from collection to initiation):**
- Room temperature 4 days, plasma or amniotic fluid frozen at -70°C 1 month.

### PROCESSING

**Test Code:**
- P338
Test Group:
- Parvovirus

Sendout:
- Yes

Performing Lab:
- Viracor

Specimen Preparation:
- **Blood:** Centrifuge blood and transfer plasma to a sterile tube. Freeze at -70°C and ship to ViraCor on dry ice.

- **Amniotic fluid:** Freeze at -70°C and ship to ViraCor on dry ice.

- **Bone marrow:** Store and ship to ViraCor at room temperature. Do not centrifuge or freeze. Specimen must be received at ViraCor within 96 hrs of collection.

  ViraCor test code: 1500

Preferred Volume:
- Plasma: 1 mL
- Bone marrow: 1 mL
- Amniotic fluid: 1 mL

Minimum Volume:
- Plasma: 0.5 mL
- Bone marrow: 0.5 mL
- Amniotic fluid: 0.5 mL

Stability (from collection to initiation):
- Room temperature 4 days, plasma or amniotic fluid frozen at -70°C 1 month.

RESULT INTERPRETATION

Units:
- IU/mL

  Note: 1 IU = 0.73 copies/mL

Reference Interval:
- Not detected

Additional Information:
- Performed upon blood to determine whether parvovirus infection is the cause of anemia in patients who have an unexplained marked decrease in erythroid precursor cells in bone marrow or a low peripheral reticulocyte count.

- The test may also be performed upon amniotic fluid to determine whether parvovirus infection in pregnancy is the cause of hydrops fetalis.

- Detects the presence of Parvovirus B19 in cell free plasma by amplifying viral genomic DNA through Real Time PCR technology.

- This assay was developed and the performance characteristics were determined at ViraCor. This test is not FDA approved; however, the test is performed in a CLIA certified laboratory and approval from the FDA is not required.

  Specimens are processed and results reported by Microbiology.

ADMINISTRATIVE

CPT Codes:
- 87799-90

LOINC Codes:
- 49432-8

COMPLETE VIEW

Available Stat:
No
Test Code:
P338
Test Group:
Parvovirus
Performing Lab:
Viracor
Sendout:
Yes
Methodology:
Quantitative real time PCR
Collect:
Blood or marrow: Lavender top
Amniotic fluid: Sterile tube
Amount to Collect:
Blood: 3 mL
Bone Marrow: 1 mL
Amniotic fluid: 1 mL
Sample Type:
EDTA plasma, amniotic fluid, bone marrow (acceptable but plasma preferred)
Preferred Volume:
Plasma: 1 mL
Bone marrow: 1 mL
Amniotic fluid: 1 mL
Minimum Volume:
Plasma: 0.5 mL
Bone marrow: 0.5 mL
Amniotic fluid: 0.5 mL
Specimen Preparation:
Blood: Centrifuge blood and transfer plasma to a sterile tube. Freeze at -70°C and ship to ViraCor on dry ice.
Amniotic fluid: Freeze at -70°C and ship to ViraCor on dry ice.
Bone marrow: Store and ship to ViraCor at room temperature. Do not centrifuge or freeze. Specimen must be received at ViraCor within 96 hrs of collection.
ViraCor test code: 1500
Units:
IU/mL
Note: 1 IU = 0.73 copies/mL
Reference Interval:
Not detected
Synonyms:
• Parvovirus PCR
• Parvovirus B19 PCR
Stability (from collection to initiation):
Room temperature 4 days, plasma or amniotic fluid frozen at -70°C 1 month.
Reported:
1-3 days after receipt by reference laboratory.
Additional Information:
Performed upon blood to determine whether parvovirus infection is the cause of anemia in patients who have an unexplained marked decrease in erythroid precursor cells in bone marrow or a low peripheral reticulocyte count.
The test may also be performed upon amniotic fluid to determine whether parvovirus infection in pregnancy is the cause of hydrops fetalis.
Detects the presence of Parvovirus B19 in cell free plasma by amplifying viral genomic DNA through Real Time PCR technology.
This assay was developed and the performance characteristics were determined at ViraCor. This test is not FDA approved; however, the test is performed in a CLIA certified laboratory and approval from the FDA is not required.

Specimens are processed and results reported by Microbiology.

**CPT Codes:**

87799-90

**LOINC Codes:**

49432-8
PAX5 Break Apart Rearrangement FISH
BPAX5, PAX5

ORDERING

Performing Lab: Cytogenetics
Performed: Mon-Fri 9 am to 5 pm
Methodology: FISH
Reported: 7-14 days
Synonyms:
- BPAX5
- PAX5
- PAX5 9p13.2 BA FISH

COLLECTION

Sample Type: Blood, bone marrow aspirate, bone marrow core
Collect:
- Blood: Dark Green Top Sodium Heparin tube for Blood
- Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Stability (from collection to initiation): 2 days
Storage/Transport Temperature: Room Temperature
Unacceptable Conditions: Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
- Blood: BPAX5
- Bone marrow: PAX5
Performing Lab: Cytogenetics
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
- 2 days

Storage/Transport Temperature:
- Room Temperature

CPT Codes:
- 88271x2, 88275x1

Test Code:
- Blood: BPAX5
- Bone marrow: PAX5

Performing Lab:
- Cytogenetics

Performed:
- Mon-Fri 9 am to 5 pm

Methodology:
- FISH

Collect:
- Blood: Dark Green Top Sodium Heparin tube for Blood
- Bone marrow: Dark Green Top Sodium Heparin tube for Bone Marrow, Sterile container with medium for Bone Core

Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:
- Blood, bone marrow aspirate, bone marrow core

Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Synonyms:
- BPAX5
- PAX5
- PAX5 9p13.2 BA FISH

Storage/Transport Temperature:
- Room Temperature

Stability (from collection to initiation):
- 2 days

Reported:
- 7-14 days
CPT Codes:
88271x2, 88275x1

Test information subject to change
Pediatric CD3 Stem Cell Quantification
PCD3B

ORDERING

Performing Lab: PCTL
Performed: Test performed Monday - Friday at: 0900 & 1400 hours
Methodology: Flow Cytometry
Reported: 3 hours after receipt of sample by 1400 hour. After 1400 hour result will be available next day before 1200 hour.
Additional Information:
This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

This test was performed by the Pediatric Cellular Therapy Laboratory located at 1975 4th Street Room C4C60, San Francisco, CA 94158.
Phone: 415-476-4860 Fax: 415-514-3372
CLID ID Number: 05D2107946 State Lab ID Number: CLF00349021
Laboratory Director: Christopher Dvorak, MD

COLLECTION

Patient Preparation: N / A
Sample Type: MNC APHERESIS
Collect: Lavender Top
Amount to Collect: 1.0 mL
Preferred Volume: 1.0 mL
Minimum Volume: 0.5 mL
Remarks: N / A
Stability (from collection to initiation): 72 hours after collection time

PROCESSING

Test Code: PCD3B
Performing Lab: PCTL
Specimen Preparation:
Notify PCTL (x64860, x44199 or x44193) when a specimen arrives at the Processing Lab. Specimen must be delivered to PCTL before 1400H.
Preferred Volume: 1.0 mL
Minimum Volume:

0.5 mL

Stability (from collection to initiation):

72 hours after collection time

RESULT INTERPRETATION

Units:

% of WBCs

Reference Interval:

>10.0 % of WBCs

Critical Values:

N / A

Additional Information:

This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

This test was performed by the Pediatric Cellular Therapy Laboratory located at 1975 4th Street Room C4C60, San Francisco, CA 94158.
Phone: 415-476-4860 Fax: 415-514-3372

CLID ID Number: 05D2107946 State Lab ID Number: CLF00349021

Laboratory Director: Christopher Dvorak, MD

ADMINISTRATIVE

CPT Codes:

86367

COMPLETE VIEW

Test Code:

PCD3B

Performing Lab:

PCTL

Performed:

Test performed Monday - Friday at: 0900 & 1400 hours

Methodology:

Flow Cytometry

Patient Preparation:

N / A

Remarks:

N / A

Collect:

Lavender Top

Amount to Collect:

1.0 mL

Sample Type:

MNC APHERESIS

Preferred Volume:

1.0 mL

Minimum Volume:

0.5 mL

Specimen Preparation:

Notify PCTL (x64860, x44199 or x44193) when a specimen arrives at the Processing Lab. Specimen must be delivered to PCTL before
1400H.

**Units:**
- % of WBCs

**Reference Interval:**
- >10.0 % of WBCs

**Critical Values:**
- N / A

**Stability (from collection to initiation):**
- 72 hours after collection time

**Reported:**
- 3 hours after receipt of sample by 1400 hour. After 1400 hour result will be available next day before 1200 hour.

**Additional Information:**
- This test was developed and its performance characteristics determined by the UCSF Clinical Laboratories. It has not been cleared or approved by the U.S. Food and Drug Administration.

This test was performed by the Pediatric Cellular Therapy Laboratory located at 1975 4th Street Room C4C60, San Francisco, CA 94158.
Phone: 415-476-4860 Fax: 415-514-3372

CLID ID Number: 05D2107946 State Lab ID Number: CLF00349021

Laboratory Director: Christopher Dvorak, MD

**CPT Codes:**
- 86367
Pediatric CD34 Stem Cell Quantitation
PCD34B

ORDERING

Available Stat: No
Performing Lab: PCTL
Performed: Monday - Friday 0900 & 1400
Methodology: Flow Cytometry
Reported: 3 hours if sample received by 1400. Samples received after 1400 will be resulted the following day weekday.
Additional Information: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

COLLECTION

Sample Type: EDTA Whole blood
Collect: Lavender top
Amount to Collect: 1 mL blood
Preferred Volume: 1 mL blood
Minimum Volume: 0.5 mL blood

PROCESSING

Test Code: PCD34B
Performing Lab: PCTL
Specimen Preparation: Notify PCTL (476-4860, 5414-4199 or 514-4193) when sample arrives at Specimen Processing. Sample must be delivered to PTCL before 1400.
Preferred Volume: 1 mL blood
Minimum Volume: 0.5 mL blood

RESULT INTERPRETATION

Units: % WBC
Reference Interval: <0.02%
Additional Information: This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.
Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

### ADMINISTRATIVE

- **CPT Codes:** 86367
- **LDT or Modified FDA:** Yes

### COMPLETE VIEW

- **Available Stat:** No
- **Test Code:** PCD34B
- **Performing Lab:** PCTL
- **Performed:** Monday - Friday 0900 & 1400
- **Methodology:** Flow Cytometry
- **Collect:** Lavendar top
- **Amount to Collect:** 1 mL blood
- **Sample Type:** EDTA Whole blood
- **Preferred Volume:** 1 mL blood
- **Minimum Volume:** 0.5 mL blood
- **Specimen Preparation:** Notify PCTL (476-4860, 5414-4199 or 514-4193) when sample arrives at Specimen Processing. Sample must be delivered to PTCL before 1400.
- **Units:** % WBC
- **Reference Interval:** <0.02%
- **Reported:** 3 hours if sample received by 1400. Samples received after 1400 will be resulted the following day weekday.
- **Additional Information:** This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

- **CPT Codes:** 86367
- **LDT or Modified FDA:** Yes
Pentobarbital
PENT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Reported:
4-5 days

Additional Information:
For increased intracranial pressure levels with supportive therapy, levels of 20-30 mg/L in children and 25-35 in adults are commonly used.

The lower limit of detection (sensitivity) of the assay is 0.5 mg/L. In addition to its use as a sedative itself, pentobarbital is the major accumulating metabolite of thiopental.

See also Barbiturates and Drug Screening.

COLLECTION

Sample Type:
Serum
Collect:
Red top, Gold top acceptable
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum

PROCESSING

Test Code:
PENT
Sendout:
Yes
Performing Lab:
Quest

Specimen Preparation:
Immediately transfer serum to plastic vial. Order Quest # 39248P
Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:
Therapeutic: 1.0-5.0 mg/L
Potentially toxic: > 10 mg/L
Additional Information:
For increased intracranial pressure levels with supportive therapy, levels of 20-30 mg/L in children and 25-35 in adults are commonly used.

The lower limit of detection (sensitivity) of the assay is 0.5 mg/L. In addition to its use as a sedative itself, pentobarbital is the major accumulating metabolite of thiopental.

See also Barbiturates and Drug Screening.

CPT Codes:
82205-90

LOINC Codes:
3924-8
Peripheral Blood CD34 Enumeration
CD34A

ORDERING

Performing Lab: BMT lab
Performed: Yes
Methodology: Flow Cytometry
Reported: 3 hours
Additional Information: Peripheral CD34 enumeration is used to determine if stem cell collection can be started and to calculate approximate amount of stem cells to be collected on the day of collection.

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 2 mL
Preferred Volume: 2 mL
Minimum Volume: 1.0 mL
Stability (from collection to initiation): Room temperature: 1 Day
Unacceptable Conditions: Clotted specimen

PROCESSING

Test Code: CD34A
Performing Lab: BMT lab
Preferred Volume: 2 mL
Minimum Volume: 1.0 mL
Unacceptable Conditions: Clotted specimen
Stability (from collection to initiation): Room temperature: 1 Day

RESULT INTERPRETATION

Units: Cells/uL
**Additional Information:**
Peripheral CD34 enumeration is used to determine if stem cell collection can be started and to calculate approximate amount of stem cells to be collected on the day of collection.

**ADMINISTRATIVE**

<table>
<thead>
<tr>
<th>CPT Codes:</th>
<th>86367</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDT or Modified FDA:</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**COMPLETE VIEW**

<table>
<thead>
<tr>
<th>Test Code:</th>
<th>CD34A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>BMT lab</td>
</tr>
<tr>
<td>Performed:</td>
<td>Yes</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Flow Cytometry</td>
</tr>
<tr>
<td>Collect:</td>
<td>Lavender top</td>
</tr>
<tr>
<td>Amount to Collect:</td>
<td>2 mL</td>
</tr>
<tr>
<td>Sample Type:</td>
<td>EDTA whole blood</td>
</tr>
<tr>
<td>Preferred Volume:</td>
<td>2 mL</td>
</tr>
<tr>
<td>Minimum Volume:</td>
<td>1.0 mL</td>
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<tr>
<td>Unacceptable Conditions:</td>
<td>Clotted specimen</td>
</tr>
<tr>
<td>Units:</td>
<td>Cells/μL</td>
</tr>
<tr>
<td>Stability (from collection to initiation):</td>
<td>Room temperature: 1 Day</td>
</tr>
<tr>
<td>Reported:</td>
<td>3 hours</td>
</tr>
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</table>

**Additional Information:**
Peripheral CD34 enumeration is used to determine if stem cell collection can be started and to calculate approximate amount of stem cells to be collected on the day of collection.

<table>
<thead>
<tr>
<th>CPT Codes:</th>
<th>86367</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDT or Modified FDA:</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Peripheral Blood Culture
P060

ORDERING

Performing Lab:
Microbiology

Performed:
Daily, all shifts

Methodology:
Culture

Reported:
Up to 6 days

Additional Information:
Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

Reflex Testing:
If bacteria are detected they are identified and susceptibility testing is performed as appropriate.

COLLECTION

Sample Type:
Blood

Collect:
Paired blood culture bottles (BD BACTEC Plus Aerobic & Lytic Anaerobic bottles)

Amount to Collect:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight:
< 1 kg = 1 mL for aerobic only (0.5 ml for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Preferred Volume:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

Minimum Volume:
Adults: 10 mL total (5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Remarks:

1. Adults:
   Collect 2 sets of cultures from different sites.
   Collect at least one set of cultures from a peripheral site.

2. Pediatrics:
   Amount of blood depends on weight of patient (see weight based minimums).

Anaerobic sample should be sent only in the following circumstances: Outpatients, patients with immunodeficiency, malignancy or after bone or human stem cell transplant, patients with gastrointestinal disorder, or at physician's request due to concern for anaerobes. Sending only an aerobic specimen is sufficient for all other patient populations.

3. Cleanse venipuncture site:
   For patients with NO contraindication for use of chlorhexidine products: Cleanse the venipuncture site with ChloraPrep Single Swabstick using a back and forth motion for 30 seconds. Allow it to air dry. NOTE: If skin is soiled, clean with 70% isopropyl alcohol before using ChloraPrep.
For patients with a contraindication for use of Chlorhexidine products, DO NOT USE CHLORAPREP & follow this procedure: Clean skin of venipuncture site with 60-second friction scrub of 70% isopropyl alcohol to a 5 cm circular area. Apply 10% PVP Iodine to venipuncture site skin in a circular motion to a 5 cm area starting in the center. Allow it to air dry. Following the venipuncture, remove residual iodine from patient's skin with 70% isopropyl alcohol.

4. Remove plastic cap of each bottle and scrub top of each bottle with 70% alcohol prep pad.

5. Perform venipuncture and obtain sample.
Nursing staff: Refer to Blood Culture Methods (General) procedure in Nursing Procedures Manual.
Clinical Labs Phlebotomy staff: Refer to Clinical Labs Blood Culture Collection procedure.

6. Instill sample into aerobic bottle first and then into anaerobic bottle. Do not aspirate air into the anaerobic bottle. Do not add more than 10 mL into each bottle. Gently invert bottles to mix contents.

7. Label each bottle with patient's name and medical record number and site of draw. Do not place label on neck of bottle or bottom (underneath) of bottle, and do not cover bar code on bottle with the label. Place label vertically on bottle.

Stability (from collection to initiation):
36 hours at room temperature

Unacceptable Conditions:
Samples that are not collected per "Collection Instructions"

PROCESSING

Test Code:
P060

Test Group:
Bacterial culture

Performing Lab:
Microbiology

Specimen Preparation:
1. If bottles are overfilled, enter OVRFIL (Blood culture appears overfilled; do not put >10ml/bottle.) in SREQ.
2. If actual source (Peripheral Blood, Central Blood) does not match order, complete a credit form and indicate reason BMIS (Specimen source on order/requisition and on bottle received do not match. Test performed and results available under separate order.)
3. Accession the specimen with the test code corresponding to the actual source, and enter MISB (Specimen source on order/requisition and on bottle received do not match. Source listed on bottle used for identification.) in SREQ.
4. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.

Preferred Volume:
Adults: 20 mL total (10 mL for each bottle)

Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

Minimum Volume:
Adults: 10 mL total (5 mL for each bottle)

Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Unacceptable Conditions:
Samples that are not collected per "Collection Instructions"

Stability (from collection to initiation):
36 hours at room temperature

RESULT INTERPRETATION

Reference Interval:
No growth

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned. Additional calls only made if > 7 days have elapsed since first call or a different organism is
Additional Information:

Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

ADMINISTRATIVE

CPT Codes:

87040

COMPLETE VIEW

Test Code:
P060

Test Group:
Bacterial culture

Performing Lab:
Microbiology

Performed:
Daily, all shifts

Methodology:
Culture

Remarks:

1. Adults:
   Collect 2 sets of cultures from different sites.
   Collect at least one set of cultures from a peripheral site.

2. Pediatrics:
   Amount of blood depends on weight of patient (see weight based minimums).
   Anaerobic sample should be sent only in the following circumstances: Outpatients, patients with immunodeficiency, malignancy or after bone or human stem cell transplant, patients with gastrointestinal disorder, or at physician's request due to concern for anaerobes. Sending only an aerobic specimen is sufficient for all other patient populations.

3. Cleanse venipuncture site:
   For patients with NO contraindication for use of chlorhexidine products: Cleanse the venipuncture site with ChloraPrep Single Swabstick using a back and forth motion for 30 seconds. Allow it to air dry. NOTE: If skin is soiled, clean with 70% isopropyl alcohol before using ChloraPrep.

   For patients with a contraindication for use of Chlorhexidine products, DO NOT USE CHLORAPREP & follow this procedure: Clean skin of venipuncture site with 60-second friction scrub of 70% isopropyl alcohol to a 5 cm circular area. Apply 10% PVP Iodine to venipuncture site skin in a circular motion to a 5 cm area starting in the center. Allow it to air dry. Following the venipuncture, remove residual iodine from patient's skin with 70% isopropyl alcohol.

4. Remove plastic cap of each bottle and scrub top of each bottle with 70% alcohol prep pad.

5. Perform venipuncture and obtain sample.
   Nursing staff: Refer to Blood Culture Methods (General) procedure in Nursing Procedures Manual.
   Clinical Labs Phlebotomy staff: Refer to Clinical Labs Blood Culture Collection procedure.

6. Instill sample into aerobic bottle first and then into anaerobic bottle. Do not aspirate air into the anaerobic bottle. Do not add more than 10 mL into each bottle. Gently invert bottles to mix contents.

7. Label each bottle with patient's name and medical record number and site of draw. Do not place label on neck of bottle or bottom (underneath) of bottle, and do not cover bar code on bottle with the label. Place label vertically on bottle.

Collect:
Paired blood culture bottles (BD BACTEC Plus Aerobic & Lytic Anaerobic bottles)

Amount to Collect:

   Adults: 20 mL total (10 mL for each bottle)

   Pediatrics: Collect blood sample amount according to weight:
< 1 kg = 1 mL for aerobic only (0.5 ml for neonates < 72h old)
1 - 5 kg = 2 mL total (1 mL for each bottle)
5 - 15 kg = 3 mL total (1.5 mL for each bottle)
15 - 40 kg = 6 mL total (3 mL for each bottle)
>40 kg = 10 mL total (5 mL for each bottle)

Sample Type:
Blood

Preferred Volume:
Adults: 20 mL total (10 mL for each bottle)
Pediatrics: Collect blood sample amount according to weight (see Amount to Collect above)

Minimum Volume:
Adults: 10 mL total (5 mL for each bottle)
Pediatrics: Draw 1.0 mL minimum for culture (0.5 ml for neonates < 72h old) when collecting aerobic only (standard). If both aerobic and anaerobic needed, instill minimum of 1 mL in each bottle when collecting.

Unacceptable Conditions:
Samples that are not collected per "Collection Instructions"

Specimen Preparation:
1. If bottles are overfilled, enter OVRFIL (Blood culture appears overfilled; do not put >10ml/bottle.) in SREQ.
2. If actual source (Peripheral Blood, Central Blood) does not match order, complete a credit form and indicate reason BMIS (Specimen source on order/requisition and on bottle received do not match. Test performed and results available under separate order.)
3. Accession the specimen with the test code corresponding to the actual source, and enter MISB (Specimen source on order/requisition and on bottle received do not match. Source listed on bottle used for identification.) in SREQ.
4. If the time from collection to loading bottles on the instrument is more than 12 hours, give the bottles to a CLS to subculture before loading.

Reference Interval:
No growth

Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. Gram stain results from the first positive blood culture on a patient will be phoned. Additional calls only made if > 7 days have elapsed since first call or a different organism is identified.

Stability (from collection to initiation):
36 hours at room temperature

Reported:
Up to 6 days

Reflex Testing:
If bacteria are detected they are identified and susceptibility testing is performed as appropriate.

Additional Information:
Notify Microbiology when Brucella is suspect so that the cultures can be incubated for 14 days.

CPT Codes:
87040
Peripheral blood draw for CCGL
PBCGL

ORDERING

Available Stat: 
No
Performing Lab: 
Phlebotomy
Synonyms: 
- Clinical Cancer Genomics Lab blood draw
- Clinical Cancer Genomics Lab draw

COLLECTION

Sample Type: 
EDTA whole blood
Collect: 
Lavender top
Amount to Collect: 
3 mL blood
Preferred Volume: 
3 mL blood

PROCESSING

Test Code: 
PBCGL
Performing Lab: 
Phlebotomy
Specimen Preparation: 
Contact CCGL at 415-502-3252 and inform them that a sample is available for pickup and your location.
Preferred Volume: 
3 mL blood

COMPLETE VIEW

Available Stat: 
No
Test Code: 
PBCGL
Performing Lab: 
Phlebotomy
Collect: 
Lavender top
Amount to Collect: 
3 mL blood
Sample Type: 
EDTA whole blood
Preferred Volume: 
3 mL blood
Specimen Preparation: 
Contact CCGL at 415-502-3252 and inform them that a sample is available for pickup and your location.
Synonyms:

- Clinical Cancer Genomics Lab blood draw
- Clinical Cancer Genomics Lab draw
**pH, Body fluid**

**PHB**

### ORDERING

**Ordering Recommendations:**
Not a routinely available test. See 'Additional information'

**Available Stat:**
No

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Reported:**
Stat 1 hour, Routine 4 hours

**Additional Information:**
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

### COLLECTION

**Sample Type:**
Body Fluid

**Collect:**
Red top, black top or clean container

**Amount to Collect:**
See preferred volume

**Preferred Volume:**
5 mL fluid

**Remarks:**
Deliver promptly to laboratory. Refrigerate if delivery delayed > 60 minutes. specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Stability (from collection to initiation):**
Room temperature 2 hours, refrigerated 1 day. pH may change with storage, test should be run asap.

**Unacceptable Conditions:**
Unrefrigerated sample delivered to laboratory > 2 hours after collection.

### PROCESSING

**Test Code:**
PHB

**Test Group:**
pH

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Specimen Preparation:**
Deliver to chemistry immediately for processing. Do not open container

**Preferred Volume:**
5 mL fluid

**Unacceptable Conditions:**
Unrefrigerated sample delivered to laboratory > 2 hours after collection.
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 1 day. pH may change with storage, test should be run asap.

RESULT INTERPRETATION

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

ADMINISTRATIVE

CPT Codes:
83986

LOINC Codes:
2748-2

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Not a routinely available test. See ‘Additional information’

Test Code:
PHB

Test Group:
pH

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Remarks:
Deliver promptly to laboratory. Refrigerate if delivery delayed > 60 minutes. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top, black top or clean container

Amount to Collect:
See preferred volume

Sample Type:
Body Fluid

Preferred Volume:
5 mL fluid

Unacceptable Conditions:
Unrefrigerated sample delivered to laboratory > 2 hours after collection.

Specimen Preparation:
Deliver to chemistry immediately for processing. Do not open container

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 1 day. pH may change with storage, test should be run asap.

Reported:
Stat 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.
All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:
- 83986

LOINC Codes:
- 2748-2
pH, stool
PHF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Mission Bay Hematology

Performed:
8:00 AM - 4:00 PM daily

Methodology:
pH strip

Reported:
Same or next day.

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Disaccharide malabsorption results in acidification of the stool from the production of short-chain fatty acids by colonic flora if antibiotics do not interfere, typically giving a pH < 5.5.

See also Reducing Substances, stool

Synonyms:
- stool analysis
- disaccharide malabsorption

COLLECTION

Sample Type:
Fresh loose or liquid stool

Collect:
Clean container without preservative

Amount to Collect:
See preferred volume

Preferred Volume:
10 g loose or liquid stool

Minimum Volume:
1/2 teaspoon loose or liquid stool

Remarks:
Collect stool in plastic-lined diapers or non-absorbent material

Stability (from collection to initiation):
Frozen at -20C 48 hours

Unacceptable Conditions:
Fully formed stool. Stools collected in cotton balls, absorbent diaper, swab or kits.

PROCESSING

Test Code:
PHF
Test Group:
  pH
Performing Lab:
  Mission Bay Hematology
Specimen Preparation:
  Deliver immediately to Hematology for testing. If testing is delayed freeze sample at -20C.
Preferred Volume:
  10 g loose or liquid stool
Minimum Volume:
  1/2 teaspoon loose or liquid stool
Unacceptable Conditions:
  Fully formed stool. Stools collected in cotton balls, absorbent diaper, swab or kits.
Stability (from collection to initiation):
  Frozen at -20C 48 hours

RESULT INTERPRETATION

Units:
  pH
Reference Interval:
  >6.5
Additional Information:
  As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

  All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

  Disaccharide malabsorption results in acidification of the stool from the production of short-chain fatty acids by colonic flora if antibiotics do not interfere, typically giving a pH < 5.5.

  See also Reducing Substances, stool

ADMINISTRATIVE

CPT Codes:
  83986

COMPLETE VIEW

Available Stat:
  No
Ordering Recommendations:
  Not a routinely available test. See ‘Additional information’
Test Code:
  PHF
Test Group:
  pH
Performing Lab:
  Mission Bay Hematology
Performed:
  8:00 AM - 4:00 PM daily
Methodology:
  pH strip
Remarks:
Collect stool in plastic-lined diapers or non-absorbent material
Collect:
Clean container without preservative
Amount to Collect:
See preferred volume
Sample Type:
Fresh loose or liquid stool
Preferred Volume:
10 g loose or liquid stool
Minimum Volume:
1/2 teaspoon loose or liquid stool
Unacceptable Conditions:
Fully formed stool. Stools collected in cotton balls, absorbent diaper, swab or kits.
Specimen Preparation:
Deliver immediately to Hematology for testing. If testing is delayed freeze sample at -20C.
Units:
pH
Reference Interval:
>6.5
Synonyms:
• stool analysis
• disaccharide malabsorption
Stability (from collection to initiation):
Frozen at -20C 48 hours
Reported:
Same or next day.
Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Disaccharide malabsorption results in acidification of the stool from the production of short-chain fatty acids by colonic flora if antibiotics do not interfere, typically giving a pH < 5.5.

See also Reducing Substances, stool
CPT Codes:
83986
pH, urine
PHU

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Reported:
4 hours
Additional Information:
Part of routine urinalysis. Order only if greater accuracy than dipstick testing is required.
Specimens should not be unrefrigerated for more than an hour before they are delivered to the laboratory or pH changes may occur due to bacterial growth.

COLLECTION

Sample Type:
Random urine
Collect:
Red top, black top or urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
5 mL urine
Remarks:
Deliver promptly to laboratory. Refrigerate if delivery delayed > 60 min.
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 1 day. Note: pH may change with storage, test should be run asap.
Unacceptable Conditions:
Unrefrigerated samples delivered to lab > 2 hours after collection.

PROCESSING

Test Code:
PHU
Test Group:
pH
Performing Lab:
Parnassus & Mission Bay Chemistry
Specimen Preparation:
Deliver immediately to lab for stat processing. Do not open tube.
Preferred Volume:
5 mL urine
Unacceptable Conditions:
Unrefrigerated samples delivered to lab > 2 hours after collection.
Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 1 day. Note: pH may change with storage, test should be run asap.

RESULT INTERPRETATION
Reference Interval:
4.6-8.0

Additional Information:
- Part of routine urinalysis. Order only if greater accuracy than dipstick testing is required.
- Specimens should not be unrefrigerated for more than an hour before they are delivered to the laboratory or pH changes may occur due to bacterial growth.

ADMINISTRATIVE

CPT Codes:
83986

LOINC Codes:
2756-5

COMPLETE VIEW

Available Stat:
No

Test Code:
PHU

Test Group:
pH

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Remarks:
Deliver promptly to laboratory. Refrigerate if delivery delayed > 60 min.

Collect:
Red top, black top or urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
5 mL urine

Unacceptable Conditions:
Unrefrigerated samples delivered to lab > 2 hours after collection.

Specimen Preparation:
Deliver immediately to lab for stat processing. Do not open tube.

Reference Interval:
4.6-8.0

Stability (from collection to initiation):
Room temperature 2 hours, refrigerated 1 day. Note: pH may change with storage, test should be run asap.

Reported:
4 hours

Additional Information:
- Part of routine urinalysis. Order only if greater accuracy than dipstick testing is required.
- Specimens should not be unrefrigerated for more than an hour before they are delivered to the laboratory or pH changes may occur due to bacterial growth.

CPT Codes:
83986
LOINC Codes:
2756-5
Phencyclidine
PCPU

ORDERING

Performing Lab: Quest
Methodology: Mass Spectrometry
Reported: 5-7 days
Synonyms: • PCP

COLLECTION

Sample Type: Urine
Collect: Urine container
Amount to Collect: 20 mL
Preferred Volume: 20 mL
Minimum Volume: 5 mL
Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: 14 days
Frozen: 30 days
Rejection Criteria: Preserved specimens

PROCESSING

Test Code: PCPU
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze specimen. Transport to CB frozen. Order Quest test code 16921.
Preferred Volume: 20 mL
Minimum Volume: 5 mL
Rejection Criteria: Preserved specimens
Stability (from collection to initiation):
Room temperature: 7 days
Refrigerated: 14 days
Frozen: 30 days
ADMINISTRATIVE

CPT Codes:
  83992-90
LOINC Codes:
  3937-0

COMPLETE VIEW

Test Code:
  PCPU
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Mass Spectrometry
Collect:
  Urine container
Amount to Collect:
  20 mL
Sample Type:
  Urine
Preferred Volume:
  20 mL
Minimum Volume:
  5 mL
Rejection Criteria:
  Preserved specimens
Specimen Preparation:
  Aliquot and freeze specimen. Transport to CB frozen. Order Quest test code 16921.
Synonyms:
  • PCP
Stability (from collection to initiation):
  Room temperature: 7 days
  Refrigerated: 14 days
  Frozen: 30 days
Reported:
  5-7 days
CPT Codes:
  83992-90
LOINC Codes:
  3937-0
### Phenobarbital

**PBAR**

#### ORDERING

**Available Stat:**
- Yes

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Turbidimetric inhibition immunoassay (Beckman DxC800)

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- See also Barbiturates and Drug Screening. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**Synonyms:**
- Luminal

#### COLLECTION

**Sample Type:**
- Serum or plasma

**Collect:**
- Gold top or Light Green top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.2 mL serum or plasma

**Remarks:**
- Time to steady state: 2-4 weeks
- Collect sample before next dose.
- Indicate time of draw on requisition.

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

#### PROCESSING

**Test Code:**
- PBAR

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.2 mL serum or plasma

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units: mg/L

Reference Interval:
Therapeutic levels:

0-17 years: 15-40 mg/L
>= 18 years: 10-40 mg/L

Therapeutic ranges adopted or modified from the literature based on recommendations of UCSF Pharmacists

Critical Values:
>50 mg/L

Additional Information:
See also Barbiturates and Drug Screening. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80184

LOINC Codes:
3948-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
PBAR

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Turbidimetric inhibition immunoassay (Beckman DxC800)

Remarks:
Time to steady state: 2-4 weeks
Collect sample before next dose.
Indicate time of draw on requisition.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Units:
mg/L

Reference Interval:
Therapeutic levels:

0-17 years: 15-40 mg/L
>= 18 years: 10-40 mg/L

Therapeutic ranges adopted or modified from the literature based on recommendations of UCSF Pharmacists

Critical Values:
>50 mg/L

Synonyms:
- Luminal

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
- See also Barbiturates and Drug Screening. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
- 80184

LOINC Codes:
- 3948-7
**Phenylalanine**

**PALA**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- IEC

**Reported:**
- Set up 5x per week
- Turnaround time: 2-4 days

**Additional Information:**
- To convert result to mg/dL, multiply result in µmol/L x 0.0165

### COLLECTION

**Patient Preparation:**
- Fasting for 4 hours prior to sample collection is recommended.

**Sample Type:**
- Heparinized plasma

**Collect:**
- Dark Green top

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Stability (from collection to initiation):**
- Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month

### PROCESSING

**Test Code:**
- PALA

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Freeze plasma at -20C. Order Quest # 37356

**Preferred Volume:**
- 2 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Stability (from collection to initiation):**
- Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month

### RESULT INTERPRETATION

**Units:**

*Printed 06/07/19*

*Test information subject to change*
µmol/L

Reference Interval:

<= 30 days  30-79 µmol/L
31 days-23 months 31-92 µmol/L
2-18 years  38-86 µmol/L
>18 years  40-74 µmol/L

Additional Information:
To convert result to mg/dL, multiply result in µmol/L x 0.0165

ADMINISTRATIVE

CPT Codes:
84030-90

LOINC Codes:
14875-9

COMPLETE VIEW

Available Stat:
No

Test Code:
PALA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
IEC

Patient Preparation:
Fasting for 4 hours prior to sample collection is recommended.

Collect:
Dark Green top

Amount to Collect:
4 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
2 mL plasma

Minimum Volume:
0.5 mL plasma

Specimen Preparation:
Freeze plasma at -20C. Order Quest # 37356

Units:
µmol/L

Reference Interval:

<= 30 days  30-79 µmol/L
31 days-23 months 31-92 µmol/L
2-18 years  38-86 µmol/L
>18 years  40-74 µmol/L

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 1 week, frozen at -20C 1 month

Reported:
Set up 5x per week Turnaround time: 2-4 days

Additional Information:
To convert result to mg/dL, multiply result in µmol/L x 0.0165
CPT Codes:
   84030-90
LOINC Codes:
   14875-9
Phenytoin, Free
PHNYF

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Ultrafiltration-High Pressure Liquid Chromatography
Reported:
Run 5x per week. Turnaround 3-5 days
Additional Information:
Phenytoin binds to albumin, only the free fraction is therapeutically active. In patients with hypoalbuminemia, who are on dialysis, are critically ill or are receiving medications that may displace phenytoin the measurement of total phenytoin levels may result in either under or overdosing. In these situations assessing free phenytoin is suggested.

Synonyms:
• Dilantin
• Fosphenytoin
• Cerebyx

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
5 mL blood
Preferred Volume:
2.5 mL serum
Minimum Volume:
1.5 mL serum
Remarks:
Time to steady state: 3-4 days
Collect samples 30 minutes before AM dose.
Draw at least 4 hours post-IV dose and 6-9 hours post-PO dose
Collect in Red top tube only. Avoid hemolysis.
Order total phenytoin separately if desired. Indicate time of collection on requisiition.

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month

Unacceptable Conditions:
Collected in Gold top. Gross hemolysis

PROCESSING

Test Code:
PHNYF
Test Group:
Phenytoin
Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Refrigerate separated serum. Be sure that total Phenytoin has been separately ordered, if requested. Order Quest # 39693P

For B&T patients order labCorp test #070706 "Phenytoin Free & Total only"

Preferred Volume:
2.5 mL serum

Minimum Volume:
1.5 mL serum

Unacceptable Conditions:
Collected in Gold top. Gross hemolysis

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:
Therapeutic: 1.0-2.0 µg/mL
Potentially toxic: > 3.0 µg/mL

Additional Information:
Phenytoin binds to albumin, only the free fraction is therapeutically active. In patients with hypoalbuminemia, who are on dialysis, are critically ill or are receiving medications that may displace phenytoin the measurement of total phenytoin levels may result in either under or overdosing. In these situations assessing free phenytoin is suggested.

ADMINISTRATIVE

CPT Codes:
80186-90

LOINC Codes:
3969-3

COMPLETE VIEW

Available Stat:
No

Test Code:
PHNYF

Test Group:
Phenytoin

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Ultrafiltration-High Pressure Liquid Chromatography

Remarks:
Time to steady state: 3-4 days
Collect samples 30 minutes before AM dose.
Draw at least 4 hours post-IV dose and 6-9 hours post-PO dose
Collect in Red top tube only. Avoid hemolysis.

Order total phenytoin separately if desired. Indicate time of collection on requisition.

**Collect:**
- Red top (Gold top **NOT** acceptable)

**Amount to Collect:**
- 5 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2.5 mL serum

**Minimum Volume:**
- 1.5 mL serum

**Unacceptable Conditions:**
- Collected in Gold top. Gross hemolysis

**Specimen Preparation:**
- Refrigerate separated serum. Be sure that total Phenytoin has been separately ordered, if requested. Order Quest # 39693P

For B&T patients order labCorp test #070706 "Phenytoin Free & Total only"

**Units:**
- µg/mL (mcg/mL)

**Reference Interval:**
- Therapeutic: 1.0-2.0 µg/mL
- Potentially toxic: > 3.0 µg/mL

**Synonyms:**
- Dilantin
- Fosphenytoin
- Cerebyx

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen at -20C 1 month

**Reported:**
- Run 5x per week. Turnaround 3-5 days

**Additional Information:**
- Phenytoin binds to albumin, only the free fraction is therapeutically active. In patients with hypoalbuminemia, who are on dialysis, are critically ill or are receiving medications that may displace phenytoin the measurement of total phenytoin levels may result in either under or overdosing. In these situations assessing free phenytoin is suggested.

**CPT Codes:**
- 80186-90

**LOINC Codes:**
- 3969-3
Phenytoin, total
PHNY

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Turbidimetric inhibition immunoassay (Beckman DxC800)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
The level of phenytoin can be empirically corrected for the effect of hypoalbuminemia with the formula:

Corrected = Measured/(0.9(actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.2 x actual albumin) + 0.1).

If renal failure coexists with hypoalbuminemia, the formula is:

Corrected = Measured/(0.9)((0.48 x actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.1 x actual albumin) + 0.1)

Synonyms:
• Dilantin
• Fosphenytoin
• Cerebyx

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Remarks:
Time to steady state: 3-4 days

Collect samples 30 minutes before AM dose.

Draw at least 4 hours post-IV dose and 6-9 hours post-PO dose

Indicate time of draw on requisition.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Unacceptable Conditions:
Specimen received in gold top or lithium heparin tube with gel

PROCESSING

Test Code:
PHNY
Test Group:
Phenytoin
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Unacceptable Conditions:
Specimen received in gold top or lithium heparin tube with gel
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
mg/L
Reference Interval:
Therapeutic: 10-20 mg/L

Source: Phenytoin: Drug information, Copyright 1978-2012 Lexicomp, Inc. Accessed in UpToDate, August 2012

Therapeutic ranges adopted or modified from the literature based on recommendations of UCSF Pharmacists

Critical Values:
>30 mg/L

Additional Information:
The level of phenytoin can be empirically corrected for the effect of hypoalbuminemia with the formula:

Corrected = Measured/(0.9(actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.2 x actual albumin) + 0.1)

If renal failure coexists with hypoalbuminemia, the formula is:

Corrected = Measured/(0.9)((0.48 x actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.1 x actual albumin) + 0.1)

ADMINISTRATIVE

CPT Codes:
80185
LOINC Codes:
3968-5
Available Stat: Yes
Test Code: PHNY
Test Group: Phenytoin
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Turbidimetric inhibition immunoassay (Beckman DxC800)
Remarks:
- Time to steady state: 3-4 days
- Collect samples 30 minutes before AM dose.
- Draw at least 4 hours post-IV dose and 6-9 hours post-PO dose
- Indicate time of draw on requisition.
Collect:
- Red top
Amount to Collect:
- 1 mL blood
Sample Type:
- Serum
Preferred Volume:
- 0.5 mL serum
Minimum Volume:
- 0.2 mL serum
Unacceptable Conditions:
- Specimen received in gold top or lithium heparin tube with gel
Units:
- mg/L
Reference Interval:
- Therapeutic: 10-20 mg/L
  - Source: Phenytoin: Drug information, Copyright 1978-2012 Lexicomp, Inc. Accessed in UpToDate, August 2012
- Therapeutic ranges adopted or modified from the literature based on recommendations of UCSF Pharmacists
Critical Values:
- >30 mg/L
Synonyms:
- Dilantin
- Fosphenytoin
- Cerebyx
Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
Reported:
- STAT 1 hour, Routine 4 hours
Additional Information:
- The level of phenytoin can be empirically corrected for the effect of hypoalbuminemia with the formula:
Corrected = Measured/(0.9(actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.2 x actual albumin) + 0.1).

If renal failure coexists with hypoalbuminemia, the formula is:

Corrected = Measured/(0.9)((0.48 x actual albumin/4.4) + 0.1)

OR

Corrected = Measured/(0.1 x actual albumin) + 0.1)

CPT Codes:

  80185

LOINC Codes:

  3968-5
Phospholipase A2 Receptor (PLA2R) Antibody, IgG with Reflex to Titer
PLA2R

ORDERING

Ordering Recommendations:
Aids in the differential diagnosis of membranous glomerulonephritis (MGN) or nephrotic syndrome of unknown etiology.

Performing Lab:
ARUP

Performed:
Wed

Methodology:
Semi-Quantitative Indirect Fluorescent Antibody

Reported:
1-8 days

COLLECTION

Sample Type:
Serum (Red top tube)

Collect:
Serum Separator Tube

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
Refrigerated

Unacceptable Conditions:
Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated

PROCESSING

Test Code:
PLA2R

ARUP Test Code:
2011828

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.2 mL)

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated
Stability (from collection to initiation):
  Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

Storage/Transport Temperature:
  Refrigerated

RESULT INTERPRETATION

Reference Interval:
  Less than 1:10

Interpretive Data:
  A positive result (1:10 or greater) for phospholipase A2 receptor antibody, IgG, in conjunction with other laboratory and clinical findings, supports a diagnosis of primary membranous glomerulonephritis (pMGN).

ADMINISTRATIVE

CPT Codes:
  86255; if reflexed, add 86256

LOINC:
  ● 82991-1

COMPLETE VIEW

Ordering Recommendations:
  Aids in the differential diagnosis of membranous glomerulonephritis (MGN) or nephrotic syndrome of unknown etiology.

Test Code:
  PLA2R

ARUP Test Code:
  2011828

Performing Lab:
  ARUP

Sendout:
  Yes

Performed:
  Wed

Methodology:
  Semi-Quantitative Indirect Fluorescent Antibody

Collect:
  Serum Separator Tube

Amount to Collect:
  2 mL blood

Sample Type:
  Serum (Red top tube)

Preferred Volume:
  1 mL serum

Minimum Volume:
  0.2 mL serum

Unacceptable Conditions:
  Hemolyzed, hyperlipemic, icteric, heat-treated or contaminated

Specimen Preparation:
  Separate serum from cells ASAP or within 2 hours of collection. Transfer 1 mL serum to an ARUP Standard Transport Tube. (Min: 0.2 mL)

Reference Interval:
  Less than 1:10

Interpretive Data:
A positive result (1:10 or greater) for phospholipase A2 receptor antibody, IgG, in conjunction with other laboratory and clinical findings, supports a diagnosis of primary membranous glomerulonephritis (pMGN).

**Storage/Transport Temperature:**
- Refrigerated

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: 2 weeks; Frozen: 1 year

**Reported:**
- 1-8 days

**CPT Codes:**
- 86255; if reflexed, add 86256

**LOINC:**
- 82991-1

**Notes:**
- If Phospholipase A2 Receptor Antibody, IgG is positive, then a Phospholipase Receptor A2 Antibody, IgG titer is reported. Additional charges apply.

Test information subject to change
Phospholipids
PLIP

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Spectrophotometric
Reported: Test performed Sunday and Thursday AM and reports on Monday and Friday PM.
Additional Information: Test is for research use only.

COLLECTION

Patient Preparation: An 8 hour fast before specimen collection is preferred.
Sample Type: Serum (plasma is not acceptable)
Collect: Red top (Gold top NOT acceptable)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.3 mL serum or plasma

PROCESSING

Test Code: PLIP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate. Order Quest # 717X
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.3 mL serum or plasma

RESULT INTERPRETATION

Units:
**Reference Interval:**
151-264 mg/dL

**Additional Information:**
Test is for research use only.

**ADMINISTRATIVE**

**CPT Codes:**
84311-90

**LOINC Codes:**
2568-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
PLIP

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Spectrophotometric

**Patient Preparation:**
An 8 hour fast before specimen collection is preferred.

**Collect:**
Red top (Gold top NOT acceptable)

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum (plasma is not acceptable)

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.3 mL serum or plasma

**Unacceptable Conditions:**
Collected in Gold top. Plasma sample.

**Specimen Preparation:**
Refrigerate. Order Quest # 717X

**Units:**
mg/dL

**Reference Interval:**
151-264 mg/dL

**Reported:**
Test performed Sunday and Thursday AM and reports on Monday and Friday PM.

**Additional Information:**
Test is for research use only.

**CPT Codes:**
84311-90

**LOINC Codes:**
2568-4

Printed 06/07/19
Test information subject to change
Phosphorus, 24 hour (or timed) urine
PO4U

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Spectrophotometric (molybdate)
Reported: 4-18 hours
Additional Information: To convert mg/dL to mmol/L (SI units) multiply by 0.323.
Output varies with diet.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.
Synonyms: PO4

COLLECTION

Sample Type: Timed urine collection
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output for collection period
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Remarks: Refrigerate container during collection period.
Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.
Stability (from collection to initiation): Refrigerated 2 days
Unacceptable Conditions: Container not refrigerated during collection.

PROCESSING

Test Code: PO4U
Test Group: Phosphorus
Performing Lab:
  Parnassus & Mission Bay Chemistry

Specimen Preparation:
  Aliquot 1 mL and add 1 drop of 6N HCl to acidify.

Preferred Volume:
  1 mL urine

Minimum Volume:
  0.5 mL urine

Unacceptable Conditions:
  Container not refrigerated during collection.

Stability (from collection to initiation):
  Refrigerated 2 days

RESULT INTERPRETATION

Units:
  mg/D

Reference Interval:
  400-1300 mg/D

Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.323.

Output varies with diet.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
  84105

COMPLETE VIEW

Available Stat:
  No

Test Code:
  PO4U

Test Group:
  Phosphorus

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
  Spectrophotometric (molybdate)

Remarks:
  Refrigerate container during collection period.

  Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

  Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
  24 hour urine collection container

Amount to Collect:
Entire urine output for collection period

**Sample Type:**
- Timed urine collection

**Preferred Volume:**
- 1 mL urine

**Minimum Volume:**
- 0.5 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection.

**Specimen Preparation:**
- Aliquot 1 mL and add 1 drop of 6N HCl to acidify.

**Units:**
- mg/D

**Reference Interval:**
- 400-1300 mg/D

**Synonyms:**
- PO4

**Stability (from collection to initiation):**
- Refrigerated 2 days

**Reported:**
- 4-18 hours

**Additional Information:**
- To convert mg/dL to mmol/L (SI units) multiply by 0.323.

- Output varies with diet.

- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

**CPT Codes:**
- 84105

Test information subject to change
Phosphorus, Plasma / Serum

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (molybdate)
Reported:
STAT 1 hour, Routine: 4 hour
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.323.
Phosphorus, like potassium, is released by platelets during clotting, and serum levels are approx. 0.2 mg/dL higher than those measured in plasma. Levels can be falsely elevated by thrombocytosis, though not as predictably as those for potassium.
High dose liposomal amphotericin B treatment may also cause falsely elevated serum phosphorus values in this DXC assay (see Bailey H and Chan E, Clin Chem 53:795-6, 2007)
Synonyms:
• PO4

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
PO4
Test Group:
Phosphorus
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 month</td>
<td>3.7 - 7.7 mg/dL</td>
</tr>
<tr>
<td>1 month - 11 months</td>
<td>3.3 - 6.6 mg/dL</td>
</tr>
<tr>
<td>1 year - 3 years</td>
<td>2.9 - 6.0 mg/dL</td>
</tr>
<tr>
<td>4 years - 12 years</td>
<td>2.8 - 5.7 mg/dL</td>
</tr>
<tr>
<td>13 years - 15 years</td>
<td>2.7 - 5.1 mg/dL</td>
</tr>
<tr>
<td>&gt;= 16 years</td>
<td>2.4 - 4.9 mg/dL</td>
</tr>
</tbody>
</table>

2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF with the lower limits of normal adjusted to encompass results from plasma specimens.

Critical Values:

<1.0 mg/dL

Additional Information:

To convert mg/dL to mmol/L (SI units) multiply by 0.323.

Phosphorus, like potassium, is released by platelets during clotting, and serum levels are approx. 0.2 mg/dL higher than those measured in plasma. Levels can be falsely elevated by thrombocytosis, though not as predictably as those for potassium.

High dose liposomal amphotericin B treatment may also cause falsely elevated serum phosphorus values in this DXC assay (see Bailey H and Chan E, Clin Chem 53:795-6, 2007)

ADMINISTRATIVE

CPT Codes:

84100

LOINC Codes:

2777-1

COMPLETE VIEW

Available Stat:
Yes

Test Code:
PO4

Test Group:
Phosphorus

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (molybdate)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mg/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Reference Interval (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 month</td>
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</tr>
<tr>
<td>1 month - 11 months</td>
<td>3.3 - 6.6 mg/dL</td>
</tr>
<tr>
<td>1 year - 3 years</td>
<td>2.9 - 6.0 mg/dL</td>
</tr>
<tr>
<td>4 years - 12 years</td>
<td>2.8 - 5.7 mg/dL</td>
</tr>
<tr>
<td>13 years - 15 years</td>
<td>2.7 - 5.1 mg/dL</td>
</tr>
<tr>
<td>&gt;= 16 years</td>
<td>2.4 - 4.9 mg/dL</td>
</tr>
</tbody>
</table>

2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF with the lower limits of normal adjusted to encompass results from plasma specimens.

Critical Values:
<1.0 mg/dL

Synonyms:
• PO4

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:
STAT 1 hour, Routine: 4 hour

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.323.

Phosphorus, like potassium, is released by platelets during clotting, and serum levels are approx. 0.2 mg/dL higher than those measured in plasma. Levels can be falsely elevated by thrombocytosis, though not as predictably as those for potassium.

High dose liposomal amphotericin B treatment may also cause falsely elevated serum phosphorus values in this DXC assay (see Bailey H and Chan E, Clin Chem 53:795-6, 2007)

CPT Codes:
84100

LOINC Codes:
2777-1
Phosphorus, random urine
PO4UR

ORDERING

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (molybdate)

Reported:
4-18 hours

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.323.

Output varies with diet.

Synonyms:
• PO4

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
20 mL urine

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
PO4UR

Test Group:
Phosphorus

Performing Lab:
Parnassus & Mission Bay Chemistry

Specimen Preparation:
Aliquot 1 mL and add 1 drop of 6N HCl to acidify.

Preferred Volume:
1 mL urine

Minimum Volume:
0.5 mL urine

Stability (from collection to initiation):
Refrigerated 2 days
RESULT INTERPRETATION

Units:
  mg/dL
Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.323.
  Output varies with diet.

ADMINISTRATIVE

CPT Codes:
  84105
LOINC Codes:
  2778-9

COMPLETE VIEW

Available Stat:
  No
Test Code:
  PO4UR
Test Group:
  Phosphorus
Performing Lab:
  Parnassus & Mission Bay Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Spectrophotometric (molybdate)
Collect:
  Urine cup
Amount to Collect:
  20 mL urine
Sample Type:
  Random urine
Preferred Volume:
  1 mL urine
Minimum Volume:
  0.5 mL urine
Specimen Preparation:
  Aliquot 1 mL and add 1 drop of 6N HCl to acidify.
Units:
  mg/dL
Synonyms:
  • PO4
Stability (from collection to initiation):
  Refrigerated 2 days
Reported:
  4-18 hours
Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.323.
  Output varies with diet.
CPT Codes:
84105
LOINC Codes:
2778-9
Pinworm Examination
P405

ORDERING

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Monday-Friday, day shift

Methodology:
Microscopy

Reported:
1-3 days

COLLECTION

Patient Preparation:
Samples should be collected before the patient bathes or defecates in the morning.

Sample Type:
SWUBE® paddle

Collect:
see notes

Preferred Volume:
3 SWUBE® paddles

Remarks:
Special collection paddles (SWUBE) are available from outpatient phlebotomy stations or Microbiology; if the paddles are unavailable, transparent, clear Scotch tape, (NOT "Magic Transparent" tape), can be used, applying it sticky-side down to a clean glass microscope slide.

CAUTION: Pinworm eggs are very infectious. Wear gloves when collecting sample and wash hands immediately after collection.

SWUBE paddle procedure:

1. Pinworm collection kits are sealed in a plastic bag. Each kit consists of 3 SWUBE® paddles, 3 blank labels, and an instruction sheet for proper collection of the sample. The SWUBE® paddles are individually wrapped. Do not use if the package is not intact.

2. Specimens should be collected on three consecutive days to rule out infection.

3. The specimen is best obtained a few hours after the patient has retired, between the hours of 9:00 p.m. and midnight, or in the morning, immediately upon rising and before bathing or bowel movement.

4. Unwrap the SWUBE® paddle from its package prior to use. Hold the paddle by the cap and remove it from the tube. Set aside the tube.

5. To collect the specimen use the "sticky side" of the paddle, which is labeled on the far end of the paddle near the cap. If you are not sure which side is the "sticky side," feel the end of the paddle with the finger tip to feel the stickiness.

6. In obtaining the sample, spread the buttocks and press the tacky surface of the paddle firmly against several areas (the right and left) of the peri-anal region. Do not press into the anus.

7. Return the paddle in the original tube for transport to the laboratory.

8. Identify the tube by writing the patient's name, medical record number, and the collection date on the blank label provided.

9. Place the tube in a sealed plastic bag and store at room temperature.

Stability (from collection to initiation):
Room temperature 1 week

**Unacceptable Conditions:**
- Improperly collected sample

---

**PROCESSING**

**Test Code:**
- P405

**Performing Lab:**
- Microbiology

**Preferred Volume:**
- 3 SWUBE® paddles

**Unacceptable Conditions:**
- Improperly collected sample

**Stability (from collection to initiation):**
- Room temperature 1 week

---

**RESULT INTERPRETATION**

**Reference Interval:**
- Negative

---

**ADMINISTRATIVE**

**CPT Codes:**
- 87172

**LOINC Codes:**
- 675-9

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- P405

**Performing Lab:**
- Microbiology

**Performed:**
- Monday-Friday, day shift

**Methodology:**
- Microscopy

**Patient Preparation:**
- Samples should be collected before the patient bathes or defecates in the morning.

**Remarks:**

Special collection paddles (SWUBE) are available from outpatient phlebotomy stations or Microbiology; if the paddles are unavailable, transparent, clear Scotch tape, (NOT "Magic Transparent" tape), can be used, applying it sticky-side down to a clean glass microscope slide.

CAUTION: Pinworm eggs are very infectious. Wear gloves when collecting sample and wash hands immediately after collection.

**SWUBE paddle procedure:**

1. Pinworm collection kits are sealed in a plastic bag. Each kit consists of 3 SWUBE® paddles, 3 blank labels, and an instruction sheet for proper collection of the sample. The SWUBE® paddles are individually wrapped. Do not use if the package is not intact.

2. Specimens should be collected on three consecutive days to rule out infection.
3. The specimen is best obtained a few hours after the patient has retired, between the hours of 9:00 p.m. and midnight, or in the morning, immediately upon rising and before bathing or bowel movement.

4. Unwrap the SWUBE® paddle from its package prior to use. Hold the paddle by the cap and remove it from the tube. Set aside the tube.

5. To collect the specimen use the "sticky side" of the paddle, which is labeled on the far end of the paddle near the cap. If you are not sure which side is the "sticky side," feel the end of the paddle with the finger tip to feel the stickiness.

6. In obtaining the sample, spread the buttocks and press the tacky surface of the paddle firmly against several areas (the right and left) of the peri-anal region. Do not press into the anus.

7. Return the paddle in the original tube for transport to the laboratory.

8. Identify the tube by writing the patient's name, medical record number, and the collection date on the blank label provided.

9. Place the tube in a sealed plastic bag and store at room temperature.

Collect:
see notes

Sample Type:
SWUBE® paddle

Preferred Volume:
3 SWUBE® paddles

Unacceptable Conditions:
Improperly collected sample

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature 1 week

Reported:
1-3 days

CPT Codes:
87172

LOINC Codes:
675-9
Pipecolic Acid
MOLT

ORDERING

Available Stat:  No
Performing Lab:  KNDY
Reported:  2-3 weeks
Synonyms:  • Peroxisomal disease

COLLECTION

Sample Type:  EDTA plasma, Random urine
Collect:  Lavender top, urine cup
Amount to Collect:  6 mL blood
Preferred Volume:  Plasma: 3 mL
                  Urine: 10 mL
Minimum Volume:  Plasma: 1 mL
                  Urine: 10 mL

PROCESSING

Test Code:  MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:  Yes
Performing Lab:  KNDY
Specimen Preparation:  Freeze at -20C until sent at room temperature by Federal Express for next day delivery.
                      Ship to: Peroxisomal Diseases Laboratory, Kennedy Krieger Institute, 707 N. Broadway, rm 421, Baltimore, MD 21205, (888)554-2080, fax (410)502-8279 mosera@kennedykrieger.org www.genetics.kennedykrieger.org
Preferred Volume:  Plasma: 3 mL
                  Urine: 10 mL
Minimum Volume:  Plasma: 1 mL
                 Urine: 10 mL

RESULT INTERPRETATION

Reference Interval:  Negative
Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Performing Lab: KNDY
Sendout: Yes
Collect: Lavender top, urine cup
Amount to Collect: 6 mL blood
Sample Type: EDTA plasma, Random urine
Preferred Volume:
  Plasma: 3 mL
  Urine: 10 mL
Minimum Volume:
  Plasma: 1 mL
  Urine: 10 mL
Specimen Preparation:
  Freeze at -20C until sent at room temperature by Federal Express for next day delivery.
Ship to: Peroxisomal Diseases Laboratory, Kennedy Krieger Institute, 707 N. Broadway, rm 421, Baltimore, MD 21205, (888)554-2080, fax (410)502-8279 mosera@kennedykrieger.org www.genetics.kennedykrieger.org
Reference Interval:
  Negative
Synonyms:
  • Peroxisomal disease
Reported:
  2-3 weeks
Plasma Renin Activity

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Reported:
Test run Tuesday-Saturday. Turnaround time: 1-3 days.
Additional Information:
Refrigeration causes cryoactivation of prorenin to renin causing falsely high renin activity results.

COLLECTION

Patient Preparation:
Discontinue diuretics, estrogens and oral contraceptives for at least 2 weeks and non-diuretic antihypertensive Rx several days before study. Dietary sodium content should be maintained for at least 3 days prior to testing.
Sample Type:
EDTA Plasma
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
Collect blood preferably midmorning, after the patient has been up (sitting, standing, or walking) for at least 2 hours and then seated quietly for 5-15 minutes before blood draw.

Collect in lavender tube and transport to the laboratory at room temp for prompt separation and freezing of plasma. DO NOT place on ice or refrigerate sample.
Stability (from collection to initiation):
Room temperature 24 hours, frozen at -20C 28 days.
Rejection Criteria:
Specimen received thawed, refrigerated samples.

PROCESSING

Test Code:
REN
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
After collection, sample can be stored up to 24 hours at room temperature. DO NOT REFRIGERATE THE SAMPLE. Centrifuge and freeze the plasma in plastic at -20C as soon as possible after receipt.
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma

Rejection Criteria:
Specimen received thawed, refrigerated samples.

Stability (from collection to initiation):
Room temperature 24 hours, frozen at -20°C 28 days.

RESULT INTERPRETATION

Units:
ng/mL/hour

Reference Interval:
0.25-5.82 ng/mL/hour

Pediatric ranges have not been established for this assay. Please see 'Additional Information'

Additional Information:
Refrigeration causes cryoactivation of prorenin to renin causing falsely high renin activity results.

ADMINISTRATIVE

CPT Codes:
84244-90

LOINC Codes:
2915-7

COMPLETE VIEW

Available Stat:
No

Test Code:
REN

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Patient Preparation:
Discontinue diuretics, estrogens and oral contraceptives for at least 2 weeks and non-diuretic antihypertensive Rx several days before study. Dietary sodium content should be maintained for at least 3 days prior to testing.

Remarks:
Collect blood preferably midmorning, after the patient has been up (sitting, standing, or walking) for at least 2 hours and then seated quietly for 5-15 minutes before blood draw.

Collect in lavender tube and transport to the laboratory at room temp for prompt separation and freezing of plasma. DO NOT place on ice or refrigerate sample.

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma
Rejection Criteria:
Specimen received thawed, refrigerated samples.

Specimen Preparation:
After collection, sample can be stored up to 24 hours at room temperature. DO NOT REFRIGERATE THE SAMPLE. Centrifuge and freeze the plasma in plastic at -20°C as soon as possible after receipt.

Units:
ng/mL/hour

Reference Interval:
0.25-5.82 ng/mL/hour

Pediatric ranges have not been established for this assay. Please see ‘Additional Information’

Stability (from collection to initiation):
Room temperature 24 hours, frozen at -20°C 28 days.

Reported:
Test run Tuesday-Saturday. Turnaround time: 1-3 days.

Additional Information:
Refrigeration causes cryoactivation of prorenin to renin causing falsely high renin activity results.

CPT Codes:
84244-90

LOINC Codes:
2915-7
Plasminogen Activator Inhibitor - 1 antigen
PAI1AG

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Enzyme immunoassay

**Reported:**
Set up Wednesday and Friday; Report available: 3 days

**Additional Information:**
Deep vein thrombosis and coronary artery disease have been variably associated with increased PAI-1 levels. Elevated PAI-1 levels may help predict risk of reinfarction in survivors of myocardial infarction, particularly in young individuals.

Deficiency of PAI-1, a rare condition that is difficult to diagnose, has been associated with a bleeding diathesis.

As an acute phase reactant, the activity is increased after an acute event. Elevated levels may also be seen in diabetes and pregnancy.

Studies suggest PAI-1 may be a prognostic marker in early stage breast cancer.

**Synonyms:**
- PAI-1 antigen

**COLLECTION**

**Sample Type:**
Citrated Plasma

**Collect:**
Blue top filled to full extent of vacuum

**Amount to Collect:**
2.7 mL blood

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

The venipuncture must be clean, with no trauma. The first 5 mL of blood drawn from a patient should not be used for coagulation testing. If drawn through an indwelling catheter, flush with 5 mL of saline and discard the first 5 mL of blood collected before collecting the specimen for coagulation testing.

Blood should not be collected from heparinized lines.

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 3 days, frozen at -20C 6 months.

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**Rejection Criteria:**
Sample received thawed.
PROCESSING

Test Code: PAI1AG
Test Group: Plasminogen
Sendout: Yes
Performing Lab: Quest

Specimen Preparation:
Forward blue top to Hematology for processing. Aliquot separated plasma into 1 mL sample and freeze in plastic tubes at -20C. Platelet contamination of a test sample will tend to falsely elevate results. Ship on dry ice to China Basin sendout M-F for processing to Quest or LabCorp Ref. Labs. Order Quest test # 59766P, if B/T patient order BTMOLT, order LabCorp test # 500057.

Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Rejection Criteria:
Sample received thawed.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 3 days, frozen at -20C 6 months.

RESULT INTERPRETATION

Units: ng/mL
Reference Interval: 4-43 ng/mL

Additional Information:
Deep vein thrombosis and coronary artery disease have been variably associated with increased PAI-1 levels. Elevated PAI-1 levels my help predict risk of reinfarction in survivors of myocardial infarction, particularly in young individuals.

Deficiency of PAI-1, a rare condition that is difficult to diagnose, has been associated with a bleeding diathesis.

As an acute phase reactant, the activity is increased after an acute event. Elevated levels may also be seen in diabetes and pregnancy.

Studies suggest PAI-1 may be prognostic marker in early stage breast cancer.

ADMINISTRATIVE

CPT Codes: 85414-90
LOINC Codes: 22758-7

COMPLETE VIEW

Available Stat: No
Test Code: PAI1AG
Test Group: Plasminogen
Performing Lab:
    Quest
Sendout:
    Yes
Methodology:
    Enzyme immunoassay
Remarks:
    1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
    2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
    3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
    4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

The venipuncture must be clean, with no trauma. The first 5 mL of blood drawn from a patient should not be used for coagulation testing. If drawn through an indwelling catheter, flush with 5 mL of saline and discard the first 5 mL of blood collected before collecting the specimen for coagulation testing.

Blood should not be collected from heparinized lines.

Collect:
    Blue top filled to full extent of vacuum
Amount to Collect:
    2.7 mL blood
Sample Type:
    Citrated Plasma
Preferred Volume:
    1 mL plasma
Minimum Volume:
    0.5 mL plasma
Rejection Criteria:
    Sample received thawed.
Unacceptable Conditions:
    Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Specimen Preparation:
    Forward blue top to Hematology for processing. Aliquot separated plasma into 1 mL sample and freeze in plastic tubes at -20C. Platelet contamination of a test sample will tend to falsely elevate results. Ship on dry ice to China Basin sendout M-F for processing to Quest or LabCorp Ref. Labs. Order Quest test # 59766P, if B/T patient order BTMOLT, order LabCorp test # 500057.

Units:
    ng/mL
Reference Interval:
    4-43 ng/mL
Synonyms:
    • PAI-1 antigen
Stability (from collection to initiation):
    Room temperature 8 hours, refrigerated 3 days, frozen at -20C 6 months.
Reported:
    Set up Wednesday and Friday; Report available: 3 days
Additional Information:
    Deep vein thrombosis and coronary artery disease have been variably associated with increased PAI-1 levels. Elevated PAI-1 levels my help predict risk of reinfarction in survivors of myocardial infarction, particularly in young individuals.

    Deficiency of PAI-1, a rare condition that is difficult to diagnose, has been associated with a bleeding diathesis.

    As an acute phase reactant, the activity is increased after an acute event. Elevated levels may also be seen in diabetes and pregnancy.

    Studies suggest PAI-1 may be prognostic marker in early stage breast cancer.

CPT Codes:
    85414-90
LOINC Codes:
22758-7
Plasminogen Activity
PLMA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Spectrophotometric (chromogenic substrate)
Reported:
Test run on Tuesday and Thursday evenings. Turnaround time: 3-7 days.
Additional Information:
The activated form of plasminogen, plasmin, lyases fibrin clots. Plasminogen activity is increased in pregnancy and as an acute phase reactant. Rare hereditary deficiency of plasminogen predisposes to ligneous conjunctivitis. Low activity is associated with DIC, liver disease, and increased risk of thrombosis.

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum x2
Amount to Collect:
5.4 mL blood
Preferred Volume:
2 mL plasma
Minimum Volume:
1 mL plasma
Remarks:
Note the time of draw on requisition.
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 1 month.
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

PROCESSING

Test Code:
PLMA
Test Group:
Plasminogen
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Process immediately and transfer to a plastic tube w/ a plastic pipet. Freeze at -20C. Order Quest # 59709P

**Preferred Volume:**

2 mL plasma

**Minimum Volume:**

1 mL plasma

**Unacceptable Conditions:**

Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

**Stability (from collection to initiation):**

Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 1 month.

---

**RESULT INTERPRETATION**

**Units:**

% activity

**Reference Interval:**

65-176%

**Additional Information:**

The activated form of plasminogen, plasmin, lyses fibrin clots. Plasminogen activity is increased in pregnancy and as an acute phase reactant. Rare hereditary deficiency of plasminogen predisposes to ligneous conjunctivitis. Low activity is associated with DIC, liver disease, and increased risk of thrombosis.

---

**ADMINISTRATIVE**

**CPT Codes:**

85420-90

**LOINC Codes:**

28660-9

---

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

PLMA

**Test Group:**

Plasminogen

**Performing Lab:**

Quest

**Sendout:**

Yes

**Methodology:**

Spectrophotometric (chromogenic substrate)

**Remarks:**

Note the time of draw on requisition.

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Collect:**

Blue top filled to full extent of vacuum x2

**Amount to Collect:**

5.4 mL blood

**Sample Type:**
Citrated plasma

**Preferred Volume:**
- 2 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed sample.

**Specimen Preparation:**
- Process immediately and transfer to a plastic tube w/ a plastic pipet. Freeze at -20C. Order Quest # 59709P

**Units:**
- % activity

**Reference Interval:**
- 65-176%

**Stability (from collection to initiation):**
- Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 1 month.

**Reported:**
- Test run on Tuesday and Thursday evenings. Turnaround time: 3-7 days.

**Additional Information:**
- The activated form of plasminogen, plasmin, lyses fibrin clots. Plasminogen activity is increased in pregnancy and as an acute phase reactant. Rare hereditary deficiency of plasminogen predisposes to ligneous conjunctivitis. Low activity is associated with DIC, liver disease, and increased risk of thrombosis.

**CPT Codes:**
- 85420-90

**LOINC Codes:**
- 28660-9
Plasminogen Antigen
PLMI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Fixed time nephelometry
Reported:
Test run Tuesday and Friday mornings. Turnaround: 3-7 days.

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is required.
Sample Type:
Citrated plasma (EDTA plasma acceptable)
Collect:
Blue top filled to full extent of vacuum, Lavender top
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
PLMI
Test Group:
Plasminogen
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge within one hour of blood draw at 3200 rpm for 15 min. Remove plasma using plastic pipet and freeze immediately at -20C.
Order Quest # 59915P
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
8-14 mg/dL

ADMINISTRATIVE

CPT Codes:
85421-90
LOINC Codes:
4668-0

COMPLETE VIEW

Available Stat:
No
Test Code:
PLMI
Test Group:
Plasminogen
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Fixed time nephelometry
Patient Preparation:
An 8 hour fast before specimen collection is required.
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
Collect:
Blue top filled to full extent of vacuum, Lavender top
Amount to Collect:
2.7 mL blood
Sample Type:
Citrated plasma (EDTA plasma acceptable)
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Specimen Preparation:
Centrifuge within one hour of blood draw at 3200 rpm for 15 min. Remove plasma using plastic pipet and freeze immediately at -20C. Order Quest # 59915P
Units:
  mg/dL
Reference Interval:
  8-14 mg/dL
Reported:
  Test run Tuesday and Friday mornings. Turnaround: 3-7 days.
CPT Codes:
  85421-90
LOINC Codes:
  4668-0
Platelet Aggregation

ORDERING

Approval Required:
No, but only run by appointment, Contact Hematology at x3-1747

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Run as needed, Monday - Friday day shift only

Reported:
1-3 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Measures the release of ATP in the presence of thrombin, collagen and ATP and examines the aggregation response to Thrombin, ADP, arachidonic acid, collagen, and ristocetin at various concentrations:

<table>
<thead>
<tr>
<th>Agonist</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombin</td>
<td>1 Unit</td>
</tr>
<tr>
<td>ADP</td>
<td>5 µM</td>
</tr>
<tr>
<td>ADP</td>
<td>10 µM</td>
</tr>
<tr>
<td>Collagen</td>
<td>1 µg/mL</td>
</tr>
<tr>
<td>Collagen</td>
<td>5 µg/mL</td>
</tr>
<tr>
<td>Arachidonic Acid</td>
<td>0.5 mM</td>
</tr>
<tr>
<td>Ristocetin</td>
<td>1.0 mg/mL</td>
</tr>
</tbody>
</table>

A platelet count and pathologist evaluation of platelet morphology on a stained blood smear are required for the performance of this assay and will be ordered and separately charged.

If platelet aggregation is ordered without further specification, a full panel of agonists will be run and interpreted:
- If assessment of clopidogrel response is desired, specify "platelet aggregation for clopidogrel response." A 5 micromolar ADP study will be performed and interpreted.
- If assessment of aspirin response is desired, specify "platelet aggregation for aspirin response." 1 microgram/mL collagen and 5 microgram/mL collagen studies will be performed and interpreted.
- Other combinations of particular agonists can be specifically requested when a full panel of agonists is not needed; conferring with a hematology laboratory physician is requested in this circumstance x3-1747

Synonyms:
- lumi-aggregation
- platelet aggregation with luminescence
- clopidogrel
- plavix
- aspirin
- ASA

COLLECTION

Patient Preparation:
Patient should be rested, fasting since midnight, and no smoking before blood collection. No caffeine and no alcohol for 48 hours prior to testing. Take only medication as directed by physician before testing.

Sample Type:
Citrated and EDTA anticoagulated whole blood

Collect:
Blue tops (x6) and Lavender top

**Amount to Collect:**
20 mL blood

**Preferred Volume:**
20 mL blood

**Minimum Volume:**
17 mL blood

**Remarks:**
By appointment only, contact Hematology at x3-1747

Samples are only collected by Hematology techs.

**Note:** If aggregation testing using less than the full set of agonists is desired, including limited testing for response to aspirin or ADP-receptor antagonists, see “Additional Information” and note specific requests on requisition.

**Stability (from collection to initiation):**
Room temperature 3 hours.

---

**PROCESSING**

**Test Code:**
AGGR

**Test Group:**
Platelet function

**Performing Lab:**
Parnassus Hematology

**Preferred Volume:**
20 mL blood

**Minimum Volume:**
17 mL blood

**Stability (from collection to initiation):**
Room temperature 3 hours.

---

**RESULT INTERPRETATION**

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Measures the release of ATP in the presence of thrombin, collagen and ATP and examines the aggregation response to Thrombin, ADP, arachidonic acid, collagen, and ristocetin at various concentrations:

<table>
<thead>
<tr>
<th>Agonist</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombin</td>
<td>1 Unit</td>
</tr>
<tr>
<td>ADP</td>
<td>5 µM</td>
</tr>
<tr>
<td>ADP</td>
<td>10 µM</td>
</tr>
<tr>
<td>Collagen</td>
<td>1 µg/mL</td>
</tr>
<tr>
<td>Collagen</td>
<td>5 µg/mL</td>
</tr>
<tr>
<td>Arachidonic Acid</td>
<td>0.5 mM</td>
</tr>
<tr>
<td>Ristocetin</td>
<td>1.0 mg/mL</td>
</tr>
</tbody>
</table>

A platelet count and pathologist evaluation of platelet morphology on a stained blood smear are required for the performance of this assay and will be ordered and separately charged.

If platelet aggregation is ordered without further specification, a full panel of agonists will be run and interpreted:
- If assessment of clopidogrel response is desired, specify “platelet aggregation for clopidogrel response.” A 5 micromolar ADP study will be performed and interpreted.
- If assessment of aspirin response is desired, specify “platelet aggregation for aspirin response.” 1 microgram/mL collagen and 5 microgram/mL collagen studies will be performed and interpreted.
- Other combinations of particular agonists can be specifically requested when a full panel of agonists is not needed; conferring with a hematology laboratory physician is requested in this circumstance x3-1747
**ADMINISTRATIVE**

CPT Codes:
- 85576

LOINC Codes:
- 48805-6

**COMPLETE VIEW**

Approval Required:
- No, but only run by appointment, Contact Hematology at x3-1747

Available Stat:
- No

Test Code:
- AGGR

Test Group:
- Platelet function

Performing Lab:
- Parnassus Hematology

Performed:
- Run as needed, Monday - Friday day shift only

Patient Preparation:
- Patient should be rested, fasting since midnight, and no smoking before blood collection. No caffeine and no alcohol for 48 hours prior to testing. Take only medication as directed by physician before testing.

Remarks:
- By appointment only, contact Hematology at x3-1747
- Samples are only collected by Hematology techs.

**Note:** If aggregation testing using less than the full set of agonists is desired, including limited testing for response to aspirin or ADP-receptor antagonists, see "Additional Information" and note specific requests on requisition.

Collect:
- Blue tops (x6) and Lavender top

Amount to Collect:
- 20 mL blood

Sample Type:
- Citrated and EDTA anticoagulated whole blood

Preferred Volume:
- 20 mL blood

Minimum Volume:
- 17 mL blood

Synonyms:
- lumi-aggregation
- platelet aggregation with luminescence
- clopidogrel
- plavix
- aspirin
- ASA

Stability (from collection to initiation):
- Room temperature 3 hours.

Reported:
- 1-3 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Measures the release of ATP in the presence of thrombin, collagen and ATP and examines the aggregation response to Thrombin, ADP, arachidonic acid, collagen, and ristocetin at various concentrations:

<table>
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<tr>
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<td>1 µg/mL</td>
</tr>
<tr>
<td>Collagen</td>
<td>5 µg/mL</td>
</tr>
<tr>
<td>Arachidonic Acid</td>
<td>0.5 mM</td>
</tr>
<tr>
<td>Ristocetin</td>
<td>1.0 mg/mL</td>
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</tbody>
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A platelet count and pathologist evaluation of platelet morphology on a stained blood smear are required for the performance of this assay and will be ordered and separately charged.

If platelet aggregation is ordered without further specification, a full panel of agonists will be run and interpreted:
- If assessment of clopidogrel response is desired, specify "platelet aggregation for clopidogrel response." A 5 micromolar ADP study will be performed and interpreted.
- If assessment of aspirin response is desired, specify "platelet aggregation for aspirin response." 1 microgram/mL collagen and 5 microgram/mL collagen studies will be performed and interpreted.
- Other combinations of particular agonists can be specifically requested when a full panel of agonists is not needed; conferring with a hematology laboratory physician is requested in this circumstance x3-1747

CPT Codes:
85576

LOINC Codes:
48805-6
Platelet Count
PLT, CBC, CBCD, PLTM

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Flow cytometry and/or Phase microscopy
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
The less precise manual method is usually performed and billed (PLTM) when required by an intrinsic abnormality of the specimen.
In the presence of clumping, only platelet counts > 100 x10^9/L are reported.
Platelet estimates derived from a manual review of a peripheral blood slide are released only in cases in which the presence of white blood cell fragments and high numbers of giant platelets negate the use of both the automated machine and phase platelet analysis for generation of a platelet count. Manual platelet counts at low platelet values are subject to high precision errors because of the low number of platelets counted. Therefore, clinical correlation is advised.

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL blood
Minimum Volume:
250 µl in pedi-bullet
Remarks:
Collect the specimen in a blue top (citrate) tube if platelets are repeatedly found to clump in samples collected in a lavender top (EDTA).
When platelets clump in both EDTA and citrate tubes, and the count is < 100 and a physician specifically orders the procedure, a count will be run on a fingerstick sample collected directly into a Thrombo-tic®.

PROCESSING

Test Code:
PLT, CBC, CBCD, PLTM
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
1 mL blood
Minimum Volume:
250 µl in pedi-bullet

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
\(x10^9/L\)

**Reference Interval:**
140-450 \(x10^9/L\)

**Critical Values:**
- \(\leq 10 \times 10^9/L\): Always called
- \(\leq 25 \times 10^9/L\): Called if new finding within previous 24 hours.

**Additional Information:**
The less precise manual method is usually performed and billed (PLTM) when required by an intrinsic abnormality of the specimen.

In the presence of clumping, only platelet counts > 100 \(x10^9/L\) are reported.

Platelet estimates derived from a manual review of a peripheral blood slide are released only in cases in which the presence of white blood cell fragments and high numbers of giant platelets negate the use of both the automated machine and phase platelet analysis for generation of a platelet count. Manual platelet counts at low platelet values are subject to high precision errors because of the low number of platelets counted. Therefore, clinical correlation is advised.

---

### COMPLETE VIEW

**Available Stat:**
Yes

**Test Code:**
PLT, CBC, CBCD, PLTM

**Performing Lab:**
Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Flow cytometry and/or Phase microscopy

**Remarks:**
Collect the specimen in a blue top (citrate) tube if platelets are repeatedly found to clump in samples collected in a lavender top (EDTA).

When platelets clump in both EDTA and citrate tubes, and the count is < 100 and a physician specifically orders the procedure, a count will be run on a fingerstick sample collected directly into a Thrombo-tic®.

**Collect:**
Lavender top

**Amount to Collect:**
1 mL blood

**Sample Type:**
EDTA whole blood

**Preferred Volume:**
1 mL blood

**Minimum Volume:**
250 \(\mu\)l in pedi-bullet

**Units:**
\(x10^9/L\)

**Reference Interval:**
140-450 \(x10^9/L\)

**Critical Values:**
- \(\leq 10 \times 10^9/L\): Always called
- \(\leq 25 \times 10^9/L\): Called if new finding within previous 24 hours.

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**

Printed 06/07/19
Test information subject to change
The less precise manual method is usually performed and billed (PLTM) when required by an intrinsic abnormality of the specimen.

In the presence of clumping, only platelet counts > 100 x10^9/L are reported.

Platelet estimates derived from a manual review of a peripheral blood slide are released only in cases in which the presence of white blood cell fragments and high numbers of giant platelets negate the use of both the automated machine and phase platelet analysis for generation of a platelet count. Manual platelet counts at low platelet values are subject to high precision errors because of the low number of platelets counted. Therefore, clinical correlation is advised.
Platelet Crossmatch
XMPLAT

ORDERING

Approval Required:
Yes, contact Blood Bank

Available Stat:
No

Performing Lab:
American Red Cross Immunohematology Reference Laboratory

Methodology:
Solid Phase Red cell Adherance (Capture-P® IMMUCOR)

Reported:
Results of crossmatch test are available the same afternoon (Mon-Fri). However, anticipate a 1-2 day delay in platelet availability as products must undergo bacterial and infectious marker testing.

Additional Information:
Test is not available Sat-Sun or on Holidays. Reserved for patients who are refractory to platelet transfusions. Requires pre-approval of Lab Medicine Resident (X3-1313). Please see lab manual's Transfusion Medicine Guide for details.

COLLECTION

Sample Type:
EDTA whole blood

Collect:
Large Lavender top (6 mL)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL whole blood

Remarks:
Specimens must be collected early on morning of testing (Mon-Fri ONLY) and delivered to the Blood Bank no later than 11 AM

Unacceptable Conditions:
Unsigned samples will be rejected. Samples collected >24 hours before testing will be rejected. Testing is performed at 1PM Mon-Fri.

PROCESSING

Test Code:
XMPLAT

Sendout:
Yes

Performing Lab:
American Red Cross Immunohematology Reference Laboratory

Specimen Preparation:
Samples must be shipped to American Red Cross by no later than noon Mon-Fri.

Preferred Volume:
6 mL whole blood

Unacceptable Conditions:
Unsigned samples will be rejected. Samples collected >24 hours before testing will be rejected. Testing is performed at 1PM Mon-Fri.

RESULT INTERPRETATION

Reference Interval:
Compatible with ALL donors tested
Additional Information:
Test is not available Sat-Sun or on Holidays. Reserved for patients who are refractory to platelet transfusions. Requires pre-approval of Lab Medicine Resident (X3-1313). Please see lab manual’s Transfusion Medicine Guide for details.

ADMINISTRATIVE

CPT Codes:
86022-90

LOINC Codes:
45370-4

COMPLETE VIEW

Approval Required:
Yes, contact Blood Bank

Available Stat:
No

Test Code:
XMPLAT

Performing Lab:
American Red Cross Immunohematology Reference Laboratory

Sendout:
Yes

Methodology:
Solid Phase Red cell Adherance (Capture-P® IMMUCOR)

Remarks:
Specimens must be collected early on morning of testing (Mon-Fri ONLY) and delivered to the Blood Bank no later than 11 AM

Collect:
Large Lavender top (6 mL)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL whole blood

Unacceptable Conditions:
Unsigned samples will be rejected. Samples collected >24 hours before testing will be rejected. Testing is performed at 1PM Mon-Fri.

Specimen Preparation:
Samples must be shipped to American Red Cross by no later than noon Mon-Fri.

Reference Interval:
Compatible with ALL donors tested

Reported:
Results of crossmatch test are available the same afternoon (Mon-Fri). However, anticipate a 1-2 day delay in platelet availability as products must undergo bacterial and infectious marker testing.

Additional Information:
Test is not available Sat-Sun or on Holidays. Reserved for patients who are refractory to platelet transfusions. Requires pre-approval of Lab Medicine Resident (X3-1313). Please see lab manual's Transfusion Medicine Guide for details.

CPT Codes:
86022-90

LOINC Codes:
45370-4
Platelet Derived Growth Factor Receptor Alpha 4Q12 Rearrangement FISH
PDGFRA, BPDGA

ORDERING

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Monday - Friday (day shift)

Methodology:
Fluorescence in situ Hybridization (FISH)

Reported:
1-2 weeks

Synonyms:
- PDGFR-Alpha
- PDGFRA
- BPDGA

COLLECTION

Sample Type:
Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy

Collect:
Dark green top vacutainer

Amount to Collect:
See preferred volume.

Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm

Minimum Volume:
- Whole blood: 1 ml
- Bone marrow: 1 ml
- Bone core: 1 cm

Remarks:
Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature

Stability (from collection to initiation):
2 days

Unacceptable Conditions:
Frozen cracked, leaking or unlabeled samples

PROCESSING

Test Code:
BPDGA: Blood
PDGFRA: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm

Minimum Volume:
Whole blood: 1 ml

Printed 06/07/19
Test information subject to change
Bone marrow: 1 ml
Bone core: 1 cm

Unacceptable Conditions:
- Frozen cracked, leaking or unlabeled samples

Stability (from collection to initiation):
- 2 days

ADMINISTRATIVE

CPT Codes:
- 88271 x3, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Test Code:
- BPDGA: Blood
- PDGFRA: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Monday - Friday (day shift)

Methodology:
- Fluorescence in situ Hybridization (FISH)

Remarks:
- Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature

Collect:
- Dark green top vacutainer

Amount to Collect:
- See preferred volume.

Sample Type:
- Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy

Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm

Minimum Volume:
- Whole blood: 1 ml
- Bone marrow: 1 ml
- Bone core: 1 cm

Unacceptable Conditions:
- Frozen cracked, leaking or unlabeled samples

Synonyms:
- PDGFR-Alpha
- PDGFRA
- BPDGA

Stability (from collection to initiation):
- 2 days

Reported:
- 1-2 weeks

CPT Codes:
- 88271 x3, 88275

LDT or Modified FDA:
- Yes
Platelet Derived Growth Factor Receptor Beta 5Q33.1 Rearrangement FISH
PDGFRB, BPDGB

ORDERING

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Monday - Friday (day shift)

Methodology:
Fluorescence in situ Hybridization (FISH)

Reported:
1-2 weeks

Synonyms:
- PDGFR-Beta
- PDGFRB
- BPDGB

COLLECTION

Sample Type:
Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy

Collect:
Dark green top vacutainer

Amount to Collect:
See preferred volume

Preferred Volume:
Whole blood: 2 ml
Bone marrow: 2 ml
Bone core: 2 cm

Minimum Volume:
Whole blood: 1 ml
Bone marrow: 1 ml
Bone core: 1 cm

Remarks:
Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature

Stability (from collection to initiation):
2 days

Unacceptable Conditions:
Frozen cracked, leaking or unlabeled samples

PROCESSING

Test Code:
BPDGB: Blood
PDGFRB: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Preferred Volume:
Whole blood: 2 ml
Bone marrow: 2 ml
Bone core: 2 cm

Minimum Volume:
Whole blood: 1 ml
Bone marrow: 1 ml
Bone core: 1 cm

Unacceptable Conditions:
- Frozen cracked, leaking or unlabeled samples

Stability (from collection to initiation):
- 2 days

**ADMINISTRATIVE**

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes

**COMPLETE VIEW**

Test Code:
- BPDGB: Blood
- PDGFRB: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Monday - Friday (day shift)

Methodology:
- Fluorescence in situ Hybridization (FISH)

Remarks:
- Make sure blood or marrow aspirate is well mixed in the Dark Green top. Keep sample at room temperature

Collect:
- Dark green top vacutainer

Amount to Collect:
- See preferred volume

Sample Type:
- Heparinized whole blood, Bone marrow aspirate, Bone marrow biopsy

Preferred Volume:
- Whole blood: 2 ml
- Bone marrow: 2 ml
- Bone core: 2 cm

Minimum Volume:
- Whole blood: 1 ml
- Bone marrow: 1 ml
- Bone core: 1 cm

Unacceptable Conditions:
- Frozen cracked, leaking or unlabeled samples

Synonyms:
- PDGFR-Beta
- PDGFRB
- BPDGB

Stability (from collection to initiation):
- 2 days

Reported:
- 1-2 weeks

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes
Platelet Mapping
PLTMAP

ORDERING

Ordering Recommendations:
For meaningful use, it is recommended to order a concurrent Platelet Count and Fibrinogen for Platelet Mapping orders.

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.

Performing Lab:
Mission Bay Hematology

Performed:
By appointment only, 0800-1530 daily

Reported:
4 hours

COLLECTION

Sample Type:
Whole blood

Collect:
Blue top (citrate) AND Green top (sodium heparin)

Amount to Collect:
Blue top: 2.7 mL
Green top: 3 mL

Minimum Volume:
Blue top: 2.7 mL
Green top: 3 mL

Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology Laboratory.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

PROCESSING

Test Code:
PLTMAP

Performing Lab:
Mission Bay Hematology

Minimum Volume:
Blue top: 2.7 mL
Green top: 3 mL

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.
Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

RESULT INTERPRETATION

Units:
- % ADP Inhibition
- % AA Inhibition

Reference Interval:
The platelet mapping assay has no established normal range and has not been approved by the FDA for pediatric use. Results should be compared with baseline results and should not be used as the sole basis for patient diagnosis. Platelet mapping results should be considered along with a clinical assessment of the patient's condition and other coagulation laboratory tests.

ADMINISTRATIVE

CPT Codes:
- 85576-2

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.

Ordering Recommendations:
For meaningful use, it is recommended to order a concurrent Platelet Count and Fibrinogen for Platelet Mapping orders.

Test Code:
- PLTMAP

Performing Lab:
Mission Bay Hematology

Performed:
By appointment only, 0800-1530 daily

Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology Laboratory.

Collect:
Blue top (citrate) AND Green top (sodium heparin)

Amount to Collect:
- Blue top: 2.7 mL
- Green top: 3 mL

Sample Type:
Whole blood

Minimum Volume:
- Blue top: 2.7 mL
- Green top: 3 mL

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

Units:
% ADP Inhibition
% AA Inhibition

Reference Interval:
The platelet mapping assay has no established normal range and has not been approved by the FDA for pediatric use. Results should be compared with baseline results and should not be used as the sole basis for patient diagnosis. Platelet mapping results should be considered along with a clinical assessment of the patient's condition and other coagulation laboratory tests.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Reported:
4 hours

CPT Codes:
85576-2

LDT or Modified FDA:
Yes
Platelet Transfusion Refractory Panel
MOLT

ORDERING

Approval Required:
Yes; Blood Bank approval required before order is placed and sample is collected.

Performing Lab:
Versiti

Methodology:
PCR and Fluorescent Hydrolysis Probes; Platelet Antibody Bead Array (PABA); and Flow Cytometry

Reported:
10 days

COLLECTION

Sample Type:
Blood

Collect:
2 lavender and 2 red tops

Amount to Collect:
See Preferred Volume

Preferred Volume:
5-10 mL EDTA whole blood and 10 mL serum

Minimum Volume:
3 mL EDTA whole blood and 3 mL serum

Remarks:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
Versiti

Specimen Preparation:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

Store refrigerated. Send sample refrigerated. Sample must be received within 4 days of draw date.

Preferred Volume:
5-10 mL EDTA whole blood and 10 mL serum

Minimum Volume:
3 mL EDTA whole blood and 3 mL serum

ADMINISTRATIVE
CPT Codes:
81105, 81106, 81107, 81108, 81109, 81110, 81111, 81112, 86022

COMPLETE VIEW

Approval Required:
Yes; Blood Bank approval required before order is placed and sample is collected.

Test Code:
MOLT

Performing Lab:
Versiti

Sendout:
Yes

Methodology:
PCR and Fluorescent Hydrolysis Probes; Platelet Antibody Bead Array (PABA); and Flow Cytometry

Remarks:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

Collect:
2 lavender and 2 red tops

Amount to Collect:
See Preferred Volume

Sample Type:
Blood

Preferred Volume:
5-10 mL EDTA whole blood and 10 mL serum

Minimum Volume:
3 mL EDTA whole blood and 3 mL serum

Specimen Preparation:
Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

Store refrigerated. Send sample refrigerated. Sample must be received within 4 days of draw date.

Reported:
10 days

CPT Codes:
81105, 81106, 81107, 81108, 81109, 81110, 81111, 81112, 86022
PML/RARA (15;17) translocation FISH
TR1517, BT1517

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Medical Genomics - Cytogenetics

**Methodology:**
Fluorescent in-situ hybridization

**Reported:**
7-14 days

**Synonyms:**
- Cytogenetic analysis
- Karyotype
- Karyotyping
- TR1517
- BT1517

**COLLECTION**

**Sample Type:**
Heparinized whole blood, bone marrow, bone core

**Collect:**

Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

**Amount to Collect:**

Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm

**Preferred Volume:**

Bone marrow: 2 mL
Blood: 2 mL
Bone core: 2 cm

**Minimum Volume:**

Bone marrow: 1 mL
Blood: 1 mL
Bone core: 1 cm

**Remarks:**

Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.

Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.

If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube of peripheral blood.

Contact Hematology if the specimen is more than 24 hours old.

**Stability (from collection to initiation):**
48 hours

**Unacceptable Conditions:**
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**PROCESSING**

**Test Code:**
- BT1517: Blood
- TR1517: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Specimen Preparation:**
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

**Preferred Volume:**
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

**Minimum Volume:**
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm

**Unacceptable Conditions:**
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Stability (from collection to initiation):**
48 hours

**RESULT INTERPRETATION**

**Reference Interval:**
Not detected

**ADMINISTRATIVE**

**CPT Codes:**
- 88275, 88271x2

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
21551-7

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
- BT1517: Blood
- TR1517: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Methodology:**
Fluorescent in-situ hybridization

**Remarks:**
Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.

Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.

If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube
of peripheral blood.

Contact Hematology if the specimen is more than 24 hours old.

Collect:
- Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics, 415-353-4844. Dark Green top also acceptable
- Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

Sample Type:
- Heparinized whole blood, bone marrow, bone core

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 2 mL
- Bone core: 2 cm

Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:
- Not detected

Synonyms:
- Cytogenetic analysis
- Karyotype
- Karyotyping
- TR1517
- BT1517

Stability (from collection to initiation):
- 48 hours

Reported:
- 7-14 days

CPT Codes:
- 88275, 88271x2

LDT or Modified FDA:
- Yes

LOINC Codes:
- 21551-7
PML-RARA Translocation Quantitative
PMLQNT

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Run 1x per week as needed, Tuesday or Thursday, day shift only.
Methodology:
Real-Time PCR
Reported:
7-10 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

This assay determines relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The quantitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

NOTE: The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Reflex Testing:
If the PML-RARA Quantitative test (PMLQNT) is ordered and the patient has not had a prior qualitative test (PMLR) performed, the qualitative analysis will be performed first to identify if a translocation is present and what type it is prior to quantitative analysis. The qualitative testing will be performed at an additional charge.

Synonyms:
- Acute Promyelocytic leukemia
- APL
- AML-M3
- t(15
- 17)
- Retinoic acid receptor alpha

COLLECTION

Sample Type:
EDTA Whole blood, bone marrow
Collect:
Lavender top
Amount to Collect:
Blood: 5 mL
Bone marrow: 2 mL
Preferred Volume:
- Blood: 5 mL
- Bone marrow: 2 mL

Minimum Volume:
- Blood: 2 mL
- Bone marrow: 1 mL

Remarks:
Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):
Refrigerated 3 days.

PROCESSING

Test Code:
PMLQNT

Performing Lab:
Medical Genomics - Molecular Diagnostics

Specimen Preparation:
Refrigerate sample and send the China basin refrigerated.

Preferred Volume:
- Blood: 5 mL
- Bone marrow: 2 mL

Minimum Volume:
- Blood: 2 mL
- Bone marrow: 1 mL

Stability (from collection to initiation):
Refrigerated 3 days.

RESULT INTERPRETATION

Units:
% PML/RARA transcripts to ABL transcripts

Reference Interval:
No PML-RARA bcr1, bcr2 or bcr3 fusion transcripts

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

This assay determines relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The quantitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

NOTE: The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.
CPT Codes: 81316  
LDT or Modified FDA: Yes

### COMPLETE VIEW

**Available Stat:** No  
**Test Code:** PMLQNT  
**Performing Lab:** Medical Genomics - Molecular Diagnostics  
**Performed:** Run 1x per week as needed, Tuesday or Thursday, day shift only.  
**Methodology:** Real-Time PCR  
**Remarks:** Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Collect:** Lavender top  
**Amount to Collect:**  
- Blood: 5 mL  
- Bone marrow: 2 mL  
**Sample Type:** EDTA Whole blood, bone marrow  
**Preferred Volume:**  
- Blood: 5 mL  
- Bone marrow: 2 mL  
**Minimum Volume:**  
- Blood: 2 mL  
- Bone marrow: 1 mL  
**Specimen Preparation:** Refrigerate sample and send the China basin refrigerated.  
**Units:** % PML/RARA transcripts to ABL transcripts  
**Reference Interval:**  
- No PML-RARA bcr1, bcr2 or bcr3 fusion transcripts  
**Synonyms:**  
- Acute Promyelocytic leukemia  
- APL  
- AML-M3  
- t(15  
  - 17)  
- Retinoic acid receptor alpha  
**Stability (from collection to initiation):** Refrigerated 3 days.  
**Reported:** 7-10 days  
**Reflex Testing:** If the PML-RARA Quantitative test (PMLQNT) is ordered and the patient has not had a prior qualitative test (PMLR) performed, the
qualitative analysis will be performed first to identify if a translocation is present and what type it is prior to quantitative analysis. The qualitative testing will be performed at an additional charge.

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

This assay determines relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The quantitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

NOTE: The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
81316

LDT or Modified FDA:
Yes
**PML-RARA, Qualitative**

**ORDERING**

Available Stat: No

Performing Lab: Medical Genomics - Molecular Diagnostics

Performed: Run 1x per week as needed, Monday or Wednesday, day shift only.

Methodology: PCR

Reported: 7-10 days

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

If this assay is positive, the follow-up quantitative assay (PMLQNT) will be performed to determine relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The qualitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Qualitative results are reported either as negative or positive. Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

NOTE: The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**Reflex Testing:**

If a translocation is detected the quantitative assay (PMLQNT) will be performed at an additional charge.

**Note:** If the patient has a prior positive qualitative test (PMLR), the order will be changed to the quantitative test (PMLQNT).

**Synonyms:**

- Acute Promyelocytic leukemia
- APL
- AML-M3
- t(15
- 17)
- Retinoic acid receptor alpha

**COLLECTION**

Sample Type: EDTA Whole blood, bone marrow

Collect: Lavender top

Amount to Collect: Blood: 5 mL
Bone marrow: 2 mL

**Preferred Volume:**
- Blood: 5 mL
- ?Bone marrow: 2 mL

**Minimum Volume:**
- Blood: 2 mL
- ?Bone marrow: 1 mL

**Remarks:**
Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Stability (from collection to initiation):**
- Refrigerated 3 days.

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**PROCESSING**

**Test Code:**
- PMLR

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
- Refrigerate sample. Send to China Basin refrigerated

**Preferred Volume:**
- Blood: 5 mL
- ?Bone marrow: 2 mL

**Minimum Volume:**
- Blood: 2 mL
- ?Bone marrow: 1 mL

**Stability (from collection to initiation):**
- Refrigerated 3 days.

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**RESULT INTERPRETATION**

**Reference Interval:**
- No PML-RARA bcr1, bcr2 or bcr3 fusion transcripts

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

If this assay is positive, the follow-up quantitative assay (PMLQNT) will be performed to determine relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The qualitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Qualitative results are reported either as negative or positive. Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

**NOTE:** The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

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**ADMINISTRATIVE**

Printed 06/07/19
Test information subject to change
CPT Codes:
81315

LDT or Modified FDA:
Yes

LOINC Codes:
21551-7

COMPLETE VIEW

Available Stat:
No

Test Code:
PMLR

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1x per week as needed, Monday or Wednesday, day shift only.

Methodology:
PCR

Remarks:
Due to limited stability samples for this test should not be collected the day before a holiday or 3-day weekend.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top

Amount to Collect:
Blood: 5 mL
Bone marrow: 2 mL

Sample Type:
EDTA Whole blood, bone marrow

Preferred Volume:
Blood: 5 mL
?Bone marrow: 2 mL

Minimum Volume:
Blood: 2 mL
?Bone marrow: 1 mL

Specimen Preparation:
Refrigerate sample. Send to China Basin refrigerated

Reference Interval:
No PML-RARA bcr1, bcr2 or bcr3 fusion transcripts

Synonyms:
- Acute Promyelocytic leukemia
- APL
- AML-M3
- t(15
- 17)
- Retinoic acid receptor alpha

Stability (from collection to initiation):
Refrigerated 3 days.

Reported:
7-10 days

Reflex Testing:
If a translocation is detected the quantitative assay (PMLQNT) will be performed at an additional charge.
Note: If the patient has a prior positive qualitative test (PMLR), the order will be changed to the quantitative test (PMLQNT).

Additional Information:

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

More than 98% of acute promyelocytic leukemia (APL) cases are caused by three translocations, termed bcr1 (long form), bcr2 (variable form) and bcr3 (short form), which fuse the promyelocytic leukemia (PML) gene on chromosome 15q22 to the retinoic acid receptor alpha (RARA) gene on chromosome 17q21. This assay will detect all three translocations. Each translocation results in the expression of a chimeric PML-RARA protein that suppresses the maturation of myeloid cells at the promyelocytic stage.

If this assay is positive, the follow-up quantitative assay (PMLQNT) will be performed to determine relative mRNA levels of PML-RARA fusion transcripts for the purpose of monitoring therapeutic response in minimal residual disease. The qualitative assay has a sensitivity of 1 in 100,000 cells and an analytical detection sensitivity of 10 PML-RARA copies.

Qualitative results are reported either as negative or positive. Quantitative results are reported with a percent ratio consisting of PML-RARA transcripts normalized to the internal control ABL. Samples that fall outside the standard curve range, but are clearly positive will be reported as weak positive, without a PML-RARA ratio.

NOTE: The quantitative PML-RARA assay is best interpreted by periodic evaluations of PML-RARA transcript levels in the same laboratory. Quantitative values among different laboratories do not necessarily correlate together.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
81315

LDT or Modified FDA:
Yes

LOINC Codes:
21551-7
Pm-Scl Antibody

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunodiffusion
Reported:
6-7 days
Additional Information:
Scleroderma may be localized or diffuse [Progressive Systemic Sclerosis (PSS)] that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. PM-1 (PM-Scl) Antibody is present in approximately one-fourth of patients with the polymyositis/scleroderma overlap syndrome, 8% of patients with polymyositis alone and 2-5% of patients with scleroderma alone. Patients who have PM-1 Antibody have a better prognosis than patients with scleroderma.

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.
Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
PMSCL
Sendout:
Yes
Performing Lab:
Quest
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Collected in Gold top
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

RESULT INTERPRETATION
Reference Interval:
Negative

Additional Information:
Scleroderma may be localized or diffuse [Progressive Systemic Sclerosis (PSS)] that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. PM-1 (PM-Scl) Antibody is present in approximately one-fourth of patients with the polymyositis/scleroderma overlap syndrome, 8% of patients with polymyositis alone and 2-5% of patients with scleroderma alone. Patients who have PM-1 Antibody have a better prognosis than patients with scleroderma.

CPT Codes:
86235-90

Complete View

Available Stat:
No

Test Code:
PMSCL

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunodiffusion

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Collected in Gold top

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

Reported:
6-7 days

Additional Information:
Scleroderma may be localized or diffuse [Progressive Systemic Sclerosis (PSS)] that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. PM-1 (PM-Scl) Antibody is present in approximately one-fourth of patients with the polymyositis/scleroderma overlap syndrome, 8% of patients with polymyositis alone and 2-5% of patients with scleroderma alone. Patients who have PM-1 Antibody have a better prognosis than patients with scleroderma.

CPT Codes:
86235-90
Pneumococcal IgG Antibodies (14 serotypes)
APN14

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Multiple Analyte Immuno Detection (MAID)

Additional Information:
Serotypes tested for include: 1, 3, 4, 5, 8, 9 (9N), 12 (12F), 14, 19 (19F), 23 (23F), 26 (6B), 51 (7F), 56 (18C), 68 (9V)

Note: Serotype designations are American nomenclature, with Danish nomenclature in parenthesis.

The MAID procedure measures IgG antibodies recognizing 14 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.

Evaluation of response to vaccination is best accomplished by comparing Pre-vaccination levels and levels obtained 4-6 weeks post vaccination. A 2-fold to 4-fold increase in 70% of the pneumococcal serotypes vaccinated for in immunocompetent patients between the ages of 5 and 65 years. Adults over the age of 65 may respond with less than 2-fold increases in antibody levels.

Synonyms:
- Pneumococcal serology

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Pneumococcal vaccine response testing should be performed with paired pre- and post-vaccination sera. Please indicate on request form if the specimen is pre- or post-vaccination collections. Label samples "PRE" or "POST".

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 14 days, frozen at -20C 1 month.

PROCESSING

Test Code:
APN14
Test Group:
Pneumococcal
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze aliquot at -20C. Order Quest test # 19564X
Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 14 days, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:
See additional Information

Additional Information:
Serotypes tested for include: 1, 3, 4, 5, 8, 9 (9N), 12 (12F), 14, 19 (19F), 23 (23F), 26 (6B), 51 (7F), 56 (18C), 68 (9V)

Note: Serotype designations are American nomenclature, with Danish nomenclature in parenthesis.

The MAID procedure measures IgG antibodies recognizing 14 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.

Evaluation of response to vaccination is best accomplished by comparing Pre-vaccination levels and levels obtained 4-6 weeks post vaccination. A 2-fold to 4-fold increase in 70% of the pneumococcal serotypes vaccinated for in immunocompetent patients between the ages of 5 and 65 years. Adults over the age of 65 may respond with less than 2-fold increases in antibody levels.

ADMINISTRATIVE

CPT Codes:
86317-90 x14

LOINC Codes:
42771-6

COMPLETE VIEW

Available Stat:
No

Test Code:
APN14

Test Group:
Pneumococcal

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Multiple Analyte Immuno Detection (MAID)

Remarks:
Pneumococcal vaccine response testing should be performed with paired pre- and post-vaccination sera. Please indicate on request form if the specimen is pre- or post-vaccination collections. Label samples "PRE" or "POST".

Collect:
Gold top, Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Freeze aliquot at -20C. Order Quest test # 19564X

Units:
µg/mL (mcg/mL)

Reference Interval:
See additional Information

Synonyms:
• Pneumococcal serology

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 14 days, frozen at -20C 1 month.

Additional Information:
Serotypes tested for include: 1, 3, 4, 5, 8, 9 (9N), 12 (12F), 14, 19 (19F), 23 (23F), 26 (6B), 51 (7F), 56 (18C), 68 (9V)

Note: Serotype designations are American nomenclature, with Danish nomenclature in parenthesis.

The MAID procedure measures IgG antibodies recognizing 14 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.

Evaluation of response to vaccination is best accomplished by comparing Pre-vaccination levels and levels obtained 4-6 weeks post vaccination. A 2-fold to 4-fold increase in 70% of the pneumococcal serotypes vaccinated for in immunocompetent patients between the ages of 5 and 65 years. Adults over the age of 65 may respond with less than 2-fold increases in antibody levels.

CPT Codes:
86317-90 x14

LOINC Codes:
42771-6
Pneumococcal IgG Antibodies (23 serotypes)
APN23

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Multiple Analyte Immuno Detection (MAID)
Reported: Performed Monday-Friday. Turnaround 4-7 days.
Additional Information: Serotypes tested for include: 1,2,3,4,5,8,9 (9N),12(12F),14,17 (17F),19(19F),20,22 (22F),23(23F),26(6B),34(10A),43(11A),51(7F),54 (15B),56(18C),57(19A),68(9V),70 (33F)
    Note: Serotype designations are American nomenclature, with Danish nomenclature in parentheses
    The MAID procedure measures IgG antibodies recognizing 23 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.
    Evaluation of the response to pneumococcal vaccination is best accomplished by comparing pre-vaccination antibody levels and levels obtained 4-6 weeks post-vaccination. A 2- to 4-fold increase in type-specific antibodies measured 4-6 weeks after vaccination is expected in immunocompetent adults. The number of serotypes for which a 2- to 4-fold increase is observed varies greatly among individuals; a consensus panel has suggested that individuals older than 5 years should respond to at least approximately 70% of pneumococcal serotypes. Adults >65 years old may exhibit a smaller (2-fold) increase in type-specific antibody levels.
Synonyms: Pneumococcal serology

COLLECTION

Sample Type: Serum
Collect: Gold top, Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL
Minimum Volume: 0.5 mL
Remarks: Pneumococcal vaccine response testing should be performed with paired pre- and post-vaccination sera. Please indicate on request form if the specimen is pre- or post-vaccination collections. Label samples "PRE" or "POST".
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 months, frozen at -20C 1 month.

PROCESSING

Test Code: APN23
Test Group: Pneumococcal
Sendout: Yes
Performing Lab:
Quest

Specimen Preparation:
Freeze aliquot at -20C. Order Quest Test #16963

Preferred Volume:
1 mL

Minimum Volume:
0.5 mL

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 months, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:
See additional information

Additional Information:
Serotypes tested for include: 1,2,3,4,5,8,9 (9N),12(12F),14,17 (17F),19(19F),20,22 (22F),23(23F),26(6B),34(10A),43(11A),51(7F),54 (15B),56(18C),57(19A),68(9V),70 (33F)

Note: Serotype designations are American nomenclature, with Danish nomenclature in parentheses

The MAID procedure measures IgG antibodies recognizing 23 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.

Evaluation of the response to pneumococcal vaccination is best accomplished by comparing pre-vaccination antibody levels and levels obtained 4-6 weeks post-vaccination. A 2- to 4-fold increase in type-specific antibodies measured 4-6 weeks after vaccination is expected in immunocompetent adults. The number of serotypes for which a 2- to 4-fold increase is observed varies greatly among individuals; a consensus panel has suggested that individuals older than 5 years should respond to at least approximately 70% of pneumococcal serotypes. Adults >65 years old may exhibit a smaller (2-fold) increase in type-specific antibody levels.

ADMINISTRATIVE

CPT Codes:
86317-90 x23

COMPLETE VIEW

Available Stat:
No

Test Code:
APN23

Test Group:
Pneumococcal

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Multiple Analyte Immuno Detection (MAID)

Remarks:
Pneumococcal vaccine response testing should be performed with paired pre- and post-vaccination sera. Please indicate on request form if the specimen is pre- or post-vaccination collections. Label samples "PRE" or "POST".

Collect:
Gold top, Red top
Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL

Minimum Volume:
0.5 mL

Specimen Preparation:
Freeze aliquot at -20°C. Order Quest Test #16963

Units:
µg/mL (mcg/mL)

Reference Interval:
See additional information

Synonyms:
- Pneumococcal serology

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 months, frozen at -20°C 1 month.

 Reported:
Performed Monday-Friday. Turnaround 4-7 days.

Additional Information:
Serotypes tested for include: 1, 2, 3, 4, 5, 8, 9 (9N), 12(12F), 14, 17 (17F), 19(19F), 20, 22 (22F), 23(23F), 26(6B), 34(10A), 43(11A), 51(7F), 54 (15B), 56(18C), 57(19A), 68(9V), 70 (33F)

Note: Serotype designations are American nomenclature, with Danish nomenclature in parentheses

The MAID procedure measures IgG antibodies recognizing 23 type-specific pneumococcal polysaccharide antigens included in the polyvalent vaccine.

Evaluation of the response to pneumococcal vaccination is best accomplished by comparing pre-vaccination antibody levels and levels obtained 4-6 weeks post-vaccination. A 2- to 4-fold increase in type-specific antibodies measured 4-6 weeks after vaccination is expected in immunocompetent adults. The number of serotypes for which a 2- to 4-fold increase is observed varies greatly among individuals; a consensus panel has suggested that individuals older than 5 years should respond to at least approximately 70% of pneumococcal serotypes. Adults >65 years old may exhibit a smaller (2-fold) increase in type-specific antibody levels.

CPT Codes:
86317-90 x23
Pneumocystis carinii stain

ORDERING

Available Stat: No
Performing Lab: Cytology (Dept. of Pathology)
Methodology: PAP and Gomori methenamine silver (GMS) stains
Synonyms: PCP, Pneumocystis carinii pneumonia

COLLECTION

Sample Type: Sputum, Bronchialveolar lavage (BAL), Bronchial wash
Collect: Sputum cup, Lukens trap
Remarks: Complete a Non-Gyn Cytology Requisition and deliver with sample. From 0800-1630 deliver sample to M-545. After 1630 deliver to clinical laboratory processing, 5th floor Moffitt.

PROCESSING

Performing Lab: Cytology (Dept. of Pathology)
Specimen Preparation: If received on a Microbiology requisition forward it and sample to M-545.

COMPLETE VIEW

Available Stat: No
Performing Lab: Cytology (Dept. of Pathology)
Methodology: PAP and Gomori methenamine silver (GMS) stains
Remarks: Complete a Non-Gyn Cytology Requisition and deliver with sample. From 0800-1630 deliver sample to M-545. After 1630 deliver to clinical laboratory processing, 5th floor Moffitt.
Collect: Sputum cup, Lukens trap
Sample Type: Sputum, Bronchialveolar lavage (BAL), Bronchial wash
Specimen Preparation: If received on a Microbiology requisition forward it and sample to M-545.
Synonyms: PCP, Pneumocystis carinii pneumonia
POCT ACT Plus/LR
ACTP, ACTLR

ORDERING

Performing Lab:
POCT

Methodology:
Hemochron

Additional Information:
Tests performed by qualified and accredited RNs, MDs, and CLSs

Synonyms:
- ACTP
- ACTLR
- Hemochron ACT

COLLECTION

Sample Type:
Whole blood

Collect:
Syringe

Amount to Collect:
0.05 mL

Preferred Volume:
0.05 mL

Minimum Volume:
0.05 mL

Stability (from collection to initiation):
30 seconds

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
clotted samples, samples exceeding stability period

PROCESSING

Test Code:
ACTP
ACTLR

Performing Lab:
POCT

Preferred Volume:
0.05 mL

Minimum Volume:
0.05 mL

Unacceptable Conditions:
clotted samples, samples exceeding stability period

Stability (from collection to initiation):
30 seconds

Storage/Transport Temperature:
Room temperature
RESULT INTERPRETATION

Units:
Seconds

Additional Information:
Tests performed by qualified and accredited RNs, MDs, and CLSs

ADMINISTRATIVE

LOINC Codes:
3184-9

COMPLETE VIEW

Test Code:
ACTP
ACTLR

Performing Lab:
POCT

Methodology:
Hemochron

Collect:
Syringe

Amount to Collect:
0.05 mL

Sample Type:
Whole blood

Preferred Volume:
0.05 mL

Minimum Volume:
0.05 mL

Unacceptable Conditions:
clotted samples, samples exceeding stability period

Units:
Seconds

Synonyms:
• ACTP
• ACTLR
• Hemochron ACT

Storage/Transport Temperature:
Room temperature

Stability (from collection to initiation):
30 seconds

Additional Information:
Tests performed by qualified and accredited RNs, MDs, and CLSs

LOINC Codes:
3184-9
POCT Activated Clotting Time

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Methodology:
Hemochron Response: Clotting activation & optical clot detection
Additional Information:
ACT testing is performed in the operating rooms, Interventional radiology and Cardiac catheterization areas and on selected patient floors. It is not performed or offered by the UCSF Clinical Laboratories.

The HEMOCHRON Response ACT test is intended for monitoring patients receiving heparin anticoagulation therapy. Two ranges of therapeutic heparinization may be monitored by using either the low range (LR) or high range (Plus) cartridges respectively:

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Heparin level</th>
<th>Reportable range</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR</td>
<td>up to 2.5 U/mL</td>
<td>65-400 sec</td>
</tr>
<tr>
<td>Plus(+)</td>
<td>1.0-6.0 U/mL</td>
<td>67-1005 sec</td>
</tr>
</tbody>
</table>

Note: Although the reportable ranges overlap, due to the use of different clotting activators in the LR (celite) and Plus (kaolin) cartridges the ACT values derived from these two cartridges are NOT comparable.

ACT is affected by poor sample collection technique. When the sample is collected by venipuncture, use a two syringe technique to prevent tissue thromboplastin contamination. Care must be taken to adequately flush fluids from indwelling lines or catheters with patient blood before collection. Poor collection technique affects precision and accuracy. The following sample problems may effect results:
1. presence of bubbles or foaming
2. Hemolysis
3. Clotted or partially clotted sample

The following clinical conditions may affect the ACT result: hemodilution, cardioplegic solutions, hypothermia, platelet dysfunction, hypofibrinogenemia and other coagulopathies, and unsuspected heparin or warfarin therapy.

Samples with Hematocrits < 20% or > 55% may have optical densities outside of the operating range of the instrument and may results in 'Sample not seen' error message

Patients with Antiphospholipid Syndrome (APL) may have antibodies that interact with the ACT and cause spurious results. Although not extensively studied with the Hemochron Elite system, patients with this syndrome who require heparin anticoagulation should not be monitored with the ACT and an alternate method should be used.

Synonyms:
- ACT
- Activated coagulation time
- CT

COLLECTION

Sample Type:
Whole blood
Collect:
Special cartridge specific for the level of heparinization used (See Additional information)
Amount to Collect:
200 µL (0.2 mL)
Preferred Volume:
50 µL (0.05 mL)
Minimum Volume:
15 µL (0.015 mL)

**Remarks:**
Samples should be tested as soon as possible after collection.

**PROCESSING**

**Performing Lab:**
Authorized Point of Care testing site staff

**Preferred Volume:**
50 µL (0.05 mL)

**Minimum Volume:**
15 µL (0.015 mL)

**RESULT INTERPRETATION**

**Units:**
seconds

**Reference Interval:**
Testing is used to monitor anticoagulation during invasive procedures. ACT levels during anticoagulation are compared to patient baseline values.

<table>
<thead>
<tr>
<th>Cartridge</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR cartridge</td>
<td>99-187 sec</td>
</tr>
<tr>
<td>Plus (+) cartridge</td>
<td>98-139 sec</td>
</tr>
</tbody>
</table>

See Additional Information for reportable ranges and heparin ranges appropriate for each cartridge.

**Additional Information:**
ACT testing is performed in the operating rooms, Interventional radiology and Cardiac catheterization areas and on selected patient floors. It is not performed or offered by the UCSF Clinical Laboratories.

The HEMOCHRON Response ACT test is intended for monitoring patients receiving heparin anticoagulation therapy. Two ranges of therapeutic heparinization may be monitored by using either the low range (LR) or high range (Plus) cartridges respectively:

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ACT is affected by poor sample collection technique. When the sample is collected by venipuncture, use a two syringe technique to prevent tissue thromboplastin contamination. Care must be taken to adequately flush fluids from indwelling lines or catheters with patient blood before collection. Poor collection technique affects precision and accuracy. The following sample problems may effect results:
1. presence of bubbles or foaming
2. Hemolysis
3. Clotted or partially clotted sample

The following clinical conditions may affect the ACT result: hemodilution, cardioplegic solutions, hypothermia, platelet dysfunction, hypofibrinogenemia and other coagulopathies, and unsuspected heparin or warfarin therapy.

Samples with Hematocrits < 20% or > 55% may have optical densities outside of the operating range of the instrument and may results in ‘Sample not seen’ error message

Patients with Antiphospholipid Syndrome (APL) may have antibodies that interact with the ACT and cause spurious results. Although not extensively studied with the Hemochron Elite system, patients with this syndrome who require heparin anticoagulation should not be monitored with the ACT and an alternate method should be used.
Available Stat: Yes
Performing Lab: Authorized Point of Care testing site staff
Methodology: Hemochron Response: Clotting activation & optical clot detection
Remarks: Samples should be tested as soon as possible after collection.
Collect: Special cartridge specific for the level of heparinization used (See Additional information)
Amount to Collect: 200 µL (0.2 mL)
Sample Type: Whole blood
Preferred Volume: 50 µL (0.05 mL)
Minimum Volume: 15 µL (0.015 mL)
Units: seconds
Reference Interval: Testing is used to monitor anticoagulation during invasive procedures. ACT levels during anticoagulation are compared to patient baseline values.

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<th>Cartridge</th>
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See Additional Information for reportable ranges and heparin ranges appropriate for each cartridge.

Synonyms:
- ACT
- Activated coagulation time
- CT

Additional Information:
ACT testing is performed in the operating rooms, Interventional radiology and Cardiac catheterization areas and on selected patient floors. It is not performed or offered by the UCSF Clinical Laboratories.

The HEMOCHRON Response ACT test is intended for monitoring patients receiving heparin anticoagulation therapy. Two ranges of therapeutic heparinization may be monitored by using either the low range (LR) or high range (Plus) cartridges respectively:

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The following clinical conditions may affect the ACT result: hemodilution, cardioplegic solutions, hypothermia, platelet dysfunction, hypofibrinogenemia and other coagulopathies, and unsuspected heparin or warfarin therapy.

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in 'Sample not seen' error message

Patients with Antiphospholipid Syndrome (APL) may have antibodies that interact with the ACT and cause spurious results. Although not extensively studied with the Hemochron Elite system, patients with this syndrome who require heparin anticoagulation should not be monitored with the ACT and an alternate method should be used.
POCT Blood Gases & Electrolytes
EG7P

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Performed:
Test is only available to Neonatal Transport staff and Code Blue team
Methodology:
iStat EG7+ cartridge

COLLECTION

Sample Type:
Heparinized capillary whole blood, Arterial blood gas sample
Amount to Collect:
0.1 mL for capillary sample, 0.2 mL if collected in ABG syringe
Preferred Volume:
0.1 mL
Minimum Volume:
0.1 mL
Stability (from collection to initiation):
Sample should be tested immediately after collection.

PROCESSING

Test Code:
EG7P
Performing Lab:
Authorized Point of Care testing site staff
Preferred Volume:
0.1 mL
Minimum Volume:
0.1 mL
Stability (from collection to initiation):
Sample should be tested immediately after collection.

RESULT INTERPRETATION

Units:
See normal range info
Reference Interval:

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Ages</th>
<th>Arterial</th>
<th>Venous</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>All</td>
<td>7.35-7.45</td>
<td>7.31-7.41</td>
</tr>
<tr>
<td>pCO2</td>
<td>&lt;1 year</td>
<td>27-41 mmHg</td>
<td>41-51 mmHg</td>
</tr>
<tr>
<td></td>
<td>&gt;= 1 year</td>
<td>32-48 mmHg</td>
<td>41-51 mmHg</td>
</tr>
<tr>
<td>pO2</td>
<td>&lt;30 days</td>
<td>80-100 mmHg</td>
<td>35-40 mmHg</td>
</tr>
<tr>
<td></td>
<td>&gt;= 30 days</td>
<td>83-108 mmHg</td>
<td>35-40 mmHg</td>
</tr>
<tr>
<td>Na+</td>
<td>All</td>
<td>136-146 mmol/L</td>
<td>136-146 mmol/L</td>
</tr>
<tr>
<td>K+</td>
<td>&lt;= 1 year</td>
<td>3.0-5.4 mmol/L</td>
<td>3.0-5.4 mmol/L</td>
</tr>
<tr>
<td></td>
<td>&gt;1 year</td>
<td>3.4-4.5 mmol/L</td>
<td>3.4-4.5 mmol/L</td>
</tr>
</tbody>
</table>
Critical Values:

Arterial:
- pH: <7.20 or > 7.55
- pCO2: <25 mmHg or > 65 mmHg
- Neonatal pO2: <40 mmHg or > 100 mmHg
- Adult pO2: <40 mmHg

Venous:
- pH: <7.20
- Venous pCO2: >75 mmHg

Na+: <125 mmol/L or > 155 mmol/L
K+: <3.0 mmol/L or > 6.0 mmol/L
iCa++: <0.80 mmol/L or > 1.55 mmol/L

ADMINISTRATIVE

CPT Codes:
- 82803, 84295, 84132, 82330

COMPLETE VIEW

Available Stat:
- Yes

Test Code:
- EG7P

Performing Lab:
- Authorized Point of Care testing site staff

Performed:
- Test is only available to Neonatal Transport staff and Code Blue team

Methodology:
- iStat EG7+ cartridge

Amount to Collect:
- 0.1 mL for capillary sample, 0.2 mL if collected in ABG syringe

Sample Type:
- Heparinized capillary whole blood, Arterial blood gas sample

Preferred Volume:
- 0.1 mL

Minimum Volume:
- 0.1 mL

Units:
- See normal range info

Reference Interval:

<table>
<thead>
<tr>
<th>Analyte</th>
<th>Ages</th>
<th>Arterial</th>
<th>Venous</th>
</tr>
</thead>
<tbody>
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<td>pH</td>
<td>All</td>
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</tr>
<tr>
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<td>&lt;1 year</td>
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<td>pO2</td>
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</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Na+</td>
<td>All</td>
<td>136-146 mmol/L</td>
<td>136-146 mmol/L</td>
</tr>
<tr>
<td>K+</td>
<td>&lt;= 1 year</td>
<td>3.0-5.4 mmol/L</td>
<td>3.0-5.4 mmol/L</td>
</tr>
</tbody>
</table>
>1 year  3.4-4.5 mmol/L  3.4-4.5 mmol/L
iCa++  <6 mo.  0.95-1.50 mmol/L  0.95-1.50 mmol/L
       >= 6 mo.  1.15-1.29 mmol/L  1.15-1.29 mmol/L
HCO3-  All       22-27 mmol/L
Base Excess All       -2 to +2
O2 Sat.  All       95-99%

Critical Values:
Arterial:
   pH       <7.20 or > 7.55
   pCO2     <25 mmHg or > 65 mmHg
Neonatal pO2 <40 mmHg or > 100 mmHg
Adult pO2  <40 mmHg

Venous:
   pH       <7.20
Venous pCO2 >75 mmHg

Na+  <125 mmol/L or > 155 mmol/L
K+  <3.0 mmol/L or > 6.0 mmol/L
iCa++  <0.80 mmol/L or > 1.55 mmol/L

Stability (from collection to initiation):
Sample should be tested immediately after collection.

CPT Codes:
82803, 84295, 84132, 82330
**POCT Coloscreen**

### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Authorized Point of Care testing site staff</td>
</tr>
<tr>
<td><strong>Performed:</strong></td>
<td>Test available 24 hours per day 7 days per week</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>Guiac</td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
<td>Results obtained with Coloscreen cannot be considered conclusive evidence of the presence or absence of gastrointestinal bleeding or pathology. Both false negative and false positive tests may occur. Coloscreen is designed as a preliminary screen and is not intended to replace other diagnostic procedures used to identify gastrointestinal pathology (endoscopy, x-ray studies). Coloscreen will only detect hemoglobin that has been released from red cells. Intact red cells do not react with this test.</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>- Fecal occult blood</td>
</tr>
</tbody>
</table>

### COLLECTION

| **Patient Preparation:** | Ingestion of red meat, horseradish, cantaloupe, raw turnips, cauliflower, broccoli, red radishes, and parsnip may produce false positive test results. Vitamin C, Aspirin or other NSAIDS should be avoided 7 days prior to testing. |
| **Sample Type:** | Stool |
| **Amount to Collect:** | Small amount (smear) from rectal examination or stool sample |

### PROCESSING

| **Performing Lab:** | Authorized Point of Care testing site staff |

### RESULT INTERPRETATION

| **Reference Interval:** | Negative |
| **Additional Information:** | Results obtained with Coloscreen cannot be considered conclusive evidence of the presence or absence of gastrointestinal bleeding or pathology. Both false negative and false positive tests may occur. Coloscreen is designed as a preliminary screen and is not intended to replace other diagnostic procedures used to identify gastrointestinal pathology (endoscopy, x-ray studies). Coloscreen will only detect hemoglobin that has been released from red cells. Intact red cells do not react with this test. |

### COMPLETE VIEW

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<tr>
<th>Available Stat:</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Authorized Point of Care testing site staff</td>
</tr>
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<td><strong>Performed:</strong></td>
<td>Test available 24 hours per day 7 days per week</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td></td>
</tr>
</tbody>
</table>
Guiac

**Patient Preparation:**
Ingestion of red meat, horseradish, cantaloupe, raw turnips, cauliflower, broccoli, red radishes, and parsnip may produce false positive test results. Vitamin C, Aspirin or other NSAIDS should be avoided 7 days prior to testing.

**Amount to Collect:**
Small amount (smear) from rectal examination or stool sample

**Sample Type:**
Stool

**Reference Interval:**
Negative

**Synonyms:**
- Fecal occult blood

**Additional Information:**
Results obtained with Coloscreen cannot be considered conclusive evidence of the presence or absence of gastrointestinal bleeding or pathology. Both false negative and false positive tests may occur. Coloscreen is designed as a preliminary screen and is not intended to replace other diagnostic procedures used to identify gastrointestinal pathology (endoscopy, x-ray studies). Coloscreen will only detect hemoglobin that has been released from red cells. Intact red cells do not react with this test.
POCT Creatinine with eGFR
CREG

ORDERING

Available Stat:
Yes

Performing Lab:
Authorized Point of Care testing site staff

Methodology:
Enzymatic amperometric (iStat)

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 88.4. See method details for assay limitations and drug interferences.

Measurements of whole blood creatinine with this point of care assay are approximately 0.2 mg/dL higher than measurements of plasma creatinine with the Beckman Synchron assay used in the central laboratory. Although the manufacturer of the point of care assay claims standardization traceable to the isotope dilution mass spectrometry (IDMS) reference method, this point of care assay shows a systematic positive bias versus the IDMS traceable method used in the central laboratory (similar to the systematic bias observed with non-IDMS traceable creatinine assays). To minimize the impact of this positive bias on eGFR measurements, calculations of eGFR using the whole blood point of care creatinine results are performed using the MDRD study equation for non-IDMS traceable creatinine methods.

\[
\text{GFR (mL/min/1.73 m}^2\text{)} = 186 \times (S_{cr})^{-1.154} \times \text{(Age)}^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if African-American})
\]

The normal range for serum creatinine in adults was verified using donor samples collected from our Donor Center (excludes autologous donors). We adopted the manufacturer's adult reference range of 0.6 to 1.3 mg/dL.

Because the MDRD formula is not considered sufficiently accurate for estimating GFR in patients with normal or mildly reduced renal function, results greater than 60 mL/min/1.73 meters squared body surface area are displayed as > 60 mL/min and are not reported as an exact number. Note that the estimated GFR result is not reliable in certain groups including severely ill patients. The MDRD equation used to estimate GFR has been validated only in Caucasian and African Americans 18 - 70 years of age. The equation has not been validated in other population groups, pregnant women, transplant recipients, medically unstable patients including those with acute renal failure, or in persons with extremes of body size, muscle mass, or nutritional status. Application of the MDRD calculation in these cases may lead to errors in GFR estimation. [Click here for more information on this topic]

GFR can also be estimated from serum creatinine in adults by the older formula of Cockcroft DW, Gault MH: (Nephron 1976;16:31):

\[
(140 - \text{age [years]}) \times \text{wt [kg]})/ (72 \times \text{creatinine [mg/dL]})
\]

For women, multiply the calculated result by 0.85

Note that the Cockcroft-Gault formula is susceptible to many of the same limitations of the MDRD formula and may overestimate GFR by 16% or more when using current methods of creatinine measurement.

According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation

[Click here for on line calculator based on Schwartz Formula]

Bedside IDMS-traceable Schwartz Equation for Children

\[
\text{GFR (mL/min/1.73 m}^2\text{)} = (0.41 \times \text{Height in cm})/ \text{Creatinine in mg/dL)}
\]

\[
(140 - \text{age [years]}) \times \text{wt [kg]})/ (72 \times \text{creatinine [mg/dL]})
\]
For women, multiply the calculated result by 0.85. Note that the Cockcroft-Gault formula is susceptible to many of the same limitations of the MDRD formula and may overestimate GFR by 16% or more when using current methods of creatinine measurement. According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation Click here for on line calculator based on Schwartz Formula Bedside IDMS-traceable Schwartz Equation for Children GFR (mL/min/1.73 m²) = (0.41 x Height in cm) / Creatinine in mg/dL.

**COLLECTION**

**Sample Type:**
- Heparinized whole blood

**Collect:**
- Light green top

**Amount to Collect:**
- 1 mL blood

**Preferred Volume:**
- 1 mL blood

**Minimum Volume:**
- 1 mL blood

**Stability (from collection to initiation):**
- Room temperature 30 minutes

**PROCESSING**

**Test Code:**
- CREG

**Test Group:**
- Creatinine

**Performing Lab:**
- Authorized Point of Care testing site staff

**Preferred Volume:**
- 1 mL blood

**Minimum Volume:**
- 1 mL blood

**Stability (from collection to initiation):**
- Room temperature 30 minutes

**RESULT INTERPRETATION**

**Units:**
- mg/dL

Note: The eGFR is calculated by nursing staff using an on-line calculator from the National Kidney Foundation based on the CKD-EPI (2009) equation Click here for calculator

**Reference Interval:**

<table>
<thead>
<tr>
<th>Creatinine</th>
<th>Male &amp; Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&gt;= 19 years</td>
<td>0.6-1.3 mg/dL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>eGFR</th>
<th>Male &amp; Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;18 years</td>
<td>&gt;60 mL/min/1.73 m²</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>&gt;60 mL/min/1.73 m²</td>
</tr>
</tbody>
</table>
Additional Information:

To convert mg/dL to µmol/L (SI units) multiply by 88.4. See method details for assay limitations and drug interferences.

Measurements of whole blood creatinine with this point of care assay are approximately 0.2 mg/dL higher than measurements of plasma creatinine with the Beckman Synchrom assay used in the central laboratory. Although the manufacturer of the point of care assay claims standardization traceable to the isotope dilution mass spectrometry (IDMS) reference method, this point of care assay shows a systematic positive bias versus the IDMS traceable method used in the central laboratory (similar to the systematic bias observed with non-IDMS traceable creatinine assays). To minimize the impact of this positive bias on eGFR measurements, calculations of eGFR using the whole blood point of care creatinine results are performed using the MDRD study equation for non-IDMS traceable creatinine methods.

\[
\text{GFR (mL/min/1.73 m}^2) = 186 \times (S_{cr}^{-1.154} \times (\text{Age})^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if African-American})
\]

The normal range for serum creatinine in adults was verified using donor samples collected from our Donor Center (excludes autologous donors). We adopted the manufacturer's adult reference range of 0.6 to 1.3 mg/dL.

Because the MDRD formula is not considered sufficiently accurate for estimating GFR in patients with normal or mildly reduced renal function, results greater than 60 mL/min/1.73 meters squared body surface area are displayed as > 60 mL/min and are not reported as an exact number. Note that the estimated GFR result is not reliable in certain groups including severely ill patients. The MDRD equation used to estimate GFR has been validated only in Caucasian and African Americans 18 - 70 years of age. The equation has not been validated in other population groups, pregnant women, transplant recipients, medically unstable patients including those with acute renal failure, or in persons with extremes of body size, muscle mass, or nutritional status. Application of the MDRD calculation in these cases may lead to errors in GFR estimation. Click here for more information on this topic.

GFR can also be estimated from serum creatinine in adults by the older formula of Cockcroft DW, Gault MH: (Nephron 1976;16:31):

\[
(\frac{(140 - \text{age [years]}) \times \text{[wt [kg]]}}{(72 \times \text{creatinine [mg/dL]})})
\]

For women, multiply the calculated result by 0.85

Note that the Cockcroft-Gault formula is susceptible to many of the same limitations of the MDRD formula and may overestimate GFR by 16% or more when using current methods of creatinine measurement.

According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation.

Click here for on line calculator based on Schwartz Formula

Bedside IDMS-traceable Schwartz Equation for Children

\[
\text{GFR (mL/min/1.73 m}^2 = (0.41 \times \text{Height in cm}) / \text{Creatinine in mg/dL})
\]

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(\frac{(140 - \text{age [years]}) \times \text{[wt [kg]]}}{(72 \times \text{creatinine [mg/dL]})})
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CPT Codes:
82565

LOINC Codes:
Available Stat:  Yes
Test Code:  CREG
Test Group:  Creatinine
Performing Lab:  Authorized Point of Care testing site staff
Methodology:  Enzymatic amperometric (iStat)
Collect:  Light green top
Amount to Collect:  1 mL blood
Sample Type:  Heparinized whole blood
Preferred Volume:  1 mL blood
Minimum Volume:  1 mL blood
Units:  mg/dL

Note: The eGFR is calculated by nursing staff using an on-line calculator from the National Kidney Foundation based on the CKD-EPI (2009) equation

Reference Interval:
Creatinine
Age  Male & Female
>= 19 years  0.6-1.3 mg/dL

eGFR
Age  Male & Female
<18 years  >60 mL/min/1.73 m²
>= 18 years  >60 mL/min/1.73 m²

Stability (from collection to initiation):
Room temperature 30 minutes

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 88.4. See method details for assay limitations and drug interferences.

Measurements of whole blood creatinine with this point of care assay are are approximately 0.2 mg/dL higher than measurements of plasma creatinine with the Beckman Synchron assay used in the central laboratory. Although the manufacturer of the point of care assay claims standardization traceable to the isotope dilution mass spectrometry (IDMS) reference method, this point of care assay shows a systematic positive bias versus the IDMS traceable method used in the central laboratory (similar to the systematic bias observed with non-IDMS traceable creatinine assays). To minimize the impact of this positive bias on eGFR measurements, calculations of eGFR using the whole blood point of care creatinine results are performed using the MDRD study equation for non-IDMS traceable creatinine methods.

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\text{GFR (mL/min/1.73 m}^2\text{)} = 186 \times (S_{\text{cr}})^{-1.154} \times (\text{Age})^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if African-American})
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The normal range for serum creatinine in adults was verified using donor samples collected from our Donor Center (excludes autologous donors). We adopted the manufacturer's adult reference range of 0.6 to 1.3 mg/dL.
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\text{GFR} \ [\text{mL/min}] = \frac{(140 - \text{age} \ [\text{years}]) \times \text{wt} \ [\text{kg}]}{(72 \times \text{creatinine \ [mg/dL]})}
\]

For women, multiply the calculated result by 0.85

Note that the Cockcroft-Gault formula is susceptible to many of the same limitations of the MDRD formula and may overestimate GFR by 16% or more when using current methods of creatinine measurement.

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Bedside IDMS-traceable Schwartz Equation for Children

\[
\text{GFR} \ [\text{mL/min} \times 1.73 \text{ m}^2] = \frac{(140 - \text{age} \ [\text{years}]) \times \text{wt} \ [\text{kg}]}{(72 \times \text{creatinine \ [mg/dL]})}
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For women, multiply the calculated result by 0.85 Note that the Cockcroft-Gault formula is susceptible to many of the same limitations of the MDRD formula and may overestimate GFR by 16% or more when using current methods of creatinine measurement. According to the National Kidney Disease Education Program, the best equation for estimating glomerular filtration rate (GFR) from serum creatinine in children is the Bedside Isotope Dilution Mass Spectrometry (IDMS)-traceable Schwartz equation Click here for on line calculator based on Schwartz Formula

Bedside IDMS-traceable Schwartz Equation for Children

GFR (mL/min/1.73 m^2) = (0.41 x Height in cm) / Creatinine in mg/dL

\[
\text{CPT Codes:}
82565
\]

\[
\text{LOINC Codes:}
38483-4
\]
POCT Gastric Occult Blood

ORDERING

Available Stat:  
Yes
Performing Lab:  
Authorized Point of Care testing site staff
Performed:  
Test available 24 hours per day 7 days per week
Methodology:  
Guiac
Additional Information:  
Foods with peroxidase activity (raw or undercooked meat, raw fruits and vegetables) may cause false positive reactions. Vitamin C or antacids may cause false negative results.

As with any occult blood test, the results of Gastroccult test cannot be considered conclusive evidence of the presence of upper gastrointestinal bleeding or pathology.

Gastroccult tests are designed as an aid to diagnosis, and are not intended to replace other diagnostic procedures such as X-ray studies or Endoscopy. Gastroccult test results should only be used in conjunction with other information relevant to the clinical status of the patient. A positive test result may suggest the need for more careful monitoring of the patient.

Although a pH monitor is included on the gastroccult slide it cannot be used to determine the pH of the sample. This portion of the test is not Quality controlled nor validated at UCSF. If pH testing is required use pH paper according to the pH testing procedure.

Synonyms:  
- Occult blood
- gastric bleeding

COLLECTION

Sample Type:  
Gastric aspirate or vomitus
Amount to Collect:  
One drop
Remarks:  
Samples should be tested immediately after collection

PROCESSING

Performing Lab:  
Authorized Point of Care testing site staff

RESULT INTERPRETATION

Reference Interval:  
Negative
Additional Information:  
Foods with peroxidase activity (raw or undercooked meat, raw fruits and vegetables) may cause false positive reactions. Vitamin C or antacids may cause false negative results.

As with any occult blood test, the results of Gastroccult test cannot be considered conclusive evidence of the presence of upper gastrointestinal bleeding or pathology.

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Although a pH monitor is included on the gastroccult slide it cannot be used to determine the pH of the sample. This portion of the test is not Quality controlled nor validated at UCSF. If pH testing is required use pH paper according to the pH testing procedure.

**COMPLETE VIEW**

**Available Stat:**
Yes

**Performing Lab:**
Authorized Point of Care testing site staff

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Guiacl

**Remarks:**
Samples should be tested immediately after collection

**Amount to Collect:**
One drop

**Sample Type:**
Gastric aspirate or vomitus

**Reference Interval:**
Negative

**Synonyms:**
- Occult blood
- gastric bleeding

**Additional Information:**
Foods with peroxidase activity (raw or undercooked meat, raw fruits and vegetables) may cause false positive reactions. Vitamin C or antacids may cause false negative results.

As with any occult blood test, the results of Gastroccult! test cannot be considered conclusive evidence of the presence of upper gastrointestinal bleeding or pathology.

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Although a pH monitor is included on the gastroccult slide it cannot be used to determine the pH of the sample. This portion of the test is not Quality controlled nor validated at UCSF. If pH testing is required use pH paper according to the pH testing procedure.
POCT Glucose, Fingerstick
GLUPOC

ORDERING

Available Stat:  
Yes  
Performing Lab:  
Authorized Point of Care testing site staff  
Performed:  
Test available 24 hours per day 7 days per week  
Methodology:  
Roche AccuCheck Inform II glucometer  
Additional Information:  
This test is subject to several interferences that can significantly impact the glucose result. Please see below.

Hematocrit: A Hct of < 20% may yield spuriously high glucose results. Conversely if the hematocrit is > 55%, the glucose test results may be spuriously low. Blood samples for patient's with hematocrit levels < 20% or > 55% should be sent to the lab for glucose testing.

Other Sugars: Patients on parenteral treatments containing Maltose (see information on Hepagam below) or Galactose or patients receiving oral Xylose should not be tested using the Accu-Chek Inform meter. The test is sensitive to these sugars and may result in a falsely elevated glucose reading. Blood samples for these patients should be sent to the lab for glucose testing during the administration of such products and for 24 hours after they are discontinued. Note that these sugars may be used as stabilizing agents for some pharmaceuticals (e.g. IVIG) and therefore it may not be readily apparent that a patient is at risk for this interference. Contact Pharmacy for any questions about drugs that may contain these sugars.

Note: An evaluation of patients at UCSF receiving Hepagam (contains maltose) demonstrated that the magnitude of the interference was not as significant as anticipated. It is acceptable to perform POCT blood glucose in these patients. However, a confirmatory test should be sent to the clinical laboratory for fingerstick glucose values that are > 250 mg/dL prior to adjusting insulin.

Bilirubin: Unconjugated bilirubin levels > 20 mg/dL may produce elevated POCT glucose values. An evaluation of this at UCSF demonstrated the effect to be variable and relatively small. It is acceptable to perform POCT blood glucose in these patients. However, a confirmatory test should be sent to the clinical laboratory for fingerstick glucose values that are > 250 mg/dL prior to adjusting insulin.

Lipemia: Lipemia at levels > 5000 mg/dL while uncommon may result in elevated glucose results with this method. Samples in these patients should be sent to the clinical laboratory for analysis.

Acetaminophen: Acetaminophen administration in normal doses does not cause an interference. However, at levels > 8 mg/dL (80 mg/L; normal therapeutic range for Acetaminophen = 10-20 mg/L) acetaminophen may result in elevated glucose levels by this method. In overdose situations samples should be sent to the clinical laboratory for testing.

Uric acid: Increased uric acid may result in elevated glucose results with this method. The level of uric acid that may result in an interference is dependent on the actual glucose level:

- Glucose range  
  - Hypoglycemic range  
  - Normoglycemic range  
  - Hyperglycemic range
- Uric acid level that may interfere  
  - >10 mg/dL  
  - >12 mg/dL  
  - >16 mg/dL

Decreased blood flow: In situations of decreased blood flow, fingerstick blood testing may not be appropriate, since it may not reflect the true physiological state. Examples would include, but are not limited to severe dehydration caused by diabetic ketoacidosis or the hyperglycemic hyperosmolar nonketotic state, hypotension, shock, or peripheral vascular disease.

Synonyms:  
- Point of care  
- POCT  
- glucometer

COLLECTION

Printed 06/07/19  
Test information subject to change
Sample Type:
Capillary blood (fingerstick)

Amount to Collect:
One drop

PROCESSING

Test Code:
GLUPOC

Test Group:
Glucose

Performing Lab:
Authorized Point of Care testing site staff

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
Neonate: 55-115 mg/dL
Adult & Pediatric: 70-199 mg/dL

Critical Values:
Neonate: < 40 mg/dL or > 150 mg/dL
Adult & Pediatric: < 60 mg/dL or > 400 mg/dL

Additional Information:
This test is subject to several interferences that can significantly impact the glucose result. Please see below.

Hematocrit: A Hct of < 20% may yield spuriously high glucose results. Conversely if the hematocrit is > 55%, the glucose test results may be spuriously low. Blood samples for patient's with hematocrit levels < 20% or > 55% should be sent to the lab for glucose testing.

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<table>
<thead>
<tr>
<th>Glucose range</th>
<th>Uric acid level that may interfere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoglycemic range</td>
<td>&gt;10 mg/dL</td>
</tr>
<tr>
<td>Normoglycemic range</td>
<td>&gt;12 mg/dL</td>
</tr>
<tr>
<td>Hyperglycemic range</td>
<td>&gt;16 mg/dL</td>
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</tbody>
</table>
Decreased blood flow: In situations of decreased blood flow, fingerstick blood testing may not be appropriate, since it may not reflect the true physiological state. Examples would include, but are not limited to severe dehydration caused by diabetic ketoacidosis or the hyperglycemic hyperosmolar nonketotic state, hypotension, shock, or peripheral vascular disease.

**ADMINISTRATIVE**

**CPT Codes:**
- 82962

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- GLUPOC

**Test Group:**
- Glucose

**Performing Lab:**
- Authorized Point of Care testing site staff

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Roche Accucheck Inform II glucometer

**Amount to Collect:**
- One drop

**Sample Type:**
- Capillary blood (fingerstick)

**Units:**
- mg/dL

**Reference Interval:**
- Neonate: 55-115 mg/dL
- Adult & Pediatric: 70-199 mg/dL

See Additional information for information on interferences with POCT glucose determinations

**Critical Values:**
- Neonate: < 40 mg/dL or > 150 mg/dL
- Adult & Pediatric: < 60 mg/dL or > 400 mg/dL

**Synonyms:**
- Point of care
- POCT
- glucometer

**Additional Information:**

This test is subject to several interferences that can significantly impact the glucose result. Please see below.

Hematocrit: A Hct of < 20% may yield spuriously high glucose results. Conversely if the hematocrit is > 55%, the glucose test results may be spuriously low. Blood samples for patient's with hematocrit levels < 20% or > 55% should be sent to the lab for glucose testing.

Other Sugars: Patients on parenteral treatments containing Maltose (see information on Hepagam below) or Galactose or patients receiving oral Xylose should not be tested using the Accu-Chek Inform meter. The test is sensitive to these sugars and may result in a falsely elevated glucose reading. Blood samples for these patients should be sent to the lab for glucose testing during the administration of such products and for 24 hours after they are discontinued. Note that these sugars may be used as stabilizing agents for some pharmaceuticals (e.g. IVIG) and therefore it may not be readily apparent that a patient is at risk for this interference. Contact Pharmacy for any questions about drugs that may contain these sugars.

Note: An evaluation of patients at UCSF receiving Hepagam (contains maltose) demonstrated that the magnitude of the interference
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</table>

Decreased blood flow: In situations of decreased blood flow, fingerstick blood testing may not be appropriate, since it may not reflect the true physiological state. Examples would include, but are not limited to severe dehydration caused by diabetic ketoacidosis or the hyperglycemic hyperosmolar nonketotic state, hypotension, shock, or peripheral vascular disease.

CPT Codes:

82962
# POCT Hemoglobin

**HEMPC1, HEMPOC**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Authorized Point of Care testing site staff</td>
</tr>
<tr>
<td><strong>Performed:</strong></td>
<td>24 hours per day, 7 days per week</td>
</tr>
<tr>
<td><strong>Methodology:</strong></td>
<td>Optical detection of azidemethemoglobin production (Hemocue)</td>
</tr>
<tr>
<td><strong>Additional Information:</strong></td>
<td>Air bubbles in the microcuvette will result in erroneously low values. The microcuvette should be inspected for bubbles before testing. The microcuvette should be filled in a continuous process. It should never be topped off after the initial filling. Blood inside the HemoCue Classic will interfere with hemoglobin measurement. Blood collected in vacutainer tubes with liquid anticoagulant may give erroneous readings due to the effects of dilution.</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>HEMPC1, HEMPOC, Hemocue</td>
</tr>
</tbody>
</table>

## COLLECTION

| **Sample Type:** | Fingerstick, EDTA or Heparinized whole blood |
| **Collect:** | Hemocue cuvette |
| **Amount to Collect:** | Fingerstick: 0.01 mL blood (10 µL)  
                         Vacutainer sample: 1 mL blood |
| **Minimum Volume:** | Fingerstick: 0.01 mL blood (10 µL)  
                         Vacutainer sample: 1 mL blood |
| **Remarks:** | Fingerstick sample:  
                         1. Wipe away the first drop of blood.  
                         2. Apply light pressure to the finger until a drop of blood forms. Do not squeeze the finger.  
                         3. Hold the microcuvette by the wings with the pointed end away from you.  
                         4. Touch the pointed tip of the microcuvette to the drop of blood.  
                         5. Allow the microcuvette to fill by capillary action |

## PROCESSING

| **Test Code:** | HEMPC1 (Test code)  
                 HEMPOC (Battery) |
| **Performing Lab:** | Authorized Point of Care testing site staff |
| **Minimum Volume:** |  

RESULT INTERPRETATION

Units:
g/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval (g/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>14.5-22.5</td>
</tr>
<tr>
<td>8-14 days</td>
<td>13.5-21.5</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>12.5-20.5</td>
</tr>
<tr>
<td>1-2 months</td>
<td>10.0-18.0</td>
</tr>
<tr>
<td>2-3 months</td>
<td>9.0-14.0</td>
</tr>
<tr>
<td>3-6 months</td>
<td>9.5-13.5</td>
</tr>
<tr>
<td>6-24 months</td>
<td>11.0-13.5</td>
</tr>
<tr>
<td>2-5 years</td>
<td>11.2-13.5</td>
</tr>
<tr>
<td>5-8 years</td>
<td>11.4-15.5</td>
</tr>
<tr>
<td>8-12 years</td>
<td>11.6-15.5</td>
</tr>
</tbody>
</table>

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<tr>
<th>Age</th>
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<tbody>
<tr>
<td>12-15 years</td>
<td>12.3-16.0</td>
</tr>
<tr>
<td>15-18 years</td>
<td>12.6-17.0</td>
</tr>
<tr>
<td>18+ years</td>
<td>13.6-17.5</td>
</tr>
</tbody>
</table>

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<tr>
<th>Age</th>
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</tr>
</thead>
<tbody>
<tr>
<td>12-15 years</td>
<td>11.8-15.5</td>
</tr>
<tr>
<td>15+ years</td>
<td>12.0-15.5</td>
</tr>
</tbody>
</table>

Critical Values:
<= 7 g/dL

Additional Information:
Air bubbles in the microcuvette will result in erroneously low values. The microcuvette should be inspected for bubbles before testing.

The microcuvette should be filled in a continuous process. It should never be topped off after the initial filling.

Blood inside the HemoCue Classic will interfere with hemoglobin measurement.

Blood collected in vacutainer tubes with liquid anticoagulant may give erroneous readings due to the effects of dilution.

Interpretive Data:
If value does not correlate with clinical findings, repeat the test and draw a sample and send it stat to Clinical Labs for confirmation.

ADMINISTRATIVE

LOINC Codes:
718-7

COMPLETE VIEW

Available Stat:
Yes

Test Code:
HEMPC1 (Test code)
HEMPOC (Battery)
Performing Lab:
Authorized Point of Care testing site staff

Performed:
24 hours per day, 7 days per week

Methodology:
Optical detection of azidemethemoglobin production (Hemocue)

Remarks:
Fingerstick sample:
1. Wipe away the first drop of blood.
2. Apply light pressure to the finger until a drop of blood forms. Do not squeeze the finger.
3. Hold the microcuvette by the wings with the pointed end away from you.
4. Touch the pointed tip of the microcuvette to the drop of blood.
5. Allow the microcuvette to fill by capillary action

Collect:
Hemocue cuvette

Amount to Collect:
Fingerstick: 0.01 mL blood (10 µL)
Vacutainer sample: 1 mL blood

Sample Type:
Fingerstick, EDTA or Heparinized whole blood

Minimum Volume:
Fingerstick: 0.01 mL blood (10 µL)
Vacutainer sample: 1 mL blood

Units:
g/dL

Reference Interval:

<table>
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<tbody>
<tr>
<td>0-7 days</td>
<td>14.5-22.5</td>
</tr>
<tr>
<td>8-14 days</td>
<td>13.5-21.5</td>
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<tr>
<td>2-4 weeks</td>
<td>12.5-20.5</td>
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<tr>
<td>1-2 months</td>
<td>10.0-18.0</td>
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<tr>
<td>2-3 months</td>
<td>9.0-14.0</td>
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<tr>
<td>3-6 months</td>
<td>9.5-13.5</td>
</tr>
<tr>
<td>6-24 months</td>
<td>11.0-13.5</td>
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<tr>
<td>2-5 years</td>
<td>11.2-13.5</td>
</tr>
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<td>5-8 years</td>
<td>11.4-15.5</td>
</tr>
<tr>
<td>8-12 years</td>
<td>11.6-15.5</td>
</tr>
</tbody>
</table>

Critical Values:
<= 7 g/dL

Interpretive Data:
If value does not correlate with clinical findings, repeat the test and draw a sample and send it stat to Clinical Labs for confirmation.

Synonyms:
- HEMPC1
- HEMPOC
- Hemocue

**Additional Information:**

Air bubbles in the microcuvette will result in erroneously low values. The microcuvette should be inspected for bubbles before testing.

The microcuvette should be filled in a continuous process. It should never be topped off after the initial filling.

Blood inside the HemoCue Classic will interfere with hemoglobin measurement.

Blood collected in vacutainer tubes with liquid anticoagulant may give erroneous readings due to the effects of dilution.

**LOINC Codes:**

718-7
POCT Hemoglobin A1c

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Performed:
During clinic hours
Methodology:
DCA 2000: Spectrophotometry (total hemoglobin), Latex agglutination inhibition (Hgb A1c)

Additional Information:
Comparison with central laboratory test:
In patients with elevated A1c levels, results determined by the point of care DCA2000 may run approximately 0.4 units lower than the HPLC method.

NOTE: The American Diabetes Association has indicated that point of care Hgb A1c analyzers are not sufficiently accurate for use in diagnosis of diabetes and that only laboratory based A1c analyzers should be used for this purpose. Point of care Hgb A1c analyzers like the DCA platform are intended for monitoring trends in glucose control over time. When Hgb A1c is measured with the DCA, clinicians can be reasonably (95%) certain that an absolute change in A1c of more than about 0.7 - 0.8 represents a statistically significant change in glycemic control. When Hgb A1c is measured with the central lab assay, clinicians can be reasonably certain (95%) that an absolute change in A1c of 0.5 or more represents a statistically significant change in glycemic control (Clinical Chemistry 57:205-214, 2011, supplementary Table 1).

Interferences:
This method is useful for samples having between 7.0 and 24.0 g/dL of hemoglobin. Patients with severe anemia or polycythemia must not be tested with this assay.

Hemoglobin F less than 10% will not affect the assay. Patients with high levels of Hgb F (e.g. HPFH) must be referred for another method.

This method is NOT recommended for patients with Hemoglobin C or Hemoglobin S.

Bilirubin greater than 20.0 mg/dL has been shown not to interfere with this assay.

Triglycerides greater than 1347 mg/dL have been shown not to interfere with this assay.

Samples that are noted to be severely lipemic or frozen for long periods of time are not recommended with this assay system.

Common oral diabetic medications (Diabinase, Orinase, Tolinase, Micronase, Dymelor, Glipizide) do not interfere with this methodology.

In diabetic patients who have experienced recent blood loss, hemolysis or have elevated reticulocyte counts for other reasons the HgBA1c level may be lowered and may not reflect actual glycemic control.

Synonyms:
- Glyco-hgb
- Glycohemoglobin
- Glycosylated hemoglobin

COLLECTION

Sample Type:
Fingerstick or Anticoagulated whole blood
Collect:
Lavender or Green top, or DCA 2000 capillary tube
Amount to Collect:
Fingerstick sample or 1 mL blood if collected in vacutainer
Preferred Volume:
0.1 mL blood
Minimum Volume:
0.1 mL blood

Stability (from collection to initiation):
Samples must be tested within 5 minutes after filling DCA capillary

PROCESSING

Test Group:
Hemoglobin A1c

Performing Lab:
Authorized Point of Care testing site staff

Preferred Volume:
0.1 mL blood

Minimum Volume:
0.1 mL blood

Stability (from collection to initiation):
Samples must be tested within 5 minutes after filling DCA capillary

RESULT INTERPRETATION

Units:
%

Reference Interval:
4.2-6.0%

Additional Information:
Comparison with central laboratory test:
In patients with elevated A1c levels, results determined by the point of care DCA2000 may run approximately 0.4 units lower than the HPLC method.

NOTE: The American Diabetes Association has indicated that point of care Hgb A1c analyzers are not sufficiently accurate for use in diagnosis of diabetes and that only laboratory based A1c analyzers should be used for this purpose. Point of care Hgb A1c analyzers like the DCA platform are intended for monitoring trends in glucose control over time. When Hgb A1c is measured with the DCA, clinicians can be reasonably (95%) certain that an absolute change in A1c of more than about 0.7 - 0.8 represents a statistically significant change in glycemic control. When Hgb A1c is measured with the central lab assay, clinicians can be reasonably certain (95%) that an absolute change in A1c of 0.5 or more represents a statistically significant change in glycemic control (Clinical Chemistry 57:205-214, 2011, supplementary Table 1).

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Triglycerides greater than 1347 mg/dL have been shown not to interfere with this assay.

Samples that are noted to be severely lipemic or frozen for long periods of time are not recommended with this assay system.

Common oral diabetic medications (Diabinase, Orinase, Tolinase, Micronase, Dymelor, Glipizide) do not interfere with this methodology.

In diabetic patients who have experienced recent blood loss, hemolysis or have elevated reticulocyte counts for other reasons the HgBA1c level may be lowered and may not reflect actual glycemic control.

COMPLETE VIEW

Available Stat:
Yes

Test Group:
- Hemoglobin A1c

Performing Lab:
- Authorized Point of Care testing site staff

Performed:
- During clinic hours

Methodology:
- DCA 2000: Spectrophotometry (total hemoglobin), Latex agglutination inhibition (Hgb A1c)

Collect:
- Lavender or Green top, or DCA 2000 capillary tube

Amount to Collect:
- Fingerstick sample or 1 mL blood if collected in vacutainer

Sample Type:
- Fingerstick or Anticoagulated whole blood

Preferred Volume:
- 0.1 mL blood

Minimum Volume:
- 0.1 mL blood

Units:
- %

Reference Interval:
- 4.2-6.0%

Synonyms:
- Glyco-hgb
- Glycohemoglobin
- Glycosylated hemoglobin

Stability (from collection to initiation):
- Samples must be tested within 5 minutes after filling DCA capillary

Additional Information:
Comparison with central laboratory test:
In patients with elevated A1c levels, results determined by the point of care DCA2000 may run approximately 0.4 units lower than the HPLC method.

NOTE: The American Diabetes Association has indicated that point of care Hgb A1c analyzers are not sufficiently accurate for use in diagnosis of diabetes and that only laboratory based A1c analyzers should be used for this purpose. Point of care Hgb A1c analyzers like the DCA platform are intended for monitoring trends in glucose control over time. When Hgb A1c is measured with the DCA, clinicians can be reasonably (95%) certain that an absolute change in A1c of more than about 0.7 - 0.8 represents a statistically significant change in glycemic control. When Hgb A1c is measured with the central lab assay, clinicians can be reasonably certain (95%) that an absolute change in A1c of 0.5 or more represents a statistically significant change in glycemic control (Clinical Chemistry 57:205-214, 2011, supplementary Table 1).

Interferences:
This method is useful for samples having between 7.0 and 24.0 g/dL of hemoglobin. Patients with severe anemia or polycythemia must not be tested with this assay.

Hemoglobin F less than 10% will not affect the assay. Patients with high levels of Hgb F (e.g. HPFH) must be referred for another method.

This method is NOT recommended for patients with Hemoglobin C or Hemoglobin S.

Bilirubin greater than 20.0 mg/dL has been shown not to interfere with this assay.

Triglycerides greater than 1347 mg/dL have been shown not to interfere with this assay.

Samples that are noted to be severely lipemic or frozen for long periods of time are not recommended with this assay system.

Common oral diabetic medications (Diabinase, Orinase, Tolinase, Micronase, Dymelor, Glipizide) do not interfere with this methodology.

In diabetic patients who have experienced recent blood loss, hemolysis or have elevated reticulocyte counts for other reasons the
HgBA1c level may be lowered and may not reflect actual glycemic control.
POCT HIV 1/2 Rapid Antibody Screen

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of care testing staff. Currently this test is limited to the Positive Health practice
Performed:
Test available 24 hours per day 7 days per week
Methodology:
OraQuick ADVANCE Qualitative Immunoassay
Additional Information:
Individuals infected with HIV-1 or HIV-2 who are receiving highly active anti-retroviral therapy (HAART) may produce false negative results.
Clinical data has not been collected to demonstrate the performance of the OraQuick ADVANCE™ Rapid HIV1/2 Antibody testing on persons under 12 years of age.
A reactive result suggests the presence of HIV-1 and/or HIV-2 antibodies in the specimen. This test is intended as an aid in the diagnosis of infection with HIV-1 and/or HIV-2. AIDS and AIDS-related conditions are clinical syndromes and their diagnosis can only be established clinically
For a reactive result, the intensity of the test line does not necessarily correlate with the titer of antibody in the specimen.
A non-reactive result does not preclude the possibility of exposure to HIV. An antibody response to recent exposure may take several months to reach detectable levels.
Reflex Testing:
If the screening test is positive a serum sample should be submitted and the HIV Ag/Ab combination test (HIVAA) ordered for confirmation.

Synonyms:
- HIV Ab
- HIV Antibody
- Human Immunodeficiency Virus Antibody
- Human Immunodeficiency Virus Ab
- AIDS
- Rapid HIV screen

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
1 mL blood
Preferred Volume:
1 mL EDTA whole blood
Minimum Volume:
0.5 mL EDTA whole blood
Remarks:
Document patient consent to testing in the medical record
Test Group:
HIV

Performing Lab:
Authorized Point of care testing staff. Currently this test is limited to the Positive Health practice

Preferred Volume:
1 mL EDTA whole blood

Minimum Volume:
0.5 mL EDTA whole blood

RESULT INTERPRETATION

Reference Interval:
Negative

Critical Values:
Positive (See Reflex Information)

Additional Information:
Individuals infected with HIV-1 or HIV-2 who are receiving highly active anti-retroviral therapy (HAART) may produce false negative results.

Clinical data has not been collected to demonstrate the performance of the OraQuick ADVANCE™ Rapid HIV1/2 Antibody testing on persons under 12 years of age.

A reactive result suggests the presence of HIV-1 and/or HIV-2 antibodies in the specimen. This test is intended as an aid in the diagnosis of infection with HIV-1 and/or HIV-2. AIDS and AIDS-related conditions are clinical syndromes and their diagnosis can only be established clinically

For a reactive result, the intensity of the test line does not necessarily correlate with the titer of antibody in the specimen.

A non-reactive result does not preclude the possibility of exposure to HIV. An antibody response to recent exposure may take several months to reach detectable levels.

ADMINISTRATIVE

CPT Codes:
86703-92

COMPLETE VIEW

Available Stat:
Yes

Test Group:
HIV

Performing Lab:
Authorized Point of care testing staff. Currently this test is limited to the Positive Health practice

Performed:
Test available 24 hours per day 7 days per week

Methodology:
OraQuick ADVANCE Qualitative Immunoassay

Remarks:
Document patient consent to testing in the medical record

Collect:
Lavender top

Amount to Collect:
1 mL blood

Sample Type:
EDTA whole blood
**Preferred Volume:**
1 mL EDTA whole blood

**Minimum Volume:**
0.5 mL EDTA whole blood

**Reference Interval:**
Negative

**Critical Values:**
Positive (See Reflex Information)

**Synonyms:**
- HIV Ab
- HIV Antibody
- Human Immunodeficiency Virus Antibody
- Human Immunodeficiency Virus Ab
- AIDS
- Rapid HIV screen

**Reflex Testing:**
If the screening test is positive a serum sample should be submitted and the HIV Ag/Ab combination test (HIVAA) ordered for confirmation.

**Additional Information:**
Individuals infected with HIV-1 or HIV-2 who are receiving highly active anti-retroviral therapy (HAART) may produce false negative results.

Clinical data has not been collected to demonstrate the performance of the OraQuick ADVANCE™ Rapid HIV1/2 Antibody testing on persons under 12 years of age.

A reactive result suggests the presence of HIV-1 and/or HIV-2 antibodies in the specimen. This test is intended as an aid in the diagnosis of infection with HIV-1 and/or HIV-2. AIDS and AIDS-related conditions are clinical syndromes and their diagnosis can only be established clinically.

For a reactive result, the intensity of the test line does not necessarily correlate with the titer of antibody in the specimen.

A non-reactive result does not preclude the possibility of exposure to HIV. An antibody response to recent exposure may take several months to reach detectable levels.

**CPT Codes:**
86703-92
POCT Influenza Virus

ORDERING

Available Stat:  Yes
Performing Lab:  Authorized Point of Care testing site staff
Performed:  During clinic hours
Methodology:  Immunoassay
Additional Information:
This test does not differentiate between influenza types A and B.
Test results must be evaluated in conjunction with other clinical data available
A negative test result may occur if the level of antigen in a sample is below the detection limit of the test or from improper sample collection.
Negative test results are not intended to rule-out other non-influenza viral infections.
See also Respiratory Virus DFA

Synonyms:
• flu

COLLECTION

Sample Type:  Nasal swab or nasal wash
Collect:
Swab or clean container
Remarks:
Nasal Swab Sample:
For proper test performance, use the swabs supplied in the kit.
Insert sterile swab into the nostril that presents the most secretion under visual inspection. Gently rotate the swab inward, until resistance is met at the level of the turbinates (less than one inch into the nostril). Rotate the swab a few times against the nasal wall.

Nasal Wash or Aspirate Sample:
1. For Older Children and Adults
With the patient's head hyper-extended, instill about 2.5 ml of sterile saline into one nostril with a syringe. To collect the wash, place specimen container directly under the nose with slight pressure on the upper lip. Tilt the head forward and allow the fluid to flow into the specimen container. Repeat for the other nostril, collecting the fluid into the same specimen container.

2. For Younger Children
Sit child on parent's lap facing forward, with the child's back against the parent's chest. The parent should wrap one arm around the child in a manner that will restrain the child's body and arms.

Fill an aspiration bulb or bulb syringe with up to 2.5 mL of sterile, normal saline (depending on the size of the child), and instill the saline into one nostril while the head is tilted back.

Release the pressure on the bulb to aspirate the specimen back into the bulb. Transfer the specimen into specimen container. Repeat the process for the child's other nostril and transfer the specimen into the same specimen container.

PROCESSING
Test Group: Influenza
Performing Lab: Authorized Point of Care testing site staff

RESULT INTERPRETATION

Reference Interval: Negative
Additional Information:
This test does not differentiate between influenza types A and B.
Test results must be evaluated in conjunction with other clinical data available
A negative test result may occur if the level of antigen in a sample is below the detection limit of the test or from improper sample collection.
Negative test results are not intended to rule-out other non-influenza viral infections.
See also Respiratory Virus DFA

COMPLETE VIEW

Available Stat: Yes
Test Group: Influenza
Performing Lab: Authorized Point of Care testing site staff
Performed: During clinic hours
Methodology: Immunoassay
Remarks:
Nasal Swab Sample:
For proper test performance, use the swabs supplied in the kit.
Insert sterile swab into the nostril that presents the most secretion under visual inspection. Gently rotate the swab inward, until resistance is met at the level of the turbinates (less than one inch into the nostril). Rotate the swab a few times against the nasal wall.

Nasal Wash or Aspirate Sample:
1. For Older Children and Adults
With the patient's head hyper-extended, instill about 2.5 ml of sterile saline into one nostril with a syringe. To collect the wash, place specimen container directly under the nose with slight pressure on the upper lip. Tilt the head forward and allow the fluid to flow into the specimen container. Repeat for the other nostril, collecting the fluid into the same specimen container.

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Fill an aspiration bulb or bulb syringe with up to 2.5 mL of sterile, normal saline (depending on the size of the child), and instill the saline into one nostril while the head is tilted back.
Release the pressure on the bulb to aspirate the specimen back into the bulb. Transfer the specimen into specimen container. Repeat the process for the child's other nostril and transfer the specimen into the same specimen container.

Collect:
Swab or clean container
Sample Type:
   Nasal swab or nasal wash

Reference Interval:
   Negative

Synonyms:
   • flu

Additional Information:
   This test does not differentiate between influenza types A and B.

   Test results must be evaluated in conjunction with other clinical data available

   A negative test result may occur if the level of antigen in a sample is below the detection limit of the test or from improper sample collection.

   Negative test results are not intended to rule-out other non-influenza viral infections.

   See also Respiratory Virus DFA
POCT iStat Chem8

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized nursing and physician staff
Methodology:
iStat Chem8 cartridge

COLLECTION

Sample Type:
Heparinized capillary whole blood, Arterial blood gas sample
Preferred Volume:
0.1 mL
Minimum Volume:
0.1 mL
Stability (from collection to initiation):
Sample should be tested immediately after collection.

PROCESSING

Test Code:
CHEM8
Performing Lab:
Authorized nursing and physician staff
Preferred Volume:
0.1 mL
Minimum Volume:
0.1 mL
Stability (from collection to initiation):
Sample should be tested immediately after collection.

RESULT INTERPRETATION

Units:
See normal range information

<table>
<thead>
<tr>
<th>TEST</th>
<th>SPECIMEN SOURCE</th>
<th>NORMAL VALUE</th>
<th>CRITICAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CO2 (mmol/L)</td>
<td>&lt;=15 year</td>
<td>16 to 30</td>
<td>&lt;=7.0</td>
</tr>
<tr>
<td></td>
<td>&gt;16 year</td>
<td>22 to 32</td>
<td></td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 year</td>
<td>12.0 to 15.5</td>
<td>&lt;=7.0</td>
<td></td>
</tr>
<tr>
<td>12 year</td>
<td>11.8 to 15.5</td>
<td>&lt;=7.0</td>
<td></td>
</tr>
<tr>
<td>8 year</td>
<td>11.6 to 15.5</td>
<td>&lt;=7.0</td>
<td></td>
</tr>
<tr>
<td>5 year</td>
<td>11.4 to 15.5</td>
<td>&lt;=7.0</td>
<td></td>
</tr>
<tr>
<td>2 year</td>
<td>11.2 to 13.5</td>
<td>&lt;=7.0</td>
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</tr>
<tr>
<td>6 month</td>
<td>11.0 to 13.5</td>
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<td>3 month</td>
<td>9.5 to 13.5</td>
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<td>61 day</td>
<td>9.0 to 14.0</td>
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<td>1 month</td>
<td>10.0 to 18.0</td>
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<td>Age</td>
<td>Value Range</td>
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<tr>
<td>8 day</td>
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<tr>
<td>0 day</td>
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<tr>
<td>Male</td>
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<tr>
<td>18 year</td>
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<td>15 year</td>
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<tr>
<td>12 year</td>
<td>12.3 to 16.0</td>
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<tr>
<td>6 month</td>
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</tr>
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<td>0 day</td>
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</tr>
<tr>
<td>Anion Gap (mmol/L)</td>
<td>Whole blood 4 to 14</td>
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</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>Whole blood</td>
<td></td>
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</tr>
<tr>
<td>BUN (mg/dL)</td>
<td>&lt;=4 year 5 to 27</td>
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<td></td>
<td>&gt;5 year 6 to 22</td>
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</tr>
<tr>
<td>NA (mmol/L)</td>
<td>Whole Blood 136 to 146</td>
<td></td>
<td></td>
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<tr>
<td>K (mmol/L)</td>
<td>&lt;=1 year 3.0 to 5.4</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>&gt;1 year 3.4 to 4.5</td>
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<tr>
<td>CA++ (mmol/L)</td>
<td>&lt;6 months 0.95 to 1.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;= 6 months 1.15 to 1.29</td>
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<tr>
<td>Glucose (mg/dL)</td>
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<td>Neonate 55-115</td>
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<td>CL- (mmol/L)</td>
<td>whole blood 98 to 106</td>
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<tr>
<td>HCT(%)</td>
<td>Adult Male 41% to 53%</td>
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<tr>
<td></td>
<td>Adult Female 36% to 46%</td>
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</table>

**ADMINISTRATIVE**

**CPT Codes:**
80047, 85014

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
CHEM8

**Performing Lab:**
Authorized nursing and physician staff

**Methodology:**
iStat Chem8 cartridge

**Sample Type:**
Heparinized capillary whole blood, Arterial blood gas sample

**Preferred Volume:**
0.1 mL

**Minimum Volume:**
0.1 mL

**Units:**
See normal range information

**Reference Interval:**

<table>
<thead>
<tr>
<th>Test</th>
<th>Value Range</th>
<th>Normal Value</th>
<th>Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total CO2 (mmol/L)</td>
<td>&lt;=15 year 16 to 30</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>&gt;16 year 22 to 32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>Female 12.0 to 15.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 year 11.8 to 15.5</td>
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</tr>
<tr>
<td></td>
<td>12 year 11.8 to 15.5</td>
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<tr>
<td></td>
<td>8 year 11.6 to 15.5</td>
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<tr>
<td></td>
<td>5 year 11.4 to 15.5</td>
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</tr>
<tr>
<td></td>
<td>&lt;=7.0</td>
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Test information subject to change.
<table>
<thead>
<tr>
<th>Age</th>
<th>Lower Limit</th>
<th>Upper Limit</th>
<th>Anion Gap (mmol/L)</th>
<th>Creatinine (mg/dL)</th>
<th>BUN (mg/dL)</th>
<th>NA (mmol/L)</th>
<th>K (mmol/L)</th>
<th>CA++ (mmol/L)</th>
<th>Glucose (mg/dL)</th>
<th>CL- (mmol/L)</th>
<th>HCT(%)</th>
</tr>
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<tbody>
<tr>
<td>2 year</td>
<td>11.2</td>
<td>13.5</td>
<td>&lt;= 7.0</td>
<td>4 to 14</td>
<td>&lt;= 4 year</td>
<td>5 to 27</td>
<td>&lt;= 1 year</td>
<td>&lt; 6 months</td>
<td>70-199</td>
<td>98 to 106</td>
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<td>6 month</td>
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<td>13.5</td>
<td>&lt;= 7.0</td>
<td>4 to 14</td>
<td>&lt;= 4 year</td>
<td>5 to 27</td>
<td>&lt;= 1 year</td>
<td>&gt; 6 months</td>
<td>&lt; 60 or &gt; 400</td>
<td>&lt;40 or &gt; 150</td>
<td>Adult Female</td>
</tr>
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<td>1 month</td>
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<td>18.0</td>
<td>&lt;= 7.0</td>
<td>&lt;= 7.0</td>
<td>&gt; 5 year</td>
<td>6 to 22</td>
<td>&gt; 1 year</td>
<td>&gt;= 6 months</td>
<td>&lt;60 or &gt; 400</td>
<td>&lt;40 or &gt; 150</td>
<td>Adult Female</td>
</tr>
<tr>
<td>14 day</td>
<td>12.5</td>
<td>20.5</td>
<td>&lt;= 7.0</td>
<td>&lt;= 7.0</td>
<td>&gt; 5 year</td>
<td>6 to 22</td>
<td>&gt; 1 year</td>
<td>&gt;= 6 months</td>
<td>&lt;60 or &gt; 400</td>
<td>&lt;40 or &gt; 150</td>
<td>Adult Female</td>
</tr>
<tr>
<td>8 day</td>
<td>13.5</td>
<td>21.5</td>
<td>&lt;= 7.0</td>
<td>&lt;= 7.0</td>
<td>&gt; 5 year</td>
<td>6 to 22</td>
<td>&gt; 1 year</td>
<td>&gt;= 6 months</td>
<td>&lt;60 or &gt; 400</td>
<td>&lt;40 or &gt; 150</td>
<td>Adult Female</td>
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<tr>
<td>0 day</td>
<td>14.5</td>
<td>22.5</td>
<td>&lt;= 7.0</td>
<td>&lt;= 7.0</td>
<td>&gt; 5 year</td>
<td>6 to 22</td>
<td>&gt; 1 year</td>
<td>&gt;= 6 months</td>
<td>&lt;60 or &gt; 400</td>
<td>&lt;40 or &gt; 150</td>
<td>Adult Female</td>
</tr>
</tbody>
</table>

**Stability (from collection to initiation):**

Sample should be tested immediately after collection.

**CPT Codes:**

80047, 85014
POCT Lipid Testing

ORDERING

Available Stat:
Yes

Performing Lab:
Authorized Point of Care testing site staff

Performed:
During clinic hours

Methodology:
Cholestech LDX(TM)

Additional Information:
The measuring range for total cholesterol is 100 - 500 mg/dL. Results outside this range will appear as < 100 mg/dL or > 500 mg/dL.
The measuring range for HDL cholesterol is 15 - 100 mg/dL. Results outside this range will appear as < 15 mg/dL or > 100 mg/dL.
The measuring range for triglycerides is 45 - 650 mg/dL. Results outside this range will appear as < 45 mg/dL or > 650 mg/dL.

If the triglycerides are > 400 mg/dL, the estimated LDL will not be calculated.

If the total cholesterol, HDL cholesterol or triglyceride result is outside the measuring range, the LDL will appear as N/A.

If the triglycerides are > 650 mg/dL, the HDL result may not be accurate and will appear as N/A. Triglycerides > 400 will affect the LDL calculated result and it will not be reported

The measuring range for glucose is 50-500 mg/dL. Results outside this range will appear as < 50 mg/dL or > 500 mg/dL. The glucose test is specific for D-glucose. Other sugars that may be present in the blood do not react in the glucose test (i.e., fructose, lactose).

Samples with results outside of the measuring range must be sent to the Clinical Laboratory for testing.

Performance of the Cholestech LDX System has not been tested on samples from newborns

The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not be routinely required.

Synonyms:
- total cholesterol
- HDL cholesterol
- triglycerides

COLLECTION

Sample Type:
Heparinized whole blood

Collect:
Light Green top or Cholestech heparinized capillary tube

Amount to Collect:
5 mL blood in vacutainer or 60 µL in capillary tube

Preferred Volume:
60 µL

Minimum Volume:
35 µL

Remarks:
See Cholestech LDX Procedure
Test Group: Cholesterol

Performing Lab: Authorized Point of Care testing site staff

Preferred Volume: 60 µL

Minimum Volume: 35 µL

RESULT INTERPRETATION

Units: mg/dL

Reference Interval:

Total cholesterol:
- Children and Adolescents (< 20 y/o):
  - Acceptable <170 mg/dL
  - Borderline 170-199 mg/dL
  - High >199 mg/dL

- Adults (>= 20 y/o):
  - Desirable <200 mg/dL
  - Borderline 200-239 mg/dL
  - High >239 mg/dL

HDL Cholesterol:
- Acceptable >39 mg/dL
- Higher risk <40 mg/dL
- Lower risk >59 mg/dL

Triglycerides:
- Desirable (if fasting sample) <150 mg/dL

Desirable (if non-fasting sample)<200 mg/dL
If non-fasting sample is 200 mg/dL or more, testing on fasting sample is recommended

LDL cholesterol:
- Children and Adolescents (< 20 y/o): Acceptable <110 mg/dL
  - Borderline high 110-129 mg/dL
  - High >129 mg/dL

- Adults: (>= 20 y/o):
  - Optimal <100 mg/dL
  - Near or above optimal 100-129 mg/dL
  - Borderline high-risk 130-159 mg/dL
  - High-risk 160-189 mg/dL
  - Very high-risk >189 mg/dL

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association Guidelines, 2013

Additional Information:
The measuring range for total cholesterol is 100 - 500 mg/dL. Results outside this range will appear as < 100 mg/dL or > 500 mg/dL.
The measuring range for HDL cholesterol is 15 - 100 mg/dL. Results outside this range will appear as < 15 mg/dL or > 100 mg/dL.

The measuring range for triglycerides is 45 - 650 mg/dL. Results outside this range will appear as < 45 mg/dL or > 650 mg/dL.

If the triglycerides are > 400 mg/dL, the estimated LDL will not be calculated.

If the total cholesterol, HDL cholesterol or triglyceride result is outside the measuring range, the LDL will appear as N/A.

If the triglycerides are > 650 mg/dL, the HDL result may not be accurate and will appear as N/A. Triglycerides > 400 will affect the LDL calculated result and it will not be reported.

The measuring range for glucose is 50-500 mg/dL. Results outside this range will appear as < 50 mg/dL or > 500 mg/dL. The glucose test is specific for D-glucose. Other sugars that may be present in the blood do not react in the glucose test (i.e., fructose, lactose).

Samples with results outside of the measuring range must be sent to the Clinical Laboratory for testing.

Performance of the Cholestech LDX System has not been tested on samples from newborns.

The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not be routinely required.

<table>
<thead>
<tr>
<th>COMPLETE VIEW</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Available Stat:</strong> Yes</td>
</tr>
<tr>
<td><strong>Test Group:</strong> Cholesterol</td>
</tr>
</tbody>
</table>
| **Performing Lab:** 
  Authorized Point of Care testing site staff |
| **Performed:** During clinic hours |
| **Methodology:** Cholestech LDX(TM) |
| **Remarks:** See Cholestech LDX Procedure |
| **Collect:** Light Green top or Cholestech heparinized capillary tube |
| **Amount to Collect:** 5 mL blood in vacutainer or 60 µL in capillary tube |
| **Sample Type:** Heparinized whole blood |
| **Preferred Volume:** 60 µL |
| **Minimum Volume:** 35 µL |
| **Units:** mg/dL |
| **Reference Interval:** 
  Total cholesterol: 
  Children and Adolescents (< 20 y/o): 
  Acceptable <170 mg/dL 
  Borderline 170-199 mg/dL 
  High >199 mg/dL 
  Adults (>= 20 y/o): 
  Desirable <200 mg/dL |
Borderline 200-239 mg/dL
High >239 mg/dL

HDL Cholesterol:
Acceptable >39 mg/dL
Higher risk <40 mg/dL
Lower risk >59 mg/dL

Triglycerides:
Desirable (if fasting sample) <150 mg/dL
Desirable (if non-fasting sample)<200 mg/dL
If non-fasting sample is 200 mg/dL or more, testing on fasting sample
is recommended)

LDL cholesterol:
Children and Adolescents (< 20 y/o): Acceptable <110 mg/dL
Borderline high 110-129 mg/dL
High >129 mg/dL

Adults: (>= 20 y/o):
Optimal <100 mg/dL
Near or above optimal 100-129 mg/dL
Borderline high-risk 130-159 mg/dL
High-risk 160-189 mg/dL
Very high-risk >189 mg/dL

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association
Guidelines, 2013

Synonyms:
- total cholesterol
- HDL cholesterol
- triglycerides

Additional Information:
The measuring range for total cholesterol is 100 - 500 mg/dL. Results outside this range will appear as < 100 mg/dL or > 500 mg/dL.
The measuring range for HDL cholesterol is 15 - 100 mg/dL. Results outside this range will appear as < 15 mg/dL or > 100 mg/dL.
The measuring range for triglycerides is 45 - 650 mg/dL. Results outside this range will appear as < 45 mg/dL or > 650 mg/dL.
If the triglycerides are > 400 mg/dL, the estimated LDL will not be calculated.
If the total cholesterol, HDL cholesterol or triglyceride result is outside the measuring range, the LDL will appear as N/A.
If the triglycerides are > 650 mg/dL, the HDL result may not be accurate and will appear as N/A. Triglycerides > 400 will affect the LDL
calculated result and it will not be reported
The measuring range for glucose is 50-500 mg/dL. Results outside this range will appear as < 50 mg/dL or > 500 mg/dL. The glucose test is specific for D-glucose. Other sugars that may be present in the blood do not
react in the glucose test (i.e., fructose, lactose).
Samples with results outside of the measuring range must be sent to the Clinical Laboratory for testing.
Performance of the Cholestech LDX System has not been tested on samples from newborns
The strict requirement of a fasting sample for lipid analysis is no longer considered necessary by many authorities. Changes in CV risk
management guidelines, and the results of studies comparing fasting to non-fasting lipid levels, indicate that fasting samples need not
be routinely required.
POCT Microalbumin Urinalysis Dipstick

ORDERING

Available Stat:
Yes
Performing Lab:
In Selected clinics by authorized Point of Care testing site staff
Synonyms:
• UA
• Urine dipstick
• Urine Microalbumin
• Urine Albumin
• Urine Creatinine
• Urine Albumin to Creatinine Ratio

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine
Remarks:
First A.M. void preferred

PROCESSING

Performing Lab:
In Selected clinics by authorized Point of Care testing site staff
Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Reference Interval:
Albumin-to-Creatinine Ratio <30 mg/g creatinine

ADMINISTRATIVE

CPT Codes:
82044

COMPLETE VIEW
Available Stat: Yes
Performing Lab: In Selected clinics by authorized Point of Care testing site staff
Remarks: First A.M. void preferred
Collect: Urine cup
Amount to Collect: 20 mL urine
Sample Type: Random urine
Preferred Volume: 20 mL urine
Minimum Volume: 5 mL urine
Reference Interval: Albumin-to-Creatinine Ratio <30 mg/g creatinine
Synonyms:
- UA
- Urine dipstick
- Urine Microalbumin
- Urine Albumin
- Urine Creatinine
- Urine Albumin to Creatinine Ratio
CPT Codes:
82044
POCT Multistix 10SG Urinalysis Dipstick

ORDERING

Available Stat:
Yes
Performing Lab:
In Selected clinics by authorized Point of Care testing site staff
Additional Information:
Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.

pH: Reported over the range of 5.0 to >= 9.0 and is diet-dependent; a level > 9.0 suggests infection with a urea-splitting organism.

Bilirubin: False-positive results for bilirubin may occur due to the intrinsic coloration of urine. If concerns exist in this regard a sample should be sent to the clinical laboratory for confirmatory testing.

Hemoglobin: Dipstick testing does not distinguish between hemoglobin and myoglobin. To evaluate the possibility of myoglobinuria due to rhabdomyolysis send a serum sample to the clinical laboratory for Total CK, which will be markedly elevated in rhabdomyolysis.

Nitrite: A positive urinary nitrite test is highly suggestive of a urinary infection, but in a low risk population may detect as few as 50% of infections found on culture, particularly if urinary frequency is high, the diet is low in nitrate substrate or, of course, if the organisms are not nitrate-producers.

Synonyms:
- UA
- Urine dipstick
- Urine pH
- Specific gravity, urine
- Urine hemoglobin
- Urine protein
- Urine glucose
- Urine nitrate
- Urine Leukocyte esterase
- Urine ketones
- Urine bilirubin
- Urobilinogen

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine
Remarks:
First A.M. void preferred
Performing Lab:
In Selected clinics by authorized Point of Care testing site staff

Preferred Volume:
20 mL urine
Minimum Volume:
5 mL urine

RESULT INTERPRETATION

Reference Interval:
- Protein: Negative
- Glucose: Negative
- Ketones: Negative
- Bilirubin: Negative
- Hemoglobin (Myoglobin): Negative
- Nitrite: Negative
- Leukocyte Esterase: Negative
- pH: 4.5-8.0
- Specific Gravity: 1.002-1.030
- Urobilinogen: <= 1.0 mg/dL

Additional Information:
- Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.

- pH: Reported over the range of 5.0 to >= 9.0 and is diet-dependent; a level > 9.0 suggests infection with a urea-splitting organism.

- Bilirubin: False-positive results for bilirubin may occur due to the intrinsic coloration of urine. If concerns exist in this regard a sample should be sent to the clinical laboratory for confirmatory testing.

- Hemoglobin: Dipstick testing does not distinguish between hemoglobin and myoglobin. To evaluate the possibility of myoglobinuria due to rhabdomyolysis send a serum sample to the clinical laboratory for Total CK, which will be markedly elevated in rhabdomyolysis.

- Nitrite: A positive urinary nitrite test is highly suggestive of a urinary infection, but in a low risk population may detect as few as 50% of infections found on culture, particularly if urinary frequency is high, the diet is low in nitrate substrate or, of course, if the organisms are not nitrite-producers.

COMPLETE VIEW

Available Stat:
Yes

Performing Lab:
In Selected clinics by authorized Point of Care testing site staff

Remarks:
First A.M. void preferred

Collect:
Urine cup

Amount to Collect:
20 mL urine

Sample Type:
Random urine

Preferred Volume:
20 mL urine

Minimum Volume:
5 mL urine

Reference Interval:
Protein: Negative
Glucose: Negative
Ketones: Negative
Bilirubin: Negative
Hemoglobin (Myoglobin): Negative
Nitrite: Negative
Leukocyte Esterase: Negative
pH: 4.5-8.0
Specific Gravity: 1.002-1.030
Urobilinogen: <= 1.0 mg/dL

Synonyms:
- UA
- Urine dipstick
- Urine pH
- Specific gravity, urine
- Urine hemoglobin
- Urine protein
- Urine glucose
- Urine nitrate
- Urine Leukocyte esterase
- Urine ketones
- Urine bilirubin
- Urobilinogen

Additional Information:
Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.

pH: Reported over the range of 5.0 to >= 9.0 and is diet-dependent; a level > 9.0 suggests infection with a urea-splitting organism.

Bilirubin: False-positive results for bilirubin may occur due to the intrinsic coloration of urine. If concerns exist in this regard a sample should be sent to the clinical laboratory for confirmatory testing.

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POCT Multistix 9SG Urinalysis dipstick

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Additional Information:
Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.

pH: Reported over the range of 5.0 to >= 9.0 and is diet-dependent; a level > 9.0 suggests infection with a urea-splitting organism.

Bilirubin: False-positive results for bilirubin may occur due to the intrinsic coloration of urine. If concerns exist in this regard a sample should be sent to the clinical laboratory for confirmatory testing.

Hemoglobin: Dipstick testing does not distinguish between hemoglobin and myoglobin. To evaluate the possibility of myoglobinuria due to rhabdomyolysis send a serum sample to the clinical laboratory for Total CK, which will be markedly elevated in rhabdomyolysis.

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Synonyms:
- UA
- Urine dipstick
- Urine pH
- Specific gravity, urine
- Urine hemoglobin
- Urine protein
- Urine glucose
- Urine nitrate
- Urine Leukocyte esterase
- Urine ketones
- Urine bilirubin

COLLECTION

Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
20 mL
Minimum Volume:
5 mL
Remarks:
First A.M. void preferred

PROCESSING

Performing Lab:
Authorized Point of Care testing site staff
Preferred Volume: 20 mL
Minimum Volume: 5 mL

RESULT INTERPRETATION

Reference Interval:
- Protein: Negative
- Glucose: Negative
- Ketones: Negative
- Bilirubin: Negative
- Hemoglobin (Myoglobin): Negative
- Nitrite: Negative
- Leukocyte Esterase: Negative
- pH: 4.5-8.0
- Specific Gravity: 1.002-1.030

Additional Information:
- Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.
- pH: Reported over the range of 5.0 to >= 9.0 and is diet-dependent; a level > 9.0 suggests infection with a urea-splitting organism.
- Bilirubin: False-positive results for bilirubin may occur due to the intrinsic coloration of urine. If concerns exist in this regard a sample should be sent to the clinical laboratory for confirmatory testing.
- Hemoglobin: Dipstick testing does not distinguish between hemoglobin and myoglobin. To evaluate the possibility of myoglobinuria due to rhabdomyolysis send a serum sample to the clinical laboratory for Total CK, which will be markedly elevated in rhabdomyolysis.
- Nitrite: A positive urinary nitrite test is highly suggestive of a urinary infection, but in a low risk population may detect as few as 50% of infections found on culture, particularly if urinary frequency is high, the diet is low in nitrate substrate or, of course, if the organisms are not nitrite-producers.

COMPLETE VIEW

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Remarks:
First A.M. void preferred
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
20 mL
Minimum Volume:
5 mL
Reference Interval:
- Protein: Negative
- Glucose: Negative
- Ketones: Negative
- Bilirubin: Negative
- Hemoglobin (Myoglobin): Negative
- Nitrite: Negative
- Leukocyte Esterase: Negative
- pH: 4.5-8.0
Specific Gravity 1.002-1.030

**Synonyms:**
- UA
- Urine dipstick
- Urine pH
- Specific gravity, urine
- Urine hemoglobin
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**Additional Information:**

Specific Gravity: Reported as <= 1.005 to >= 1.030; the level found depends upon water intake; a fixed level around 1.010 which does not vary with the state of the patient's hydration suggests renal damage.

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Nitrite: A positive urinary nitrite test is highly suggestive of a urinary infection, but in a low risk population may detect as few as 50% of infections found on culture, particularly if urinary frequency is high, the diet is low in nitrate substrate or, of course, if the organisms are not nitrite-producers.
POCT pH, fluid

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Performed:
Test available 24 hours per day 7 days per week
Methodology:
pH paper (Hydrion 1-12)
Additional Information:
pH paper, used in the detection of vaginal, ocular or gastric pH, is intended for use by qualified medical and nursing staff and is intended as an aid to professional treatment.

pH paper can only indicate a pH value and should be used only as a monitoring tool.

Antibiotic therapy or infections of the vagina can lead to elevated vaginal pH resulting in a false interpretation of the presence of amniotic fluid. Where doubt exists, standard microbiological testing should be employed to exclude infection. Additionally, pH testing cannot distinguish amniotic fluid from urine. In instances where there is the possibility of urine contamination and/or where the patient has received antibiotic therapy, “fern” testing may be of value to verify the presence of amniotic fluid.

Synonyms:
- ocular pH
- vaginal pH
- Amniotic fluid pH
- gastric pH
- SROM
- Spontaneous rupture of membranes

COLLECTION

Sample Type:
Vaginal fluid, Ocular fluid, Gastric fluid
Amount to Collect:
N/A, direct application of patient sample to paper
Preferred Volume:
N/A, direct application of patient sample to paper
Remarks:
Use approx. a 2 inch strip of paper for each test.

Vaginal fluid:
Using a vaginal speculum, part the labia exposing the cervix and carefully insert the paper into the vagina. Do not allow the pH paper to come into contact with vaginal tissue during entry. Allow first and only contact to the test paper to occur with upper vaginal tissue (posterior vaginal fornix and external cervical os).

Ocular fluid:
With care, apply the tip of the paper to pooled ocular fluid. Avoid direct contact with eye tissue.

Gastric fluid:
Apply the tip of the paper to aspirated gastric fluid. Avoid contact with fluids other than that being tested.

Stability (from collection to initiation):
Samples should be tested immediately
**PROCESSING**

**Test Group:**
- pH

**Performing Lab:**
- Authorized Point of Care testing site staff

**Preferred Volume:**
- N/A, direct application of patient sample to paper

**Stability (from collection to initiation):**
- Samples should be tested immediately

**RESULT INTERPRETATION**

**Reference Interval:**
Results are reported in pH units as indicated from the color reaction of the paper. The colors below are descriptive only. The paper must be read against the pH color chart in the dispenser.

<table>
<thead>
<tr>
<th>Color</th>
<th>Approx. pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>4.5</td>
</tr>
<tr>
<td>Yellow-Green</td>
<td>5.0</td>
</tr>
<tr>
<td>Citrus Green</td>
<td>5.5</td>
</tr>
<tr>
<td>Apple Green</td>
<td>6.0</td>
</tr>
<tr>
<td>Green</td>
<td>6.5</td>
</tr>
<tr>
<td>Forest Green</td>
<td>7.0</td>
</tr>
<tr>
<td>Zucchinni Green</td>
<td>7.5</td>
</tr>
<tr>
<td>Midnight Blue Teal</td>
<td>8.0</td>
</tr>
<tr>
<td>Dark Midnight Blue</td>
<td>8.5</td>
</tr>
</tbody>
</table>

For vaginal fluid a pH > 6 indicates the presence of amniotic fluid and possible rupture of membranes.

**Additional Information:**

pH paper, used in the detection of vaginal, ocular or gastric pH, is intended for use by qualified medical and nursing staff and is intended as an aid to professional treatment.

pH paper can only indicate a pH value and should be used only as a monitoring tool.

Antibiotic therapy or infections of the vagina can lead to elevated vaginal pH resulting in a false interpretation of the presence of amniotic fluid. Where doubt exists, standard microbiological testing should be employed to exclude infection. Additionally, pH testing cannot distinguish amniotic fluid from urine. In instances where there is the possibility of urine contamination and/or where the patient has received antibiotic therapy, "fern" testing may be of value to verify the presence of amniotic fluid.

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Group:**
- pH

**Performing Lab:**
- Authorized Point of Care testing site staff

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- pH paper (Hydrion 1-12)

**Remarks:**
- Use approx. a 2 inch strip of paper for each test.

Vaginal fluid:
Using a vaginal speculum, part the labia exposing the cervix and carefully insert the paper into the vagina. Do not allow the pH paper to
come into contact with vaginal tissue during entry. Allow first and only contact to the test paper to occur with upper vaginal tissue (posterior vaginal fornix and external cervical os).

Ocular fluid:
With care, apply the tip of the paper to pooled ocular fluid. Avoid direct contact with eye tissue.

Gastric fluid:
Apply the tip of the paper to aspirated gastric fluid. Avoid contact with fluids other than that being tested.

**Amount to Collect:**
N/A, direct application of patient sample to paper

**Sample Type:**
Vaginal fluid, Ocular fluid, Gastric fluid

**Preferred Volume:**
N/A, direct application of patient sample to paper

**Reference Interval:**
Results are reported in pH units as indicated from the color reaction of the paper. The colors below are descriptive only. The paper must be read against the pH color chart in the dispenser.

<table>
<thead>
<tr>
<th>Color</th>
<th>Approx. pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>4.5</td>
</tr>
<tr>
<td>Yellow-Green</td>
<td>5.0</td>
</tr>
<tr>
<td>Citrus Green</td>
<td>5.5</td>
</tr>
<tr>
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<tr>
<td>Midnight Blue Teal</td>
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</tr>
<tr>
<td>Dark Midnight Blue</td>
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For vaginal fluid a pH > 6 indicates the presence of amniotic fluid and possible rupture of membranes.

**Synonyms:**
- ocular pH
- vaginal pH
- Amniotic fluid pH
- gastric pH
- SROM
- Spontaneous rupture of membranes

**Stability (from collection to initiation):**
Samples should be tested immediately

**Additional Information:**
- pH paper, used in the detection of vaginal, ocular or gastric pH, is intended for use by qualified medical and nursing staff and is intended as an aid to professional treatment.

- pH paper can only indicate a pH value and should be used only as a monitoring tool.

Antibiotic therapy or infections of the vagina can lead to elevated vaginal pH resulting in a false interpretation of the presence of amniotic fluid. Where doubt exists, standard microbiological testing should be employed to exclude infection. Additionally, pH testing cannot distinguish amniotic fluid from urine. In instances where there is the possibility of urine contamination and/or where the patient has received antibiotic therapy, “fern” testing may be of value to verify the presence of amniotic fluid.
POCT Prothrombin Time, Fingerstick

ORDERING

Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Performed:
During clinic hours
Methodology:
Thromboplastic activation, magnetic bead endpoint detection (Coaguchek S®)
Additional Information:
The CoaguChek should not be used with patients having the following conditions:
a. Lupus anticoagulant
b. Triglyceride > 500
c. Bilirubin > 20
d. On heparin therapy within the last 24 hours.
e. Hematocrit < 30 or > 52.

Collect only the first drop of blood from a fingerstick. The second drop of blood may have begun the clotting process.

Plasma and serum are not acceptable for testing.

The minimum volume is 10 uL. Low sample volume will cause ERROR display.

Do not attempt to add more blood to the test strip after testing has begun. Repeat test with a new fingerstick and equipment.

If the patient is on intravenous infusion therapy, do not collect the sample from the same arm.

The CoaguChek S monitor, test strips, and Code Chip operate on magnetic principles. It is important to keep these items away from magnetic materials and magnetic fields. Magnetic fields will erase the calibration information on the Code Chip

Synonyms:
- PT
- coumadin
- warfarin

COLLECTION

Sample Type:
Capillary (fingerstick) blood (venous whole blood acceptable)

Amount to Collect:
One drop

Preferred Volume:
One drop

Minimum Volume:
10 µL

Remarks:
Venipuncture samples may be collected using only plastic syringes. Glass tubes or syringes may not be used.

See Coaguchek procedure for proper fingerstick sample collection technique

PROCESSING

Test Group:
Prothrombin time
Performing Lab:
 Authorized Point of Care testing site staff

Preferred Volume:
 One drop

Minimum Volume:
 10 µL

RESULT INTERPRETATION

Units:
 INR

Reference Interval:
 Normal (untreated): 0.9-1.2

Critical Values:
 An INR > 5.0 must be confirmed with a Prothrombin Time performed in the Clinical Laboratory

Additional Information:
 The CoaguChek should not be used with patients having the following conditions:
 a. Lupus anticoagulant
 b. Triglyceride > 500
 c. Bilirubin > 20
 d. On heparin therapy within the last 24 hours.
 e. Hematocrit < 30 or > 52.

Collect only the first drop of blood from a fingerstick. The second drop of blood may have begun the clotting process.

Plasma and serum are not acceptable for testing.

The minimum volume is 10 µL. Low sample volume will cause ERROR display.

Do not attempt to add more blood to the test strip after testing has begun. Repeat test with a new fingerstick and equipment.

If the patient is on intravenous infusion therapy, do not collect the sample from the same arm.

The CoaguChek S monitor, test strips, and Code Chip operate on magnetic principles. It is important to keep these items away from magnetic materials and magnetic fields. Magnetic fields will erase the calibration information on the Code Chip.

COMPLETE VIEW

Available Stat:
 Yes

Test Group:
 Prothrombin time

Performing Lab:
 Authorized Point of Care testing site staff

Performed:
 During clinic hours

Methodology:
 Thromboplastin activation, magnetic bead endpoint detection (Coaguchek S®)

Remarks:
 Venipuncture samples may be collected using only plastic syringes. Glass tubes or syringes may not be used.

See Coaguchek procedure for proper fingerstick sample collection technique

Amount to Collect:
 One drop

Sample Type:
 Capillary (fingerstick) blood (venous whole blood acceptable)

Preferred Volume:
 One drop
Minimum Volume:  
10 µL

Units:  
INR

Reference Interval:  
Normal (untreated): 0.9-1.2

Critical Values:  
An INR > 5.0 must be confirmed with a Prothrombin Time performed in the Clinical Laboratory

Synonyms:  
- PT
- coumadin
- warfarin

Additional Information:  
The CoaguChek should not be used with patients having the following conditions:
  a. Lupus anticoagulant
  b. Triglyceride > 500
  c. Bilirubin > 20
  d. On heparin therapy within the last 24 hours.
  e. Hematocrit < 30 or > 52.

Collect only the first drop of blood from a fingerstick. The second drop of blood may have begun the clotting process.

Plasma and serum are not acceptable for testing.

The minimum volume is 10 uL. Low sample volume will cause ERROR display.

Do not attempt to add more blood to the test strip after testing has begun. Repeat test with a new fingerstick and equipment.

If the patient is on intravenous infusion therapy, do not collect the sample from the same arm.

The CoaguChek S monitor, test strips, and Code Chip operate on magnetic principles. It is important to keep these items away from magnetic materials and magnetic fields. Magnetic fields will erase the calibration information on the Code Chip.
POCT Respiratory Syncytial Virus antigen

ORDERING

Available Stat: 
Yes
Performing Lab: 
Authorized Point of Care testing site staff
Performed: 
During clinic hours
Methodology: 
Immunochromographic
Additional Information:
A negative test result does not exclude infection with RSV nor is it intended to rule out other microbial-caused respiratory infections.
The Binax RSV test detects viable and non-viable RSV. Test performance depends on antigen load in the specimen and may not correlate with cell culture performed on the same specimen.
Inadequate specimen collection or low levels of virus shedding may result in sub-optimal performance and may yield false negative results.
Binax test performance has not been evaluated in patients who have been treated with palivizumab. However, an analytical study has demonstrated that palivizumab interferes with the ability of the Binax RSV Test to detect RSV.
The potential for interference from anti-microbials and interferon has not been established.
Monoclonal antibodies may not detect all antigenic variants or new strains of RSV.
Synonyms:
- RSV

COLLECTION

Sample Type: 
Nasal swab or nasal wash
Remarks:
Nasopharyngeal Swabs: 
Polyester, rayon, foam or cotton swabs, all with flexible shafts, may be used to collect the specimen. Add swab specimens to 0.5-3.0 ml of saline immediately after collection, rolling swab in the solution to elute sample.
Nasal Washes: 
Collect nasal wash samples in standard collection cups. Use procedures appropriate for the age of the patient. Nasal washes do not need additional preparation.
Stability (from collection to initiation): 
Samples should be tested as soon as possible after collection.

PROCESSING

Test Group: 
RSV
Performing Lab: 
Authorized Point of Care testing site staff
Stability (from collection to initiation): 
Samples should be tested as soon as possible after collection.

RESULT INTERPRETATION
Reference Interval:
Negative

Additional Information:
A negative test result does not exclude infection with RSV nor is it intended to rule out other microbial-caused respiratory infections.

The Binax RSV test detects viable and non-viable RSV. Test performance depends on antigen load in the specimen and may not correlate with cell culture performed on the same specimen.

Inadequate specimen collection or low levels of virus shedding may result in sub-optimal performance and may yield false negative results.

Binax test performance has not been evaluated in patients who have been treated with palivisumab. However, an analytical study has demonstrated that palivisumab interferes with the ability of the Binax RSV Test to detect RSV.

The potential for interference from anti-microbials and interferon has not been established.

Monoclonal antibodies may not detect all antigenic variants or new strains of RSV.

**Available Stat:**
Yes

**Test Group:**
RSV

**Performing Lab:**
Authorized Point of Care testing site staff

**Performed:**
During clinic hours

**Methodology:**
Immunochromographic

**Remarks:**

**Nasopharyngeal Swabs:**
Polyester, rayon, foam or cotton swabs, all with flexible shafts, may be used to collect the specimen. Add swab specimens to 0.5-3.0 ml of saline immediately after collection, rolling swab in the solution to elute sample.

**Nasal Washes:**
Collect nasal wash samples in standard collection cups. Use procedures appropriate for the age of the patient. Nasal washes do not need additional preparation.

**Sample Type:**
Nasal swab or nasal wash

**Reference Interval:**
Negative

**Synonyms:**
- RSV

**Stability (from collection to initiation):**
Samples should be tested as soon as possible after collection.

**Additional Information:**
A negative test result does not exclude infection with RSV nor is it intended to rule out other microbial-caused respiratory infections.

The Binax RSV test detects viable and non-viable RSV. Test performance depends on antigen load in the specimen and may not correlate with cell culture performed on the same specimen.

Inadequate specimen collection or low levels of virus shedding may result in sub-optimal performance and may yield false negative results.

Binax test performance has not been evaluated in patients who have been treated with palivisumab. However, an analytical study has demonstrated that palivisumab interferes with the ability of the Binax RSV Test to detect RSV.

The potential for interference from anti-microbials and interferon has not been established.
Monoclonal antibodies may not detect all antigenic variants or new strains of RSV.
POCT Streptococcus Group A Antigen

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<tr>
<th>RESULT INTERPRETATION</th>
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Reference Interval:
Negative

Additional Information:
Note that regulations require that all negative rapid tests be follow-up by culture to avoid false negatives.

The accuracy of the test depends on the quality of the swab sample. False negatives may result from improper sample collection or storage. A negative result may be obtained from patient at the onset of the disease due to low antigen concentration.

The test does not differentiate asymptomatic carriers of Group A Streptococcus from those with infection. If clinical signs and symptoms are not consistent with laboratory test results, a follow up throat culture is recommended.

Respiratory infections, including pharyngitis, can be caused by streptococci from serogroups other than group A, as well as other pathogens.

In rare cases, test specimens that are heavily colonized by Staphylococcus aureus may show a very thin sharp line in the test region. This line is unlike the thick line seen with the positive control and other Group A streptococcal strains. If clinical signs and symptoms are not consistent with clinical test result, a follow-up culture should be performed.

It is not known how the device (test) will perform in the presence of Fusobacterium necrophorum.

A definitive clinical diagnosis should not be based on the results of a single test, but should only be made by a physician after all clinical and laboratory findings have been evaluated

Available Stat:
Yes

Test Group:
Streptococcus

Performing Lab:
Authorized Point of Care testing site staff

Performed:
During clinic hours

Methodology:
Two-site sandwich EIA (Signify Strep A)

Remarks:
Use sterile polyester swab to collect sample.

Note: in order to provide a samples for culture should it be needed it is recommended that two swabs be collected. The sample for culture should be submitted in charcoal transport media to maintain viability on non-streptococcal organisms that may also cause pharyngitis.

Sample Type:
Swab of posterior nasopharynx

Reference Interval:
Negative

Synonyms:
- Beta-hemolytic Strep
- beta-strep

Additional Information:
Note that regulations require that all negative rapid tests be follow-up by culture to avoid false negatives.

The accuracy of the test depends on the quality of the swab sample. False negatives may result from improper sample collection or storage. A negative result may be obtained from patient at the onset of the disease due to low antigen concentration.

The test does not differentiate asymptomatic carriers of Group A Streptococcus from those with infection. If clinical signs and symptoms are not consistent with laboratory test results, a follow up throat culture is recommended.

Respiratory infections, including pharyngitis, can be caused by streptococci from serogroups other than group A, as well as other pathogens.
In rare cases, test specimens that are heavily colonized by Staphylococcus aureus may show a very thin sharp line in the test region. This line is unlike the thick line seen with the positive control and other Group A streptococcal strains. If clinical signs and symptoms are not consistent with clinical test result, a follow-up culture should be performed.

It is not known how the device (test) will perform in the presence of Fusobacterium necrophorum.

A definitive clinical diagnosis should not be based on the results of a single test, but should only be made by a physician after all clinical and laboratory findings have been evaluated.
POCT Urine Pregnancy < 18 years old

ORDERING

Available Stat:
Yes

Performing Lab:
Authorized Point of Care testing site staff

Performed:
Test available 24 hours per day 7 days per week

Methodology:
EIA (Mainline Confirms)

Additional Information:
A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Synonyms:
• HCG
• Beta-HCG
• β-HCG
• gonadotropin tests
• Human chorionic gonadotropin

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
10 mL

Preferred Volume:
10 mL urine

Minimum Volume:
1 mL urine

Remarks:
First morning void preferred

PROCESSING

Test Group:
HCG

Performing Lab:
Authorized Point of Care testing site staff

Preferred Volume:
10 mL urine
**Minimum Volume:**

1 mL urine

**RESULT INTERPRETATION**

**Reference Interval:**

Negative (non-pregnant)

**Additional Information:**

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

**COMPLETE VIEW**

**Available Stat:**

Yes

**Test Group:**

HCG

**Performing Lab:**

Authorized Point of Care testing site staff

**Performed:**

Test available 24 hours per day 7 days per week

**Methodology:**

EIA (Mainline Confirms)

**Remarks:**

First morning void preferred

**Collect:**

Urine cup

**Amount to Collect:**

10 mL

**Sample Type:**

Random urine

**Preferred Volume:**

10 mL urine

**Minimum Volume:**

1 mL urine

**Reference Interval:**

Negative (non-pregnant)

**Synonyms:**

- HCG
- Beta-HCG
- b-HCG
- gonadotropin tests
- Human chorionic gonadotropin

**Additional Information:**

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.
If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.
POCT Urine Pregnancy  18 years old

ORDERING

Approval Required:
No
Available Stat:
Yes
Performing Lab:
Authorized Point of Care testing site staff
Performed:
Test available 24 hours per day 7 days per week
Methodology:
EIA (Mainline Confirms)
Additional Information:
A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

Synonyms:
• HCG
• Beta-HCG
• b-HCG
• gonadotropin tests
• Human chorionic gonadotropin

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
10 mL
Preferred Volume:
10 mL urine
Minimum Volume:
1 mL urine
Remarks:
First morning void preferred

PROCESSING

Test Group:
HCG
Performing Lab:
Authorized Point of Care testing site staff
Preferred Volume:
10 mL urine

Minimum Volume:
1 mL urine

RESULT INTERPRETATION

Reference Interval:
Negative (non-pregnant)

Additional Information:
A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

ADMINISTRATIVE

LDT or Modified FDA:
No

COMPLETE VIEW

Approval Required:
No

Available Stat:
Yes

Test Group:
HCG

Performing Lab:
Authorized Point of Care testing site staff

Performed:
Test available 24 hours per day 7 days per week

Methodology:
EIA (Mainline Confirms)

Remarks:
First morning void preferred

Collect:
Urine cup

Amount to Collect:
10 mL

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Minimum Volume:
1 mL urine

Reference Interval:
Negative (non-pregnant)

Synonyms:
• HCG
• Beta-HCG
• b-HCG
• gonadotropin tests
• Human chorionic gonadotropin

Additional Information:

A number of conditions other than pregnancy, including trophoblastic disease and certain nontrophoblastic neoplasms, cause elevated levels of hCG. These diagnoses should be considered if appropriate to the clinical evidence.

If a urine specimen is too diluted (low specific gravity), it may not contain representative levels of hCG. If pregnancy is suspected, ask the patient to collect first morning urine 48 to 72 hours later and repeat the test.

Because of the high sensitivity of the assay, specimens tested as positive during the initial days after conception may later be negative due to natural termination of the pregnancy.

A definitive clinical diagnosis should not be based on the results of a single test but should be made by the physician after evaluation. Blood specimens may be sent to the Clinical Laboratories for confirmatory testing.

LDT or Modified FDA:

No
POCT, Whole Blood Oximetry
AVOXPC

ORDERING

Performing Lab:
Point of Care
Methodology:
AVOX
Additional Information:
The POCT, Whole Blood Oximetry test battery is composed of two components: Oxyhemoglobin Saturation (HBO2AV) and Total Hemoglobin (CAHBAV).
Synonyms:
- AVOX
- %HbO2 Saturation
- Oxyhemoglobin saturation
- Total Hemoglobin

COLLECTION

Sample Type:
Whole Blood
Collect:
Sodium or Lithium Heparin Plastic Syringe
Amount to Collect:
2 mL
Preferred Volume:
2 mL
Minimum Volume:
1 mL
Remarks:
Whole blood samples collected from arterial line, arterial puncture, or venipuncture
Rejection Criteria:
Use of citrate, fluoride oxalate, and excessive volumes of anticoagulant

PROCESSING

Test Code:
AVOXPC (battery components: HBO2AV, CAHBAV)
Performing Lab:
Point of Care
Preferred Volume:
2 mL
Minimum Volume:
1 mL
Rejection Criteria:
Use of citrate, fluoride oxalate, and excessive volumes of anticoagulant

RESULT INTERPRETATION

Units:
Oxyhemoglobin Saturation: %
Total Hemoglobin: g/dL
Reference Interval:
- Oxyhemoglobin Saturation: 95-99%

Total Hemoglobin:
- 0-7 days: 14.5-22.5 g/dL
- 8-14 days: 13.5-21.5 g/dL
- 2-4 weeks: 12.5-20.5 g/dL
- 1-2 mos: 10.0-18.0 g/dL
- 2-3 mos: 9.0-14.0 g/dL
- 3-6 mos: 9.5-13.5 g/dL
- 6-24 mos: 11.0-13.5 g/dL
- 2-5 years: 11.2-13.5 g/dL
- 5-8 years: 11.4-15.5 g/dL
- 8-12 years: 11.6-15.5 g/dL
- Male 12-15 years: 12.3-16.0 g/dL
- Male 15-18 years: 12.6-17.0 g/dL
- Male 18+ years: 13.6-17.5 g/dL
- Female 12-15 years: 11.8-15.5 g/dL
- Female 15+ years: 12.0-15.5 g/dL

Critical Values:
- Total Hemoglobin: < 7.0 g/dL

Additional Information:
The POCT, Whole Blood Oximetry test battery is composed of two components: Oxyhemoglobin Saturation (HBO2AV) and Total Hemoglobin (CAHBAV).

**ADMINISTRATIVE**

**LOINC Codes:**
- HBO2AV: 11559-2
- CAHBAV: 55782-7

**COMPLETE VIEW**

**Test Code:**
- AVOXPC (battery components: HBO2AV, CAHBAV)

**Performing Lab:**
- Point of Care

**Methodology:**
- AVOX

**Remarks:**
- Whole blood samples collected from arterial line, arterial puncture, or venipuncture

**Collect:**
- Sodium or Lithium Heparin Plastic Syringe

**Amount to Collect:**
- 2 mL

**Sample Type:**
- Whole Blood

**Preferred Volume:**
- 2 mL

**Minimum Volume:**
- 1 mL

**Rejection Criteria:**
- Use of citrate, fluoride oxalate, and excessive volumes of anticoagulant

**Units:**
- Oxyhemoglobin Saturation: %
- Total Hemoglobin: g/dL
Reference Interval:

Oxyhemoglobin Saturation: 95-99%

Total Hemoglobin:
0-7 days: 14.5-22.5 g/dL
8-14 days: 13.5-21.5 g/dL
2-4 weeks: 12.5-20.5 g/dL
1-2 mos: 10.0-18.0 g/dL
2-3 mos: 9.0-14.0 g/dL
3-6 mos: 9.5-13.5 g/dL
6-24 mos: 11.0-13.5 g/dL
2-5 years: 11.2-13.5 g/dL
5-8 years: 11.4-15.5 g/dL
8-12 years: 11.6-15.5 g/dL

Male 12-15 years: 12.3-16.0 g/dL
Male 15-18 years: 12.6-17.0 g/dL
Male 18+ years: 13.6-17.5 g/dL

Female 12-15 years: 11.8-15.5 g/dL
Female 15+ years: 12.0-15.5 g/dL

Critical Values:

Total Hemoglobin: < 7.0 g/dL

Synonyms:
- AVOX
- %HbO2 Saturation
- Oxyhemoglobin saturation
- Total Hemoglobin

Additional Information:

The POCT, Whole Blood Oximetry test battery is composed of two components: Oxyhemoglobin Saturation (HBO2AV) and Total Hemoglobin (CAHBAV).

LOINC Codes:

HBO2AV: 11559-2
CAHBAV: 55782-7
Poliovirus Antibodies

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
CF
Reported:
Run Monday and Thursday, Turnaround 2-4 days.
Additional Information:
Used for assessing response to immunization only. Types 1-3 are tested.

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

PROCESSING

Test Code:
POLIO
Test Group:
Poliovirus Antibodies
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Refrigerate separated serum. Order Quest # 988X.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative titer < 8
Additional Information:
Used for assessing response to immunization only. Types 1-3 are tested.
ADMINISTRATIVE

CPT Codes:
86382-90

LOINC Codes:
27261-7

COMPLETE VIEW

Available Stat:
No

Test Code:
POLIO

Test Group:
Poliovirus Antibodies

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
CF

Collect:
Gold top, Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate separated serum. Order Quest # 988X.

Reference Interval:
Negative titer < 8

Reported:
Run Monday and Thursday, Turnaround 2-4 days.

Additional Information:
Used for assessing response to immunization only. Types 1-3 are tested.

CPT Codes:
86382-90

LOINC Codes:
27261-7
Porphyribilinogen deaminase, RBC
UPGS

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Enzymatic endpoint/Spectrofluorometric
Reported:
5-7 days
Synonyms:
- PBG deaminase
- PBG-D
- Erythrocyte Porphobilinogen deaminase

COLLECTION

Patient Preparation:
Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to collection.

Note: The patient should be off medications for 1 week. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.

Sample Type:
Heparinized whole blood
Collect:
Dark Green top on ice
Amount to Collect:
5 mL blood
Preferred Volume:
5 mL blood
Minimum Volume:
5 mL blood
Remarks:
Draw a full, Dark green-top (Sodium Heparin) tube, and send specimen on wet ice to lab immediately.

Draw specimen Monday-Thursday by noon only.

Rejection Criteria:
Sample not received by Mayo within 48 hours of collection. Frozen sample.

PROCESSING

Test Code:
UPGS
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.
Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. **DO NOT** freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample **REFRIGERATED** to Mayo Labs.

Order Mayo test #88925.

**Preferred Volume:**
- 5 mL blood

**Minimum Volume:**
- 5 mL blood

**Rejection Criteria:**
- Sample not received by Mayo within 48 hours of collection. Frozen sample.

### RESULT INTERPRETATION

**Units:**
- nmol/L/sec

**Reference Interval:**
- Normal: > 6.9 nmol/L/sec
- Indeterminate: 6.0-6.9 nmol/L/sec
- Decreased: < 6.0 nmol/L/sec

### ADMINISTRATIVE

**CPT Codes:**
- 82657-90

**LOINC Codes:**
- 2812-6

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- UPGS

**Performing Lab:**
- Mayo

**Sendout:**
- Yes

**Methodology:**
- Enzymatic endpoint/Spectrofluorometric

**Patient Preparation:**
- Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to collection.

- Note: The patient should be off medications for 1 week. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.

**Remarks:**
- Draw a full, Dark green-top (Sodium Heparin) tube, and send specimen on wet ice to lab immediately.

- Draw specimen Monday-Thursday by noon only.

**Collect:**
- Dark Green top on ice

**Amount to Collect:**
- 5 mL blood

**Sample Type:**
- Heparinized whole blood
Preferred Volume:  
5 mL blood

Minimum Volume:  
5 mL blood

Rejection Criteria:  
Sample not received by Mayo within 48 hours of collection. Frozen sample.

Specimen Preparation:  
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.

Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. DO NOT freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample REFRIGERATED to Mayo Labs.

Order Mayo test #88925.

Units:  
nmol/L/sec

Reference Interval:  
Normal: > 6.9 nmol/L/sec  
Indeterminate: 6.0-6.9 nmol/L/sec  
Decreased: < 6.0 nmol/L/sec

Synonyms:  
- PBG deaminase  
- PBG-D  
- Erythrocyte Porphobilinogen deaminase

Reported:  
5-7 days

CPT Codes:  
82657-90

LOINC Codes:  
2812-6
Porphobilinogen, Quantitative, 24 hour urine
PBQT24

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Colorimetric
Reported:
Test performed Monday-Friday. Turnaround time: 2-3 days.
Additional Information:
To convert mg/d to µmol/d (SI units) multiply by 4.420.
This test should almost always be ordered in conjunction with Aminolevulinic Acid (ALA) analysis on same specimen when the diagnosis of Acute Intermittent Porphyria is being considered.
Synonyms:
• PBG
• Porphyrin precursors
• Porphyria

COLLECTION

Sample Type:
24 hour urine collection
Collect:
Brown 24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Remarks:
IMPORTANT: Refrigerate container and protect from light (place in brown paper bag or wrap with aluminum foil) during and after collection.
Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20C 1 month
Unacceptable Conditions:
Container not refrigerated or protected from light during collection. Urine pH < 4.0

PROCESSING

Test Code:
PBQT24
Test Group:
Porphobilinogen
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze aliquot in dark pour-off container [or wrap container in aluminum foil at -20C. Record total urine volume on the request slip and on the urine container. Order Quest # 762.

**Preferred Volume:**
- 10 mL urine

**Minimum Volume:**
- 2 mL urine

**Unacceptable Conditions:**
- Container not refrigerated or protected from light during collection. Urine pH < 4.0

**Stability (from collection to initiation):**
- Refrigerated 1 week, frozen at -20C 1 month

**RESULT INTERPRETATION**

**Units:**
- mg/24 h

**Reference Interval:**
- <2.8 mg/d

**Additional Information:**
- To convert mg/d to µmol/d (SI units) multiply by 4.420.

This test should almost always be ordered in conjunction with Aminolevulinic Acid (ALA) analysis on same specimen when the diagnosis of Acute Intermittent Porphyria is being considered.

**ADMINISTRATIVE**

**CPT Codes:**
- 84110-90

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- PBQT24

**Test Group:**
- Porphobilinogen

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Colorimetric

**Remarks:**
- IMPORTANT: Refrigerate container and protect from light (place in brown paper bag or wrap with aluminum foil) during and after collection.

**Collect:**
- Brown [24 hour urine collection container](#)

**Amount to Collect:**
- Entire 24 hour urine output

**Sample Type:**
- 24 hour urine collection

**Preferred Volume:**
- 10 mL urine

**Minimum Volume:**
- 2 mL urine
Unacceptable Conditions:
   Container not refrigerated or protected from light during collection. Urine pH < 4.0

Specimen Preparation:
   Freeze aliquot in dark pour-off container [or wrap container in aluminum foil at -20C. Record total urine volume on the request slip and on the urine container. Order Quest # 762.

Units:
   mg/24 h

Reference Interval:
   <2.8 mg/d

Synonyms:
   • PBG
   • Porphyrin precursors
   • Porphyria

Stability (from collection to initiation):
   Refrigerated 1 week, frozen at -20C 1 month

Reported:
   Test performed Monday-Friday. Turnaround time: 2-3 days.

Additional Information:
   To convert mg/d to µmol/d (SI units) multiply by 4.420.

   This test should almost always be ordered in conjunction with Aminolevulinic Acid (ALA) analysis on same specimen when the diagnosis of Acute Intermittent Porphyria is being considered.

CPT Codes:
   84110-90
Porphobilinogen, Quantitative, random urine

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Colorimetric
Reported:
Set up 5x per week. Turnaround 3-5 days
Additional Information:

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Porphobilinogen Increased?**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute intermittent porphyria</td>
<td>+</td>
</tr>
<tr>
<td>ALA dehydratase deficiency porphyria</td>
<td>+</td>
</tr>
<tr>
<td>Congenital erythropoietic coproporphyia</td>
<td>-</td>
</tr>
<tr>
<td>Erythropoietic protoporphyrria</td>
<td>-</td>
</tr>
<tr>
<td>Hepatoerythropoietic porphyria</td>
<td>-</td>
</tr>
<tr>
<td>Hereditary coproporphyria</td>
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<td>Porphyria cutanea tarda</td>
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<tr>
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** Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or environmental factors.

Synonyms:
- PBG
- Porphyrin precursors
- Porphyria

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup, wrap with foil to protect from light.
Amount to Collect:
10 mL
Preferred Volume:
10 mL urine
Minimum Volume:
2 mL urine
Remarks:
Collect random urine, wrap collection cup in aluminum foil to protect sample from light. Transport asap to laboratory for processing. If transport delayed the sample should be refrigerated.
Stability (from collection to initiation):
Room temperature not acceptable, refrigerated 1 week, frozen at -20C 1 month.
Unacceptable Conditions:
Sample was not protected from light.

PROCESSING

Test Code:
PBQTRU
Test Group:
  Porphobilinogen
Sendout:
  Yes
Performing Lab:
  Quest
Specimen Preparation:
  Do not use preservatives. Aliquot to dark pour off tube or wrap with aluminum foil to protect from light. Freeze at -20C and ship frozen on dry ice.
Preferred Volume:
  10 mL urine
Minimum Volume:
  2 mL urine
Unacceptable Conditions:
  Sample was not protected from light.
Stability (from collection to initiation):
  Room temperature not acceptable, refrigerated 1 week, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
  mg/g creatinine
Reference Interval:
  1-8 years: 0.9-2.8 mg/g creatinine
  9-17 years: 0.5-2.0 mg/g creatinine
  >= 18 years: <= 1.5 mg/g creatinine
Additional Information:

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** Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or environmental factors.

ADMINISTRATIVE

CPT Codes:
  84110-90
LOINC Codes:
  13797-6

COMPLETE VIEW

Available Stat:
  No
Test Code:
  PBQTRU
Test Group:
Porphobilinogen

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Colorimetric

**Remarks:**
Collect random urine, wrap collection cup in aluminum foil to protect sample from light. Transport asap to laboratory for processing. If transport delayed the sample should be refrigerated.

**Collect:**
Urine cup, wrap with foil to protect from light.

**Amount to Collect:**
10 mL

**Sample Type:**
Random urine

**Preferred Volume:**
10 mL urine

**Minimum Volume:**
2 mL urine

**Unacceptable Conditions:**
Sample was not protected from light.

**Specimen Preparation:**
Do not use preservatives. Aliquot to dark pour off tube or wrap with aluminum foil to protect from light. Freeze at -20C and ship frozen on dry ice.

**Units:**
mg/g creatinine

**Reference Interval:**
- 1-8 years: 0.9-2.8 mg/g creatinine
- 9-17 years: 0.5-2.0 mg/g creatinine
- >= 18 years: <= 1.5 mg/g creatinine

**Synonyms:**
- PBG
- Porphyrin precursors
- Porphyria

**Stability (from collection to initiation):**
Room temperature not acceptable, refrigerated 1 week, frozen at -20C 1 month.

**Reported:**
Set up 5x per week. Turnaround 3-5 days

**Additional Information:**

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**Patients with hereditary forms of porphyria usually will present with profound elevations of this analyte (> 5-fold) during acute episodes. Moderate elevations (< 3-fold) are more often due to medications or environmental factors.**

**CPT Codes:**
84110-90

**LOINC Codes:**

Printed 06/07/19
Test information subject to change
Porphyrians Evaluation, RBC
EPQTS

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Spectrofluorometric, HPLC
Reported:
Test run Monday-Friday. Turnaround time: 3-6 days.
Reflex Testing:
For samples with porphyrin &gt;= 80p µg/dL fractionation is automatically performed at an additional charge.
Synonyms:
• Porphyrin fractionation
• RBC porphyrins

COLLECTION

Patient Preparation:
Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to sample collection. The patient should be off medications for at least 1 week prior to sample collection. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.
Sample Type:
Heparinized whole blood
Collect:
Dark Green top on ice
Amount to Collect:
5 mL blood
Preferred Volume:
5 mL blood
Minimum Volume:
3 mL blood
Remarks:
Draw a full, Dk. green top (heparin) tube, and send entire heparinized whole blood specimen on wet ice to lab immediately.

Unacceptable Conditions:
Hemolyzed or collected outside of stated time frames.
Rejection Criteria:
Sample not received by Mayo within 48 hours of collection. Frozen sample.

PROCESSING

Test Code:
EPQTS
Test Group:
Porphyrians
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.

Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. DO NOT freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample REFRIGERATED to Mayo Labs.

Order MAYO #88886. Call MCS for pickup.

Preferred Volume:
5 mL blood

Minimum Volume:
3 mL blood

Unacceptable Conditions:
Hemolyzed or collected outside of stated time frames.

Rejection Criteria:
Sample not received by Mayo within 48 hours of collection. Frozen sample.

RESULT INTERPRETATION

Units:
µg/dL

Reference Interval:
<80 µg/dL

ADMINISTRATIVE

CPT Codes:
82542-90

LOINC Codes:
2814-2

COMPLETE VIEW

Available Stat:
No

Test Code:
EPQTS

Test Group:
Porphyrians

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Spectrofluorometric, HPLC

Patient Preparation:
Have patient fast for 12-14 hours. Water may be taken as needed. No other liquids are allowed. Patient should abstain from alcohol for 24 hours prior to sample collection. The patient should be off medications for at least 1 week prior to sample collection. If clinically inappropriate to discontinue medications, forward a list of medications with the specimen.

Remarks:
Draw a full, Dk. green top (heparin) tube, and send entire heparinized whole blood specimen on wet ice to lab immediately.

Draw specimen Monday-Thursday by noon only.

Collect:
Dark Green top on ice

Amount to Collect:
5 mL blood

**Sample Type:**
Heparinized whole blood

**Preferred Volume:**
5 mL blood

**Minimum Volume:**
3 mL blood

**Rejection Criteria:**
Sample not received by Mayo within 48 hours of collection. Frozen sample.

**Unacceptable Conditions:**
Hemolyzed or collected outside of stated time frames.

**Specimen Preparation:**
Whole Blood to be washed at Mayo Medical Laboratories. Specimen must arrive within 48 hours of draw.

Place green top on wet ice and forward whole blood to China Basin for MCI courier pickup at 1600 hours. **DO NOT** freeze sample.

Notify sendout at 3-1349 that specimen is en-route. Mark sample REFRIGERATED to Mayo Labs.

Order MAYO #88886. Call MCS for pickup.

**Units:**
µg/dL

**Reference Interval:**
<80 µg/dL

**Synonyms:**
- Porphyrin fractionation
- RBC porphyrins

**Reported:**
Test run Monday-Friday. Turnaround time: 3-6 days.

**Reflex Testing:**
For samples with porphyrin >= 80p µg/dL fractionation is automatically performed at an additional charge.

**CPT Codes:**
82542-90

**LOINC Codes:**
2814-2
Porphyrians, Fecal
MOLT

ORDERING

Ordering Recommendations:
Distinguish among acute intermittent porphyria (AIP), variegate porphyria (VP), and hereditary coproporphyria (HCP).

Performed:
Mon, Thu

Methodology:
Quantitative High Performance Liquid Chromatography

Reported:
2-7 days

Synonyms:
- Coproporphyrin
- Coproporphyrins
- Isocoproporphyrins
- Protoporphyrin

COLLECTION

Collect:
Random stool.

Stability (from collection to initiation):
- Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 3 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Complete timed collections (24-72 hour). Specimens stored in one gallon cans or other large containers. Liquid stool.

PROCESSING

Test Code:
MOLT

ARUP Test Code:
0099824

Specimen Preparation:
Protect from light during collection, storage, and shipment. Freeze specimen and wrap in foil immediately after collection. Transport 5 g stool. (Min: 1 g)

Unacceptable Conditions:
Complete timed collections (24-72 hour). Specimens stored in one gallon cans or other large containers. Liquid stool.

Stability (from collection to initiation):
- Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 3 weeks

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coproporphyrin, Feces</td>
<td>0-45 nmol/g dry weight</td>
</tr>
<tr>
<td>Protoporphyrin, Feces</td>
<td>0-100 nmol/g dry weight</td>
</tr>
</tbody>
</table>

Test information subject to change
Ordering Recommendations:
Distinguish among acute intermittent porphyria (AIP), variegate porphyria (VP), and hereditary coproporphyria (HCP).

Test Code:
MOLT

ARUP Test Code:
0099824

Performed:
Mon, Thu

Methodology:
Quantitative High Performance Liquid Chromatography

Collect:
Random stool.

Unacceptable Conditions:
Complete timed collections (24-72 hour). Specimens stored in one gallon cans or other large containers. Liquid stool.

Specimen Preparation:
Protect from light during collection, storage, and shipment. Freeze specimen and wrap in foil immediately after collection. Transport 5 g stool. (Min: 1 g)

Reference Interval:

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</tr>
</tbody>
</table>

Synonyms:
- Coproporphyrin
- Coproporphyrins
- Isocoproporphyrins
- Protoporphyrin

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 3 weeks

Reported:
2-7 days

CPT Codes:
84126

Notes:
Bacterial modification of fecal porphyrins is extensive. The recommended specimen for uroporphyrin and coproporphyrin is urine (random or 24-hour). Refer to Porphyrins, Fractionation & Quantitation, Urine (ARUP test code 2002058). The recommended specimen for protoporphyrin is serum. Refer to Porphyrins, Serum Total (ARUP test code 0080429).
Porphyryns, fractionated, random urine
PORFUR

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test set up 5x per week, Turnaround 5-7 days
Synonyms:
• Porphyria

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Remarks:
Collect urine in plastic cup, wrap with aluminum foil to protect from light.

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

Unacceptable Conditions:
Received at room temperature, not protected from light.
Rejection Criteria:
Received at room temperature, not protected from light, pH < 4.0 when rec'd at Quest.

PROCESSING

Test Code:
PORFUR
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Protect specimen from light, aliquot urine into dark brown specimen vial or wrap in foil. Freeze aliquot and submit to China Basin sendout, order Quest test #36592X.
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine

Unacceptable Conditions:
Received at room temperature, not protected from light.

Rejection Criteria:
Received at room temperature, not protected from light, pH < 4.0 when rec'd at Quest.

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month
Note samples must be protected from light

RESULT INTERPRETATION

Units:
µg/g creatinine (mcg/g creatinine)

Reference Interval:
Uroporphyrin:
1-10 years  4.3-16.2 mcg/g creatinine
11-17 years 4.6-18.9 mcg/g creatinine
>= 18 years 22.0 or less mcg/g creatinine

Heptacarboxyporphyrin:
>= 1 year 4.6 or less mcg/g creatinine

Hexacarboxyporphyrin:
[>= 1 year] [NOT DETECTED]

Pentacarboxyporphyrin:
1-10 years  3.2 or less mcg/g creatinine
11-17 years 3.0 or less mcg/g creatinine
>= 18 years 1.7 or less mcg/g creatinine

Coproporphyrin:
1-10 years  10.1-254.7 mcg/g creatinine
11-17 years 11.8-107.2 mcg/g creatinine
>= 18 years 23.0-130.0 mcg/g creatinine

Total Porphyrins:
1-10 years  17.0-269.7 mcg/g creatinine
11-17 years 16.4-121.5 mcg/g creatinine
>= 18 years 31.0-139.0 mcg/g creatinine

ADMINISTRATIVE

CPT Codes:
84120-90

COMPLETE VIEW

Available Stat:
No
Test Code:
PORFUR
Performing Lab:
Quest
Sendout:
Yes
Methodology:
   HPLC
Remarks:
   Collect urine in plastic cup, **wrap with aluminum foil to protect from light.**
   Transport sample asap to laboratory, if transport is delayed refrigerate the sample.
Collect:
   Urine cup
Amount to Collect:
   20 mL urine
Sample Type:
   Random urine
Preferred Volume:
   2 mL urine
Minimum Volume:
   1 mL urine
Rejection Criteria:
   Received at room temperature, not protected from light, pH < 4.0 when rec'd at Quest.
Unacceptable Conditions:
   Received at room temperature, not protected from light.
Specimen Preparation:
   Protect specimen from light, aliquot urine into dark brown specimen vial or wrap in foil . Freeze aliquot and submit to China Basin sendout , order Quest test #36592X.
Units:
   µg/g creatinine (mcg/g creatinine)
Reference Interval:
   **Uroporphyrin:**
   1-10 years 4.3-16.2 mcg/g creatinine
   11-17 years 4.6-18.9 mcg/g creatinine
   >=18 years 22.0 or less mcg/g creatinine
   **Heptacarboxyporphyrin:**
   >=1 year 4.6 or less mcg/g creatinine
   **Hexacarboxyporphyrin:**
   >=1 year NOT DETECTED
   **Pentacarboxyporphyrin:**
   1-10 years 3.2 or less mcg/g creatinine
   11-17 years 3.0 or less mcg/g creatinine
   >=18 years 1.7 or less mcg/g creatinine
   **Coproporphyrin:**
   1-10 years 10.1-254.7 mcg/g creatinine
   11-17 years 11.8-107.2 mcg/g creatinine
   >=18 years 23.0-130.0 mcg/g creatinine
   **Total Porphyrins:**
   1-10 years 17.0-269.7 mcg/g creatinine
   11-17 years 16.4-121.5 mcg/g creatinine
   >=18 years 31.0-139.0 mcg/g creatinine
Synonyms:
   • Porphyria
Stability (from collection to initiation):
   Refrigerated 1 week, frozen 1 month
   Note samples must be protected from light
Reported:
Test set up 5x per week, Turnaround 5-7 days

**CPT Codes:**
84120-90
Porphyruins, Fractionated, Urine
PORFU

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test run Monday-Friday. Turnaround time: 3-6 days.
Additional Information:
To convert µg/d to nmol/d (SI units) multiply TetraCP by 1.53, PentaCP by 1.44, HexaCP by 1.36, HeptaCP by 1.28, OctaCP by 1.20.
To convert mg/d of Porphobilinogen to µmol/d (SI units) multiply by 4.42.
Synonyms:
- Porphyria

COLLECTION

Sample Type:
24 hour urine collection
Collect:
Brown 24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Remarks:
IMPORTANT: Refrigerate container and protect from light (place in brown paper bag or wrap with aluminum foil) during and after collection.

Note: This assay does not include urinary porphobilinogen which, if desired, must be ordered separately.
Unacceptable Conditions:
Container not refrigerated or protected from light during collection.

PROCESSING

Test Code:
PORFU
Test Group:
Porphyruins
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate aliquot in a foil-wrapped vial and record the total volume of the collection on the request slip and the transport vial. Order Quest # 729X
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine

Unacceptable Conditions:
Container not refrigerated or protected from light during collection.

RESULT INTERPRETATION

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:
- Tetracarboxylporphyrins (Coproporphyrins) <= 155 µg/d
- Pentacarboxylporphyrins <= 4.7 µg/d
- Hexacarboxylporphyrins <= 0.9 µg/d
- Heptacarboxylporphyrins <= 6.8 µg/d
- Octacarboxylporphyrins (Uroporphyrins) 3.3-29.5 µg/d
- Total porphyrins 12-190 µg/d

Additional Information:
To convert µg/d to nmol/d (SI units) multiply TetraCP by 1.53, PentaCP by 1.44, HexaCP by 1.36, HeptaCP by 1.28, OctaCP by 1.20.
To convert mg/d of Porphobilinogen to µmol/d (SI units) multiply by 4.42.

ADMINISTRATIVE

CPT Codes:
84120-90

LOINC Codes:
43116-3

COMPLETE VIEW

Available Stat:
No

Test Code:
PORFU

Test Group:
Porphyrs

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Remarks:
IMPORTANT: Refrigerate container and protect from light (place in brown paper bag or wrap with aluminum foil) during and after collection.

Note: This assay does not include urinary porphobilinogen which, if desired, must be ordered separately.

Collect:
Brown 24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Unacceptable Conditions:
Container not refrigerated or protected from light during collection.

Specimen Preparation:
Refrigerate aliquot in a foil-wrapped vial and record the total volume of the collection on the request slip and the transport vial. Order Quest # 729X

Units:
µg/24 hours (mcg/24 hours)

Reference Interval:

- Tetracarboxylporphyrins (Coproporphyrins) <= 155 µg/d
- Pentacarboxylporphyrins <= 4.7 µg/d
- Hexacarboxylporphyrins <= 0.9 µg/d
- Heptacarboxylporphyrins <= 6.8 µg/d
- Octacarboxylporphyrins (Uroporphyrins) 3.3-29.5 µg/d
- Total porphyrins 12-190 µg/d

Synonyms:
- Porphyria

Reported:
Test run Monday-Friday. Turnaround time: 3-6 days.

Additional Information:
To convert µg/d to nmol/d (SI units) multiply TetraCP by 1.53, PentaCP by 1.44, HexaCP by 1.36, HeptaCP by 1.28, OctaCP by 1.20.
To convert mg/d of Porphobilinogen to µmol/d (SI units) multiply by 4.42.

CPT Codes:
84120-90

LOINC Codes:
43116-3
Posaconazole
PSCA

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Tuesday and Friday AM (excluding holidays)
Methodology:
LC-MS/MS
Reported:
3-4 days.
Additional Information:

Background
Posaconazole is a triazole antifungal agent with potent activity against yeasts and molds. It is proven to be effective in the prophylaxis of invasive fungal infections in immunocompromised patients, and is considered an alternative treatment for zygomycetes, invasive Aspergillus infections, Candida and other infections caused by pathogenic yeasts.

Posaconazole was originally available only as an oral suspension with limited bioavailability. A delayed-release tablet formulation with improved absorption and an intravenous formulation are now available. The oral suspension and delayed-release tablet are not directly interchangeable - consultation with ID pharmacy is strongly recommended if switching between formulations. Posaconazole is an inhibitor of cytochrome P450 3A4 and a substrate of the p-glycoprotein drug transporter.

Indications for Posaconazole TDM

1) Any use of the oral suspension for prolonged (>7 days) use for prophylaxis or treatment.

2) Use of the delayed-release tablet formulation in patients receiving the drug for prophylaxis and with one or more of the following:
- known or suspected gastrointestinal absorption abnormalities
- altered pharmacokinetics
- receipt of other drugs likely to have a significant interaction with posaconazole (e.g. phenytoin, rifabutin, carbamezapine) which cannot be discontinued without an adverse effect on patient care
- experiencing substantial hepatic toxicity (AST/ALT > 5 times upper limit of normal or total bilirubin > 3 mg/dl) while on posaconazole, with other potential causes ruled out.
- If develops concern for breakthrough infection while on prophylaxis

3) Use of the delayed-release tablet formulation or the intravenous formulation when used to treat invasive fungal infections

When trough levels are indicated, samples should be obtained 5-7 days after:
- start of therapy
- change in dose
- change in route of administration
- change in potentially interacting drugs

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Synonyms:
- Posanol, Noxafil

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
2 mL blood
Preferred Volume:  
1 mL serum

Minimum Volume:  
0.3 mL serum

Remarks:  
In most cases, a single trough level of posaconazole should be adequate. This level should be drawn after at least seven days of posaconazole (steady state is 7-10 days) have been administered.

Posaconazole should be administered with food or nutritional supplement. The level should be drawn from 11-12 hours after the previous dose and less than one hour prior to the next dose. Peak levels should only be drawn in special circumstances.

Stability (from collection to initiation):  
Refrigerated: 1 week  
Frozen: 6 months

PROCESSING

Test Code:  
PSCA

Performing Lab:  
China Basin Chemistry

Specimen Preparation:  
Refrigerate serum.

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.3 mL serum

Stability (from collection to initiation):  
Refrigerated: 1 week  
Frozen: 6 months

RESULT INTERPRETATION

Units:  
µg/mL (mcg/mL)

Reference Interval:  
Target Range:  
Adults (>= 18 years old):  
Prophylaxis: steady-state trough >0.7 µg/mL  
Treatment: steady-state trough >1.25 µg/mL

Pediatrics (< 18 years old):  
Prophylaxis: steady-state trough >0.7 µg/mL  
Treatment: steady-state trough >1.0 µg/mL

Insufficient data exists to provide an upper therapeutic range, but patients with trough levels above 5 µg/mL should be reviewed for presence of toxicity

Levels should be re-checked until a result in the therapeutic range is obtained, and after changes in doses/route/interacting drugs. For patients on long-term posaconazole on stable doses, consider checking surveillance levels every 3 months.

References:


Additional Information:

Background
Posaconazole is a triazole antifungal agent with potent activity against yeasts and molds. It is proven to be effective in the prophylaxis of invasive fungal infections in immunocompromised patients, and is considered an alternative treatment for zygomycetes, invasive Aspergillus infections, Candida and other infections caused by pathogenic yeasts.

Posaconazole was originally available only as an oral suspension with limited bioavailability. A delayed-release tablet formulation with improved absorption and an intravenous formulation are now available. The oral suspension and delayed-release tablet are not directly interchangeable - consultation with ID pharmacy is strongly recommended if switching between formulations. Posaconazole is an inhibitor of cytochrome P450 3A4 and a substrate of the p-glycoprotein drug transporter.

Indications for Posaconazole TDM

1) Any use of the oral suspension for prolonged (>7 days) use for prophylaxis or treatment.

2) Use of the delayed-release tablet formulation in patients receiving the drug for prophylaxis and with one or more of the following:
- known or suspected gastrointestinal absorption abnormalities
- altered pharmacokinetics
- receipt of other drugs likely to have a significant interaction with posaconazole (e.g. phenytoin, rifabutin, carbamezapine) which cannot be discontinued without an adverse effect on patient care
- experiencing substantial hepatic toxicity (AST/ALT > 5 times upper limit of normal or total bilirubin > 3 mg/dl) while on posaconazole, with other potential causes ruled out.
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CPT Codes:
80299

LDT or Modified FDA:
Yes

LOINC Codes:
53731-6

COMPLETE VIEW

Available Stat:
No

Test Code:
PSCA

Performing Lab:
China Basin Chemistry

Performed:
Tuesday and Friday AM (excluding holidays)

Methodology:
LC-MS/MS

Remarks:
In most cases, a single trough level of posaconazole should be adequate. This level should be drawn after at least seven days of posaconazole (steady state is 7-10 days) have been administered.

Posaconazole should be administered with food or nutritional supplement. The level should be drawn from 11-12 hours after the previous dose and less than one hour prior to the next dose. Peak levels should only be drawn in special circumstances.

Collect:
Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Refrigerate serum.

Units:
µg/mL (mcg/mL)

Reference Interval:
Target Range:
Adults (>= 18 years old):
Prophylaxis: steady-state trough >0.7 µg/mL
Treatment: steady-state trough >1.25 µg/mL

Pediatrics (< 18 years old):
Prophylaxis: steady-state trough >0.7 µg/mL
Treatment: steady-state trough >1.0 µg/mL

Insufficient data exists to provide an upper therapeutic range, but patients with trough levels above 5 µg/mL should be reviewed for presence of toxicity

Levels should be re-checked until a result in the therapeutic range is obtained, and after changes in doses/route/interacting drugs. For patients on long-term posaconazole on stable doses, consider checking surveillance levels every 3 months.

References:


Synonyms:
- Posanol, Noxafil

Stability (from collection to initiation):
Refrigerated: 1 week
Frozen: 6 months

Reported:
3-4 days.

Additional Information:
Background
Posaconazole is a triazole antifungal agent with potent activity against yeasts and molds. It is proven to be effective in the prophylaxis of invasive fungal infections in immunocompromised patients, and is considered an alternative treatment for zygomycetes, invasive Aspergillus infections, Candida and other infections caused by pathogenic yeasts.

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Indications for Posaconazole TDM

1) Any use of the oral suspension for prolonged (>7 days) use for prophylaxis or treatment.

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CPT Codes:

80299

LDT or Modified FDA:

Yes

LOINC Codes:

53731-6
Post Dialysis BUN, Plasma / Serum

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic conductivity, kinetic (urease)
Reported: STAT 1 hour, Routine 4 hours
Additional Information: To convert mg/dL to mmol/L (SI units) multiply by 0.357.
Synonyms: • Post BUN, BUNPST

COLLECTION

Sample Type: Plasma or serum
Collect: Light green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: BUNPST
Test Group: Urea
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:
8 - 23

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.

CPT Codes:
84520

LOINC Codes:
11064-3

Available Stat:
Yes

Test Code:
BUNPST

Test Group:
Urea

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzymatic conductivity, kinetic (urease)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mg/dL

Reference Interval:
8 - 23

Synonyms:
Post BUN, BUNPST

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.

CPT Codes:
84520

LOINC Codes:
11064-3
**Post-Transfusion Purpura**

**MOLT**

**ORDERING**

Approval Required:
Must be approved by Clinical Hematology Consult Service/Blood Bank.

Available Stat:
No

Performing Lab:
Versiti via Blood Center of Wisconsin

Methodology:
Flow cytometry, ELISA and PCR

Reported:
1-2 weeks

Additional Information:
Post-transfusion purpura may arise from the cross-reaction of antibodies to transfused platelets with the patient's own platelets in the 2% of the general population whose platelets lack the common P1A1 antigen or other less common antigens such as P1A2, Bak and Pen or, more rarely, following the administration of blood products collected from previously sensitized donors. It is most common in multiparous women and in previously transfused patients.

Synonyms:
- P1A1
- P1A2
- Bak
- Pen
- PTP

**COLLECTION**

Sample Type:
EDTA whole blood **AND** serum

Collect:
EDTA Lavender 6 (x2) and Red top (x2)

Amount to Collect:
See Preferred Volume

Preferred Volume:
5-10 ml EDTA Whole Blood (Lavender top) and 10 ml Serum (Red top)

Remarks:
See Information under Approval Req’d before submitting samples
Provider must fill out the outside lab (BCW) requisition form.

[https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf](https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf)

Submit form, APEX MOLT order requisition and specimens to Central Processing
Specimens only accepted 8am-5pm Monday-Thursday, and up to noon on Fridays.

Note: Samples must be received at the Blood Center of Wisconsin within 4 days of draw.

Stability (from collection to initiation):
Samples must be received within 4 days of draw date at the Blood Center of Wisconsin.

Unacceptable Conditions:
Samples collected outside of acceptable time frames.

Rejection Criteria:
Samples > 4 days old when received. Whole blood sample received frozen.
PROCESSING

Test Code:
  MOLT
Sendout:
  Yes
Performing Lab:
  Versiti via Blood Center of Wisconsin
Specimen Preparation:
  Provider must fill out the outside lab (BCW) requisition form.
  https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf
  Submit form, APEX MOLT order requisition and specimens to Central Processing
  Store refrigerated. Send sample refrigerated. Sample must be received within 4 days of draw date.
Preferred Volume:
  5-10 ml EDTA Whole Blood (Lavender top) and 10 ml Serum (Red top)
Unacceptable Conditions:
  Samples collected outside of acceptable time frames.
Rejection Criteria:
  Samples > 4 days old when received. Whole blood sample received frozen.
Stability (from collection to initiation):
  Samples must be received within 4 days of draw date at the Blood Center of Wisconsin.

RESULT INTERPRETATION

Reference Interval:
  Negative
Additional Information:
  Post-transfusion purpura may arise from the cross-reaction of antibodies to transfused platelets with the patient's own platelets in the
  2% of the general population whose platelets lack the common PIA1 antigen or other less common antigens such as PIA2, Bak and Pen
  or, more rarely, following the administration of blood products collected from previously sensitized donors. It is most common in
  multiparous women and in previously transfused patients.

ADMINISTRATIVE

CPT Codes:
  83891-90, 83896-90 x18, 83900-90, 83901-90 x5, 83912-90, 86022-90 x11

COMPLETE VIEW

Approval Required:
  Must be approved by Clinical Hematology Consult Service/Blood Bank.
Available Stat:
  No
Test Code:
  MOLT
Performing Lab:
  Versiti via Blood Center of Wisconsin
Sendout:
  Yes
Methodology:
  Flow cytometry, ELISA and PCR
Remarks:
See Information under Approval Req'd before submitting samples

Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

Specimens only accepted 8am-5pm Monday-Thursday, and up to noon on Fridays.

Note: Samples must be received at the Blood Center of Wisconsin within 4 days of draw.

Collect:

EDTA Lavender 6 (x2) and Red top (x2)

Amount to Collect:

See Preferred Volume

Sample Type:

EDTA whole blood AND serum

Preferred Volume:

5-10 ml EDTA Whole Blood (Lavender top) and 10 ml Serum (Red top)

Rejection Criteria:

Samples > 4 days old when received. Whole blood sample received frozen.

Unacceptable Conditions:

Samples collected outside of acceptable time frames.

Specimen Preparation:

Provider must fill out the outside lab (BCW) requisition form.

https://www.versiti.org/Custom/Files/Versiti/7a/7ab41667-0451-476f-b554-2802fcb05e2c.pdf

Submit form, APEX MOLT order requisition and specimens to Central Processing

Store refrigerated. Send sample refrigerated. Sample must be received within 4 days of draw date.

Reference Interval:

Negative

Synonyms:

- P1A1
- P1A2
- Bak
- Pen
- PTP

Stability (from collection to initiation):

Samples must be received within 4 days of draw date at the Blood Center of Wisconsin.

Reported:

1-2 weeks

Additional Information:

Post-transfusion purpura may arise from the cross-reaction of antibodies to transfused platelets with the patient's own platelets in the 2% of the general population whose platelets lack the common PIA1 antigen or other less common antigens such as PIA2, Bak and Pen or, more rarely, following the administration of blood products collected from previously sensitized donors. It is most common in multiparous women and in previously transfused patients.

CPT Codes:

83891-90,83896-90 x18,83900-90,83901-90 x5, 83912-90,86022-90 x11
### Post-Transfusion Study

**TRXN**

#### ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performing Lab:</strong></td>
<td>Parnassus &amp; Mission Bay Blood Banks</td>
</tr>
<tr>
<td><strong>Performed:</strong></td>
<td>Test available 24 hours per day 7 days per week</td>
</tr>
<tr>
<td><strong>Reported:</strong></td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Synonyms:</strong></td>
<td>Transfusion reaction</td>
</tr>
</tbody>
</table>

#### COLLECTION

| Sample Type: | EDTA whole blood |
| Collect: | Lavender top (6 mL) |
| **Amount to Collect:** | 6 mL blood |
| **Preferred Volume:** | 6 mL blood |
| **Remarks:** | Fill out Transfusion Reaction Report form and send to Blood Bank IMMEDIATELY, together with post-transfusion blood specimens. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample. |
| **Unacceptable Conditions:** | Unsigned, mislabeled or unlabeled sample |

#### PROCESSING

| Test Code: | TRXN |
| **Performing Lab:** | Parnassus & Mission Bay Blood Banks |
| **Preferred Volume:** | 6 mL blood |
| **Unacceptable Conditions:** | Unsigned, mislabeled or unlabeled sample |

#### ADMINISTRATIVE

| CPT Codes: | 86900, 86901, 86880 |

#### COMPLETE VIEW

| Available Stat: | Yes |
| Test Code: | |
Performing Lab:
Parnassus & Mission Bay Blood Banks

Test available 24 hours per day 7 days per week

Remarks:
Fill out Transfusion Reaction Report form and send to Blood Bank IMMEDIATELY, together with post-transfusion blood specimens
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top (6 mL)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

Synonyms:
- Transfusion reaction

Reported:
1 hour

CPT Codes:
86900, 86901, 86880
Potassium, 24 hour (or timed) urine
KUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.
Methodology:
Ion selective electrode (ISE)
Reported:
4-18 hours
Additional Information:
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Synonyms:
• K
• K+
• Urine electrolytes

COLLECTION

Sample Type:
Timed urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire urine output for collection period
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Remarks:
Refrigerate the container during the period of the collection.
Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Stability (from collection to initiation):
Refrigerated 2 days
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
KUR
Test Group:
Potassium
Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL urine

Minimum Volume:
0.2 mL urine

Unacceptable Conditions:
- Container not refrigerated during collection.

Stability (from collection to initiation):
- Refrigerated 2 days

RESULT INTERPRETATION

Units:
- mmol/D

Reference Interval:
- 25-125 mmol/D

Additional Information:
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
- 84133

COMPLETE VIEW

Available Stat:
- No

Test Code:
- KUR

Test Group:
- Potassium

Performing Lab:
- Parnassus & Mission Bay Chemistry

Performed:
- Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
- Ion selective electrode (ISE)

Remarks:
- Refrigerate the container during the period of the collection.

- Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
- 24 hour urine collection container

Amount to Collect:
- Entire urine output for collection period

Sample Type:
- Timed urine collection

Preferred Volume:
- 1 mL urine

Minimum Volume:
0.2 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection.

**Units:**
- mmol/D

**Reference Interval:**
- 25-125 mmol/D

**Synonyms:**
- K
- K+
- Urine electrolytes

**Stability (from collection to initiation):**
- Refrigerated 2 days

**Reported:**
- 4-18 hours

**Additional Information:**
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

**CPT Codes:**
- 84133
Potassium, Body Fluid
KBF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant

Synonyms:
- K
- K+
- Body fluid electrolytes

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
KBF

Test Group:
Potassium
Performing Lab:
   Parnassus & Mission Bay Chemistry

Preferred Volume:
   1 mL fluid

Minimum Volume:
   0.2 mL fluid

Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
   mmol/L

Additional Information:
   As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

   All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

   Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant

ADMINISTRATIVE

CPT Codes:
   84132

LOINC Codes:
   2821-7

COMPLETE VIEW

Available Stat:
   Yes

Ordering Recommendations:
   Not a routinely available test. See 'Additional information'

Test Code:
   KBF

Test Group:
   Potassium

Performing Lab:
   Parnassus & Mission Bay Chemistry

Performed:
   Test available 24 hours per day 7 days per week

Methodology:
   Ion selective electrode (ISE)

Remarks:
   Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
   Red top or clean container

Amount to Collect:
   5 mL fluid

Sample Type:
   Body Fluid

Preferred Volume:
   1 mL fluid
Minimum Volume:
0.2 mL fluid

Units:
mmol/L

Synonyms:
- K
- K+
- Body fluid electrolytes

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant

CPT Codes:
84132

LOINC Codes:
2821-7
Potassium, Plasma / Serum

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Ion selective electrode (ISE)
Reported: STAT 1 hour, Routine 4 hours
Additional Information: Hemolysis may artifactually increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values < 1.5 or > 12 are automatically reassayed.
Synonyms: K, K+, Electrolytes

COLLECTION

Sample Type: Plasma or serum
Collect: Light green top preferred, Gold top acceptable
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: K
Test Group: Potassium
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
<1 year 3.2-6.0 mmol/L
>1 year 3.5-5.1 mmol/L

2. Adult range used for children >1 year old.
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF with the lower limits of normal adjusted to encompass results from plasma specimens.

Critical Values:
<3.0 mmol/L or > 6.0 mmol/L

Additional Information:
Hemolysis may artifactually increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values < 1.5 or > 12 are automatically reassayed.

ADMINISTRATIVE

CPT Codes:
84132

LOINC Codes:
2823-3

COMPLETE VIEW

Available Stat:
Yes

Test Code:
K

Test Group:
Potassium

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mmol/L
Reference Interval:

<1 year 3.2-6.0 mmol/L
>1 year 3.5-5.1 mmol/L

2. Adult range used for children >1 year old.
3. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF with the lower limits of normal adjusted to encompass results from plasma specimens.

Critical Values:

<3.0 mmol/L or > 6.0 mmol/L

Synonyms:

• K
• K+
• Electrolytes

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:

STAT 1 hour, Routine 4 hours

Additional Information:

Hemolysis may artifactually increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values < 1.5 or > 12 are automatically reassayed.

CPT Codes:

84132

LOINC Codes:

2823-3
Potassium, random urine
KU

ORDERING

Available Stat:  
Yes
Performing Lab:  
Parnassus & Mission Bay Chemistry
Performed:  
Test available 24 hours per day 7 days per week
Methodology:  
Ion selective electrode (ISE)
Reported:  
4-18 hours
Synonyms:  
• K
• K+
• Urine electrolytes

COLLECTION

Sample Type:  
Random urine
Collect:  
Urine cup
Amount to Collect:  
20 mL urine
Preferred Volume:  
1 mL urine
Minimum Volume:  
0.2 mL urine
Stability (from collection to initiation):  
Refrigerated 2 days

PROCESSING

Test Code:  
KU
Test Group:  
Potassium
Performing Lab:  
Parnassus & Mission Bay Chemistry
Preferred Volume:  
1 mL urine
Minimum Volume:  
0.2 mL urine
Stability (from collection to initiation):  
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mmol/L

**Reference Interval:**
Varies with diet, typically > 20 mmol/d

---

**ADMINISTRATIVE**

**CPT Codes:**
- 84133

**LOINC Codes:**
- 2828-2

---

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
KU

**Test Group:**
Potassium

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Ion selective electrode (ISE)

**Collect:**
Urine cup

**Amount to Collect:**
20 mL urine

**Sample Type:**
Random urine

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.2 mL urine

**Units:**
mmol/L

**Reference Interval:**
Varies with diet, typically > 20 mmol/d

**Synonyms:**
- K
- K+
- Urine electrolytes

**Stability (from collection to initiation):**
Refrigerated 2 days

**Reported:**
4-18 hours

**CPT Codes:**
- 84133

**LOINC Codes:**
- 2828-2

---

Printed 06/07/19
Test information subject to change
Potassium, Stool
KST

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
4 hours

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Synonyms:
- K
- K+
- Stool electrolytes

COLLECTION

Sample Type:
Watery Stool

Collect:
Clean container or urine cup

Unacceptable Conditions:
Non-watery stool received

PROCESSING

Test Code:
KST

Test Group:
Potassium

Performing Lab:
Parnassus Chemistry

Unacceptable Conditions:
Non-watery stool received

RESULT INTERPRETATION

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**
- 84132

---

**Complete View**

**Available Stat:**
- No

**Ordering Recommendations:**
- Not a routinely available test. See 'Additional information'

**Test Code:**
- KST

**Test Group:**
- Potassium

**Performing Lab:**
- Parnassus Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Ion selective electrode (ISE)

**Collect:**
- Clean container or urine cup

**Sample Type:**
- Watery Stool

**Unacceptable Conditions:**
- Non-watery stool received

**Synonyms:**
- K
- K+
- Stool electrolytes

**Reported:**
- 4 hours

**Additional Information:**
- Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

- As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

- All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**
- 84132
Potassium, whole blood (MtZ Only)
KSB

ORDERING

Approval Required:
Yes, contact Blood Bank at x3-1313. Requires Blood Bank lab medicine resident's approval when test is ordered on transfused blood unit.

Available Stat:
Yes

Performing Lab:
Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)
NCPL: Radiometer ABL 800
MtZ: Gem Premier 3500

Reported:
Stat 15 min, Routine 30 min

Additional Information:
Hemolysis may artifactually increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values < 1.5 or > 12 are automatically reassayed.

Synonyms:
- K
- K+
- Electrolytes

COLLECTION

Sample Type:
Heparinized whole blood (Blood gas syringe only)

Collect:
Plastic syringe containing 100U of dry heparin

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Remarks:
Fill syringe completely, remove needle, expel all bubbles and cap sample. Deliver immediately to lab for testing.

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

PROCESSING

Test Code:
KSB

Test Group:
Potassium
Performing Lab:
Mt. Zion Chemistry

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

RESULT INTERPRETATION

Units:
mmol/L

Reference Interval:
<= 1 year: 3.0-5.4 mmol/L
> 1 year: 3.4-4.5 mmol/L

Critical Values:
<3.0 mmol/L or > 6.0 mmol/L

Additional Information:
Hemolysis may artifactualy increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values < 1.5 or > 12 are automatically reassayed.

ADMINISTRATIVE

CPT Codes:
84132

LOINC Codes:
6298-4

COMPLETE VIEW

Approval Required:
Yes, contact Blood Bank at x3-1313. Requires Blood Bank lab medicine resident's approval when test is ordered on transfused blood unit.

Available Stat:
Yes

Test Code:
KSB

Test Group:
Potassium

Performing Lab:
Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)
NCPL: Radiometer ABL 800
MtZ: Gem Premier 3500

Remarks:
Fill syringe completely, remove needle, expel all bubbles and cap sample. Deliver immediately to lab for testing.

Collect:
Plastic syringe containing 100U of dry heparin

Amount to Collect:
3 mL blood

**Sample Type:**
- Heparinized whole blood (Blood gas syringe only)

**Preferred Volume:**
- 3 mL blood

**Minimum Volume:**
- 1 mL blood

**Unacceptable Conditions:**
- Samples submitted > 30 min. after collection. Samples with needle attached, containing large bubbles, unlabeled, mislabeled, clotted or of insufficient volume for testing.

**Units:**
- mmol/L

**Reference Interval:**
- &le; 1 year: 3.0-5.4 mmol/L
- > 1 year: 3.4-4.5 mmol/L

**Critical Values:**
- <3.0 mmol/L or > 6.0 mmol/L

**Synonyms:**
- K
- K+
- Electrolytes

**Reported:**
- Stat 15 min, Routine 30 min

**Additional Information:**
- Hemolysis may artifactually increase the result. Levels in serum are normally 0.3 mmol/L higher than plasma levels due to liberation of potassium by platelets during clotting (c. 0.07 mmol/L per 100K platelets). Thus not only hemolysis but thrombocytosis can falsely elevate potassium levels, which can be circumvented by measuring plasma rather than serum potassium. Values &lt; 1.5 or &gt; 12 are automatically reassayed.

**CPT Codes:**
- 84132

**LOINC Codes:**
- 6298-4
Prader-Willi/Angelman Syndromes  

PWA

ORDERING

Available Stat:  
No

Performing Lab:  
Medical Genomics - Molecular Diagnostics

Performed:  
Run 1x per week as needed, Wednesday or Friday, day shift only

Methodology:  
Methylation sensitive Southern blot

Reported:  
10-14 days

Additional Information:  
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A normal fetus inherits one copy of chromosome 15 from each parent. If the fetus inherits two paternal chromosome 15’s because of uniparental disomy or carries a maternal chromosomal 15 deletion then the Angelman (Happy Puppet) Syndrome results.

If the fetus inherits only the maternal chromosome as a result of paternal chromosome deletion, then the Prader-Willi Syndrome results.

This assay identifies approximately 95-99% of Prader-Willi patients and 80-78% of Angelman patients; in the remaining cases of Angelman syndrome DNA sequencing of the UBE3A gene may uncover point mutations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

Synonyms:  
- Happy puppet syndrome

COLLECTION

Sample Type:  
EDTA Whole blood, Cultured amniocytes, Cultured chorionic villi

Collect:  
Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable

Amount to Collect:  
3 mL blood

Preferred Volume:  
3 mL blood

Minimum Volume:  
2 mL blood

Remarks:  
If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):  
Blood samples are stable for up to one week.

Unacceptable Conditions:  
Samples collected in outdated blue top vacutainer.

PROCESSING

Test Code:  
PWA
Performing Lab:
   Medical Genomics - Molecular Diagnostics

Specimen Preparation:
   Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Preferred Volume:
   3 mL blood

Minimum Volume:
   2 mL blood

Unacceptable Conditions:
   Samples collected in outdated blue top vacutainer.

Stability (from collection to initiation):
   Blood samples are stable for up to one week.

RESULT INTERPRETATION

Reference Interval:
   Negative

Additional Information:
   An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

   A normal fetus inherits one copy of chromosome 15 from each parent. If the fetus inherits two paternal chromosome 15's because of uniparental disomy or carries a maternal chromosomal 15 deletion then the Angelman (Happy Puppet) Syndrome results.

   If the fetus inherits only the maternal chromosome as a result of paternal chromosome deletion, then the Prader-Willi Syndrome results.

   This assay identifies approximately 95 99% of Prader-Willi patients and 80 78% of Angelman patients; in the remaining cases of Angelman syndrome DNA sequencing of the UBE3A gene may uncover point mutations.

   If a mutation is detected it is recommended that the patient seek genetic counseling.

ADMINISTRATIVE

CPT Codes:
   81331

LDT or Modified FDA:
   Yes

LOINC Codes:
   36915-7

COMPLETE VIEW

Available Stat:
   No

Test Code:
   PWA

Performing Lab:
   Medical Genomics - Molecular Diagnostics

Performed:
   Run 1x per week as needed, Wednesday or Friday, day shift only

Methodology:
   Methylation sensitive Southern blot

Remarks:
   If collecting in citrate, check the expiration date on the label of the blue top vacutainer before drawing the patient.

   Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top, Blue (citrate) and Yellow (ACD) tops acceptable

**Amount to Collect:**
3 mL blood

**Sample Type:**
- EDTA Whole blood, Cultured amniocytes, Cultured chorionic villi

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
2 mL blood

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer.

**Specimen Preparation:**
Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Reference Interval:**
Negative

**Synonyms:**
- Happy puppet syndrome

**Stability (from collection to initiation):**
Blood samples are stable for up to one week.

**Reported:**
10-14 days

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A normal fetus inherits one copy of chromosome 15 from each parent. If the fetus inherits two paternal chromosome 15's because of uniparental disomy or carries a maternal chromosomal 15 deletion then the Angelman (Happy Puppet) Syndrome results.

If the fetus inherits only the maternal chromosome as a result of paternal chromosome deletion, then the Prader-Willi Syndrome results.

This assay identifies approximately 95-99% of Prader-Willi patients and 80-78% of Angelman patients; in the remaining cases of Angelman syndrome DNA sequencing of the UBE3A gene may uncover point mutations.

If a mutation is detected it is recommended that the patient seek genetic counseling.

**CPT Codes:**
81331

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
36915-7
Prealbumin, Serum / Plasma
PAB

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Rate nephelometry
Reported:
1-3 days
Additional Information:
Lipemia interferes with the assay. Newborn infants may have levels as low as 2 mg/dL.

COLLECTION

Sample Type:
Serum or plasma
Collect:
Gold top preferred, Light green top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Unacceptable Conditions:
Lipemic samples

PROCESSING

Test Code:
PAB
Performing Lab:
Immunology
Specimen Preparation:
Refrigerate
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Unacceptable Conditions:
Lipemic samples

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
Additional Information:
Lipemia interferes with the assay. Newborn infants may have levels as low as 2 mg/dL.

CPT Codes:
- 84134

LOINC Codes:
- 46130-1

Available Stat:
- No

Test Code:
- PAB

Performing Lab:
- Immunology

Performed:
- Monday-Friday (day shift)

Methodology:
- Rate nephelometry

Collect:
- Gold top preferred, Light green top acceptable

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 0.5 mL serum or plasma

Minimum Volume:
- 0.3 mL serum or plasma

Unacceptable Conditions:
- Lipemic samples

Specimen Preparation:
- Refrigerate

Units:
- mg/dL

Reference Interval:
- 20-37 mg/dL

Reported:
- 1-3 days

Additional Information:
Lipemia interferes with the assay. Newborn infants may have levels as low as 2 mg/dL.

CPT Codes:
- 84134

LOINC Codes:
- 46130-1
Pregnanetriol
PRTL

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
GCMS
Reported:
Test run Tuesday. Turnaround time: 4-9 days
Additional Information:
Pregnanetriol concentrations are elevated in 21-hydroxylase deficiency, the most common cause of congenital adrenal hyperplasia (CAH). Pregnanetriol concentrations may be useful in monitoring treatment of patients with 21-hydroxylase deficiency.

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
5 mL urine
Minimum Volume:
3 ml urine
Remarks:
Refrigerate collection container during collection.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 48 hours, frozen at -20C 1 month.
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
PRTL
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze aliquot at -20C and transport frozen. Order Quest #7625N
Preferred Volume:
5 mL urine
Minimum Volume:
3 ml urine
Unacceptable Conditions:
Container not refrigerated during collection.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 48 hours, frozen at -20C 1 month.
RESULT INTERPRETATION

Units:
   µg/24 hours (mcg/24 hours)

Reference Interval:
   Males: 71-1000 µg/24 hours
   Females: 47-790 µg/24 hours

Additional Information:
   Pregnanetriol concentrations are elevated in 21-hydroxylase deficiency, the most common cause of congenital adrenal hyperplasia (CAH). Pregnanetriol concentrations may be useful in monitoring treatment of patients with 21-hydroxylase deficiency.

ADMINISTRATIVE

CPT Codes:
   84138-90

LOINC Codes:
   2836-5

COMPLETE VIEW

Available Stat:
   No

Test Code:
   PRTL

Performing Lab:
   Quest

Sendout:
   Yes

Methodology:
   GCMS

Remarks:
   Refrigerate collection container during collection.

Collect:
   24 hour urine collection container

Amount to Collect:
   Entire 24 hour urine output

Sample Type:
   24 hour urine collection

Preferred Volume:
   5 mL urine

Minimum Volume:
   3 mL urine

Unacceptable Conditions:
   Container not refrigerated during collection.

Specimen Preparation:
   Freeze aliquot at -20C and transport frozen. Order Quest #7625N

Units:
   µg/24 hours (mcg/24 hours)

Reference Interval:
   Males: 71-1000 µg/24 hours
   Females: 47-790 µg/24 hours

Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 48 hours, frozen at -20C 1 month.

Reported:
Test run Tuesday. Turnaround time: 4-9 days

**Additional Information:**

Pregnanetriol concentrations are elevated in 21-hydroxylase deficiency, the most common cause of congenital adrenal hyperplasia (CAH). Pregnanetriol concentrations may be useful in monitoring treatment of patients with 21-hydroxylase deficiency.

**CPT Codes:**

84138-90

**LOINC Codes:**

2836-5
Pregnenolone
PREGN

ORDERING
Performing Lab: Quest
Performed: Sun-Fri
Methodology: LC/MS/MS
Reported: 1-4 days

COLLECTION
Sample Type: Serum
Collect: Red top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: 72 hours
Frozen -20° C: 14 days
Frozen -70° C: 30 days
Storage/Transport Temperature: Frozen
Unacceptable Conditions:
Moderate to gross hemolysis • Received room temperature • Serum separator tube (SST®)

PROCESSING
Test Code: PREGN
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Aliquot and freeze serum. Transport to CB frozen. Order Quest test code 28373P.
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Unacceptable Conditions:
Moderate to gross hemolysis • Received room temperature • Serum separator tube (SST®)
Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: 72 hours
Frozen -20° C: 14 days
Frozen -70° C: 30 days

Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION

Units:
ng/dL
Reference Interval:
Adult: 22-237 ng/dL

<table>
<thead>
<tr>
<th>Age</th>
<th>ng/dL</th>
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<tbody>
<tr>
<td>1 - 59 Days</td>
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<td>15 - 220</td>
</tr>
<tr>
<td>13 - 17 Years</td>
<td>12 - 196</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
84140

LOINC Codes:
2837-3

COMPLETE VIEW

Test Code:
PREGN
Performing Lab:
Quest
Sendout:
Yes
Performed:
Sun-Fri
Methodology:
LC/MS/MS
Collect:
Red top
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Unacceptable Conditions:
Moderate to gross hemolysis • Received room temperature • Serum separator tube (SST®)
Specimen Preparation:
Aliquot and freeze serum. Transport to CB frozen. Order Quest test code 28373P.

**Units:**
ng/dL

**Reference Interval:**
Adult: 22-237 ng/dL

<table>
<thead>
<tr>
<th>Age</th>
<th>ng/dL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 59 Days</td>
<td>68 - 1303</td>
</tr>
<tr>
<td>60 Days - 1 Year</td>
<td>&lt;= 219</td>
</tr>
<tr>
<td>2 - 6 Years</td>
<td>&lt;= 140</td>
</tr>
<tr>
<td>7 - 9 Years</td>
<td>156</td>
</tr>
<tr>
<td>10 - 12 Years</td>
<td>15 - 220</td>
</tr>
<tr>
<td>13 - 17 Years</td>
<td>12 - 196</td>
</tr>
</tbody>
</table>

**Storage/Transport Temperature:**
Frozen

**Stability (from collection to initiation):**
- Room temperature: Unacceptable
- Refrigerated: 72 hours
- Frozen -20° C: 14 days
- Frozen -70° C: 30 days

**Reported:**
1-4 days

**CPT Codes:**
84140

**LOINC Codes:**
2837-3
Prenatal Screen, Cell-free DNA
CFFD

ORDERING

Performing Lab:
   Counsyl
Methodology:
   Massively parallel sequencing
Reported:
   7 days
Additional Information:
   Determination in women at high risk for fetal trisomies 13, 18, and 21 who are pregnant with twins or a single fetus of at least 10 weeks' gestation. Test results that suggest high risk for fetal trisomy should prompt consideration for genetic counseling and/or additional genetic testing. Test results that suggest low risk for fetal trisomy should be reviewed with the patient by the health care provider. Results should be considered in the context of other clinical criteria.

Synonyms:
   - Counsyl Prelude Prenatal Screen
   - NIPT
   - Non-invasive prenatal test

COLLECTION

Sample Type:
   Whole blood
Collect:
   Cell-Free DNA (cfDNA) BCT Tube
Amount to Collect:
   10 mL blood
Preferred Volume:
   10 mL blood
Minimum Volume:
   10 mL blood
Remarks:
   Draw two BCT black/tan tubes per patient. Fully completed Counsyl requisition/kit required before draw.
Stability (from collection to initiation):
   5 days
Rejection Criteria:
   Gestational age <10 weeks; incorrect or expired blood tube; quantity not sufficient for analysis; specimen received more than five days from collection; excessive hemolysis; frozen specimens

PROCESSING

Test Code:
   CFFD
Sendout:
   Yes
Performing Lab:
   Counsyl
Specimen Preparation:
   Do not aliquot. Maintain at ambient temperature.
Preferred Volume:
   10 mL blood
Minimum Volume:
10 mL blood

**Rejection Criteria:**
- Gestational age <10 weeks; incorrect or expired blood tube; quantity not sufficient for analysis; specimen received more than five days from collection; excessive hemolysis; frozen specimens

**Stability (from collection to initiation):**
- 5 days

---

**RESULT INTERPRETATION**

**Additional Information:**
Determination in women at high risk for fetal trisomies 13, 18, and 21 who are pregnant with twins or a single fetus of at least 10 weeks' gestation. Test results that suggest high risk for fetal trisomy should prompt consideration for genetic counseling and/or additional genetic testing. Test results that suggest low risk for fetal trisomy should be reviewed with the patient by the health care provider. Results should be considered in the context of other clinical criteria.

---

**ADMINISTRATIVE**

**CPT Codes:**
- 81599-90

---

**COMPLETE VIEW**

**Test Code:**
- CFFD

**Performing Lab:**
- Counsyl

**Sendout:**
- Yes

**Methodology:**
- Massively parallel sequencing

**Remarks:**
- Draw two BCT black/tan tubes per patient. Fully completed Counsyl requisition/kit required before draw.

**Collect:**
- Cell-Free DNA (cfDNA) BCT Tube

**Amount to Collect:**
- 10 mL blood

**Sample Type:**
- Whole blood

**Preferred Volume:**
- 10 mL blood

**Minimum Volume:**
- 10 mL blood

**Rejection Criteria:**
- Gestational age <10 weeks; incorrect or expired blood tube; quantity not sufficient for analysis; specimen received more than five days from collection; excessive hemolysis; frozen specimens

**Specimen Preparation:**
- Do not aliquot. Maintain at ambient temperature.

**Synonyms:**
- Counsyl Prelude Prenatal Screen
- NIPT
- Non-invasive prenatal test

**Stability (from collection to initiation):**
- 5 days

**Reported:**
- 7 days
Additional Information:

Determination in women at high risk for fetal trisomies 13, 18, and 21 who are pregnant with twins or a single fetus of at least 10 weeks’ gestation. Test results that suggest high risk for fetal trisomy should prompt consideration for genetic counseling and/or additional genetic testing. Test results that suggest low risk for fetal trisomy should be reviewed with the patient by the health care provider. Results should be considered in the context of other clinical criteria.

CPT Codes:
81599-90
Pre-Surgical Type & Screen  
BB28

ORDERING

Available Stat: 
No

Performing Lab: 
Parnassus Mt. Zion & Mission Bay Blood Banks

Performed: 
Test available 24-hours a day 7-days a week at Parnassus and Mission Bay Blood Banks only. 
Testing available at Mt. Zion 0700 Monday to 2300 Friday.

Reported: 
Routine 4 hours

Additional Information: 
Samples for this test should NOT be collected > 28 days prior to the patient's planned procedure.

If the patient has been transfused or pregnant in the preceding 3 months sample should NOT be collected > 3 days prior to procedure. The concern is that such patients could be developing red cell allo-antibodies that could be missed if the samples are collected too far in advance.

Synonyms:
• Specimen In BB-28 Days

COLLECTION

Sample Type: 
EDTA whole blood

Collect: 
Lavender top (6 mL)

Amount to Collect: 
See preferred volume.

Preferred Volume:

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Amount to Collect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
<td>2x Full Microtainer (1.6 mL)</td>
</tr>
<tr>
<td>4 mo - 1 year</td>
<td>3 mL</td>
</tr>
<tr>
<td>1 -18 years</td>
<td>3 - 6 mL (3 mL OK for small children)</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>6 mL x 2</td>
</tr>
</tbody>
</table>

Minimum Volume:

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Amount to Collect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
<td>Full Microtainer (0.8 mL)</td>
</tr>
<tr>
<td>4 mo - 1 year</td>
<td>1 mL</td>
</tr>
<tr>
<td>1 -18 years</td>
<td>3 mL (3 mL OK for small children)</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>5 mL</td>
</tr>
</tbody>
</table>

Remarks: 
Specimen label must contain the date the sample was collected and the legible name or ID of the person who collected the sample

Unacceptable Conditions: 
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code: 
BB28

Performing Lab: 
Parnassus Mt. Zion & Mission Bay Blood Banks
**Preferred Volume:**

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Amount to Collect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
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<td>3 mL (3 mL OK for small children)</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>5 mL</td>
</tr>
</tbody>
</table>

**Unacceptable Conditions:**

Unsigned, mislabeled, unlabeled or hemolyzed sample.

---

**RESULT INTERPRETATION**

**Additional Information:**

Samples for this test should **NOT** be collected > 28 days prior to the patient's planned procedure.

If the patient has been transfused or pregnant in the preceding 3 months sample should **NOT be collected > 3 days prior to procedure.** The concern is that such patients could be developing red cell allo-antibodies that could be missed if the samples are collected too far in advance.

---

**ADMINISTRATIVE**

**LOINC Codes:**

34532-2

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

BB28

**Performing Lab:**

Parnassus Mt. Zion & Mission Bay Blood Banks

**Performed:**

Test available 24-hours a day 7-days a week at Parnassus and Mission Bay Blood Banks only.

Testing available at Mt. Zion 0700 Monday to 2300 Friday.

**Remarks:**

Specimen label must contain the date the sample was collected and the legible name or ID of the person who collected the sample

**Collect:**

Lavender top (6 mL)

**Amount to Collect:**

See preferred volume.

**Sample Type:**

EDTA whole blood

**Preferred Volume:**

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Amount to Collect</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;4 mo</td>
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<td>3 mL (3 mL OK for small children)</td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>6 mL x 2</td>
</tr>
</tbody>
</table>

**Minimum Volume:**
Patient Age  Amount to Collect
<4 mo       Full Microtainer (0.8 mL)
4 mo - 1 year 1 mL
1 -18 years 3 mL (3 mL OK for small children)
> 18 years 5 mL

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

Synonyms:
• Specimen In BB-28 Days

Reported:
Routine 4 hours

Additional Information:
Samples for this test should NOT be collected > 28 days prior to the patient's planned procedure.

If the patient has been transfused or pregnant in the preceding 3 months sample should NOT be collected > 3 days prior to procedure. The concern is that such patients could be developing red cell allo-antibodies that could be missed if the samples are collected too far in advance.

LOINC Codes:
34532-2
Primidone
PRIM

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Test performed Monday-Saturday. Turnaround time: 1-4 days.
Additional Information:
Assay of Primidone levels is accompanied by the measurement of Primidone's major metabolite Phenobarbital, for which Quest considers the adult therapeutic level to be 10-40 mg/L, the pediatric therapeutic level to be 10-30, and the potentially toxic level to be > 40. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
Synonyms:
- Mysoline

COLLECTION

Sample Type:
Serum (EDTA plasma acceptable)
Collect:
Red top (Gold top NOT acceptable), Lavender OK
Amount to Collect:
4 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Remarks:
Time to steady state: 2-3 days.
A trough levels is ideally drawn < 1 hour before the next dose.
Indicate the time of draw on the requisition.
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 1 month
Unacceptable Conditions:
Collected in Gold top (SST). Severely icteric, lipemic or hemolyzed samples
Rejection Criteria:
Severely icteric, lipemic or hemolyzed samples

PROCESSING

Test Code:
PRIM
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge and immediately separate serum or plasma specimens from the cells into clean, plastic screw-capped vials. Refrigerate.
Order Quest test # 751X. If B/T, order LabCorp #007856

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Unacceptable Conditions:
Collected in Gold top (SST). Severely icteric, lipemic or hemolyzed samples

Rejection Criteria:
Severely icteric, lipemic or hemolyzed samples

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 2 weeks, frozen at -20°C 1 month

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Primidone:
Therapeutic: 5-15 mg/L
Potentially toxic: > 15 mg/L

Phenobarbital: 15.0-40.0 mg/L

Critical Values:
Quest Priority-1: > 15 mg/L

Additional Information:
Assay of Primidone levels is accompanied by the measurement of Primidone's major metabolite Phenobarbital, for which Quest considers the adult therapeutic level to be 10-40 mg/L, the pediatric therapeutic level to be 10-30, and the potentially toxic level to be > 40. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80188-90, 80184-90

LOINC Codes:
3978-4

COMPLETE VIEW

Available Stat:
No

Test Code:
PRIM

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Imunoassay

Remarks:
Time to steady state: 2-3 days.

A trough levels is ideally drawn < 1 hour before the next dose.

Indicate the time of draw on the requisition.

Collect:
Red top (Gold top NOT acceptable), Lavender OK
Amount to Collect:
  4 mL blood
Sample Type:
  Serum (EDTA plasma acceptable)
Preferred Volume:
  1 mL serum or plasma
Minimum Volume:
  0.5 mL serum or plasma
Rejection Criteria:
  Severely icteric, lipemic or hemolyzed samples
Unacceptable Conditions:
  Collected in Gold top (SST). Severely icteric, lipemic or hemolyzed samples
Specimen Preparation:
  Centrifuge and immediately separate serum or plasma specimens from the cells into clean, plastic screw-capped vials. Refrigerate.
  Order Quest test # 751X . If B/T, order LabCorp #007856
Units:
  mg/L
Reference Interval:
  Primidone:
    Therapeutic: 5-15 mg/L
    Potentially toxic: > 15 mg/L
  Phenobarbital: 15.0-40.0 mg/L
Critical Values:
  Quest Priority-1: > 15 mg/L
Synonyms:
  • Mysoline
Stability (from collection to initiation):
  Room temperature 3 days, refrigerated 2 weeks, frozen at -20C 1 month
Reported:
  Test performed Monday-Saturday. Turnaround time: 1-4 days.
Additional Information:
  Assay of Primidone levels is accompanied by the measurement of Primidone’s major metabolite Phenobarbital, for which Quest considers the adult therapeutic level to be 10-40 mg/L, the pediatric therapeutic level to be 10-30, and the potentially toxic level to be > 40. See the lab manual’s "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
CPT Codes:
  80188-90, 80184-90
LOINC Codes:
  3978-4
Pro-B-Type Natriuretic Peptide, N-terminal
PBNP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
ECLIA
Reported:
3-6 days

Additional Information:
BNP, is the active form of this protein hormone, has a short biological half-life of 20 minutes. NT-ProBNP, inactive fragment, has a half-life of 1-2 hours. Both are increased in CHF and both levels correlate to the severity of condition. In the future these two hormones may be used as prognostic indicators in ACS also; studies have shown that levels predict cardiac mortality and adverse cardiac events in patients with ACS.

Because of its longer half-life, there are advantages to measuring NT-ProBNP over BNP. In CHF patients receiving exogenous and synthetic BNP for treatment, BNP levels may be affected while NT-ProBNP will not be affected. NT-ProBNP is thought to be primarily cleared by kidneys and therefore falsely elevated in severe renal disease.

Note that BNP is available stat while NT-Pro BNP is not

Synonyms:
- BNP
- brain type
- ANF
- ANH
- Atrial Natriuretic factor
- Atrial Natriuretic Hormone
- Pro-BNP
- NT-Pro BNP

COLLECTION

Sample Type:
Serum or EDTA Plasma
Collect:
Gold top, Red top or Lavender Top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL Serum or EDTA plasma
Minimum Volume:
0.3 mL Serum or EDTA plasma
Stability (from collection to initiation):
Room temperature or refrigerated 3 days, frozen 1 year.
Unacceptable Conditions:
Gross hemolysis
Rejection Criteria:
Gross hemolysis
PROCESSING

Test Code: PBNP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Centrifuge and aliquot serum/plasma. Freeze aliquot. Transport to CB frozen. Order Quest test code 11188.
Preferred Volume: 1 mL Serum or EDTA plasma
Minimum Volume: 0.3 mL Serum or EDTA plasma
Unacceptable Conditions: Gross hemolysis
Rejection Criteria: Gross hemolysis
Stability (from collection to initiation): Room temperature or refrigerated 3 days, frozen 1 year.

RESULT INTERPRETATION

Units: pg/mL
Reference Interval: 18-49 years <=300 pg/mL Normal, heart failure unlikely
>=450 pg/mL High probability of heart failure
>= 50 Years <=300 pg/mL Normal, heart failure unlikely
>=900 pg/mL High probability of heart failure

Additional Information: BNP, is the active form of this protein hormone, has a short biological half-life of 20 minutes. NT-ProBNP, inactive fragment, has a half-life of 1-2 hours. Both are increased in CHF and both levels correlate to the severity of condition. In the future these two hormones may be used as prognostic indicators in ACS also; studies have shown that levels predict cardiac mortality and adverse cardiac events in patients with ACS.

Because of its longer half-life, there are advantages to measuring NT-ProBNP over BNP. In CHF patients receiving exogenous and synthetic BNP for treatment, BNP levels may be affected while NT-ProBNP will not be affected. NT-ProBNP is thought to be primarily cleared by kidneys and therefore falsely elevated in severe renal disease.

Note that BNP is available stat while NT-Pro BNP is not

ADMINISTRATIVE

CPT Codes: 83880-90
LOINC Codes: 33762-6

COMPLETE VIEW

Available Stat: No
Test Code: PBNP
Performing Lab: Quest
Sendout: Yes
Methodology: ECLIA
Collect: Gold top, Red top or Lavender Top
Amount to Collect: 2 mL blood
Sample Type: Serum or EDTA Plasma
Preferred Volume: 1 mL Serum or EDTA plasma
Minimum Volume: 0.3 mL Serum or EDTA plasma
Rejection Criteria: Gross hemolysis
Unacceptable Conditions: Gross hemolysis
Specimen Preparation: Centrifuge and aliquot serum/plasma. Freeze aliquot. Transport to CB frozen. Order Quest test code 11188.
Units: pg/mL
Reference Interval:
18-49 years <=300 pg/mL Normal, heart failure unlikely
>=450 pg/mL High probability of heart failure
>= 50 Years <=300 pg/mL Normal, heart failure unlikely
>=900 pg/mL High probability of heart failure
Synonyms:
- BNP
- brain type
- ANF
- ANH
- Atrial Natriuretic factor
- Atrial Natriuretic Hormone
- Pro-BNP
- NT-Pro BNP
Stability (from collection to initiation):
Room temperature or refrigerated 3 days, frozen 1 year.
Reported: 3-6 days
Additional Information:
BNP, is the active form of this protein hormone, has a short biological half-life of 20 minutes. NT-ProBNP, inactive fragment, has a half-life of 1-2 hours. Both are increased in CHF and both levels correlate to the severity of condition. In the future these two hormones may be used as prognostic indicators in ACS also; studies have shown that levels predict cardiac mortality and adverse cardiac events in patients with ACS.

Because of its longer half-life, there are advantages to measuring NT-ProBNP over BNP. In CHF patients receiving exogenous and synthetic BNP for treatment, BNP levels may be affected while NT-ProBNP will not be affected. NT-ProBNP is thought to be primarily cleared by kidneys and therefore falsely elevated in severe renal disease.

Note that BNP is available stat while NT-Pro BNP is not
CPT Codes:
83880-90
LOINC Codes:
33762-6
Procainamide  
PNAPA

**ORDERING**

- **Available Stat:** No
- **Performing Lab:** Quest
- **Methodology:** Immunoassay
- **Reported:** 3-5 days
- **Additional Information:** Includes measurement of the metabolite NAPA. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
- **Synonyms:**
  - Pronestyl
  - Procan
  - N-Acetylprocainamide
  - NAPA

**COLLECTION**

- **Sample Type:** Serum or plasma
- **Collect:** Red top preferred (Gold top **NOT** acceptable) Lavender top, Light green top or Gray top acceptable
- **Amount to Collect:** 2 mL blood
- **Preferred Volume:** 1 mL serum or plasma
- **Minimum Volume:** 0.2 mL serum or plasma
- **Remarks:**
  - Time to steady state: 12-24 hours.
  - Collect samples 6-12 hours after start of infusion.
  - Indicate date and time of draw on requisition.
  - **DO NOT** collect in Gold top. Trough should be collected just before next dose.
- **Stability (from collection to initiation):** Room temperature 4 days, refrigerated 1 week.
- **Unacceptable Conditions:** Sample collected in Gold top

**PROCESSING**

- **Test Code:** PNAPA
- **Sendout:** Yes
- **Performing Lab:** Quest
Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 851N.

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Unacceptable Conditions:
Sample collected in Gold top

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week.

RESULT INTERPRETATION

Units:
mg/L

Reference Interval:
Therapeutic: 4.0-8.0 mg/L
Potentially toxic: > 16.0 mg/L
NAPA: < 30.0 mg/L

Critical Values:
>= 14 mg/L (> 30 mg/L for total of Procainamide + NAPA)

Additional Information:
Includes measurement of the metabolite NAPA. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80912-90

LOINC Codes:
3982-6, 3834-9, 3983-4

COMPLETE VIEW

Available Stat:
No

Test Code:
PNAPA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Imunoassay

Remarks:
Time to steady state: 12-24 hours.
Collect samples 6-12 hours after start of infusion.
Indicate date and time of draw on requisition.
DO NOT collect in Gold top. Trough should be collected just before next dose.

Collect:
Red top preferred (Gold top NOT acceptable) Lavender top, Light green top or Gray top acceptable

Amount to Collect:
2 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Unacceptable Conditions:
Sample collected in Gold top

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 851N.

Units:
mg/L

Reference Interval:
Therapeutic: 4.0-8.0 mg/L
Potentially toxic: > 16.0 mg/L
NAPA: < 30.0 mg/L

Critical Values:
>= 14 mg/L (> 30 mg/L for total of Procainamide + NAPA)

Synonyms:
• Pronestyl
• Procan
• N-Acetylprocainamide
• NAPA

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week.

Reported:
3-5 days

Additional Information:
Includes measurement of the metabolite NAPA. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
80912-90

LOINC Codes:
3982-6, 3834-9, 3983-4
Procalcitonin
PCTN

ORDERING

Ordering Recommendations:
Click here for the Procalcitonin (PCT) Clinical Decision Support Tool.

Performing Lab:
Chemistry China Basin

Performed:
Daily (day shift only)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

Synonyms:
- PCT
- Sepsis

COLLECTION

Sample Type:
Plasma or serum

Collect:
Preferred: Lt Green (Li-Heparin) top
Acceptable: Gold top

Amount to Collect:
1 mL blood

Preferred Volume:
0.3 mL plasma/serum

Minimum Volume:
0.15 mL plasma/serum

Remarks:
When monitoring patients, use the same specimen collection tube type throughout the evaluation.

Stability (from collection to initiation):
Room Temperature:
<= 8 hours on the clot, red blood cell, or separator gel
<= 24 hours off the clot, red blood cell, or separator gel

Refrigerated (2-8°C): <= 48 hours
Frozen (-10°C or colder): <= 15 days

Avoid more than 3 freeze-thaw cycles.

Storage/Transport Temperature:
Refrigerated (2-8°C)

PROCESSING

Test Code:
PCTN

Performing Lab:
Chemistry China Basin

Specimen Preparation:
Aliquot and store refrigerated (2-8°C)
Preferred Volume:
0.3 mL plasma/serum

Minimum Volume:
0.15 mL plasma/serum

Stability (from collection to initiation):
Room Temperature:
<= 8 hours on the clot, red blood cell, or separator gel
<= 24 hours off the clot, red blood cell, or separator gel

Refrigerated (2-8°C): <= 48 hours
Frozen (-10°C or colder): <= 15 days

Avoid more than 3 freeze-thaw cycles.

Storage/Transport Temperature:
Refrigerated (2-8°C)

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
<0.26 µg/L

The following cutoffs for guiding interpretation of procalcitonin results were established with the UCSF Infectious Disease service and verified in-house with 30 normal volunteers. These guidelines are also consistent with www.UpToDate.com.

Interpretive Data:
The purpose of procalcitonin (PCT) testing at UCSF is mainly for assisting in decision making about de-escalation of antibiotics in the setting of sepsis and/or lower respiratory tract infection. Importantly, PCT should be used adjunctively with clinical judgment in the de-escalation of antibiotics.

The following cutoffs for guiding interpretation of PCT results were established based on published literature and in consultation with the UCSF Infectious Disease service.

<0.1 microgram/L = very low likelihood of bacterial infection *
0.1-0.25 microgram/L = low likelihood of bacterial infection *
> 0.25 microgram/L = elevated likelihood of bacterial infection *

* Note, these cutoffs for guiding interpretation of PCT results do not apply in all clinical circumstances. Guidelines have not been established for interpretation of procalcitonin results in pediatric patients.

Procalcitonin levels are not elevated in all bacterial infections and may be elevated in other conditions besides bacterial infections.

Examples where false negative results may occur - (low PCT values in presence of bacterial infection):
• Contained infections (mediastinitis, empyema, or abscess)
• Intracellular bacteria (listeria, legionella, mycoplasma)
• Procalcitonin sample drawn in the first 6-12 hours of infection

Examples where false positive results may occur - (elevated PCT values in the absence of bacterial infection):
• Severe trauma
• Surgery
• Cardiac shock
• Burns
• Malaria
• Systemic vasculitis
• Severe pancreatitis
• Receipt of certain immunomodulatory agents: granulocyte transfusions, antilymphocyte globulin, anti-CD3 antibodies
• Systemic fungal and parasitic infections
• Medullary thyroid tumors
• End-stage renal disease (if not yet on hemodialysis)
• Elderly (age >80)

Procalcitonin should not be sent in immunocompromised patients or pregnant patients.

Printed 06/07/19
Test information subject to change
For detailed guidance on interpretation of procalcitonin levels, see www.uptodate.com

**ADMINISTRATIVE**

CPT Codes:
- 84145

LOINC Codes:
- 33959-8

**COMPLETE VIEW**

Ordering Recommendations:
- Click [here](#) for the Procalcitonin (PCT) Clinical Decision Support Tool.

**Test Code:**
- PCTN

**Performing Lab:**
- Chemistry China Basin

**Performed:**
- Daily (day shift only)

**Methodology:**
- Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

**Remarks:**
- When monitoring patients, use the same specimen collection tube type throughout the evaluation.

**Collect:**
- Preferred: Lt Green (Li-Heparin) top
- Acceptable: Gold top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Plasma or serum

**Preferred Volume:**
- 0.3 mL plasma/serum

**Minimum Volume:**
- 0.15 mL plasma/serum

**Specimen Preparation:**
- Aliquot and store refrigerated (2-8°C)

**Units:**
- ng/mL

**Reference Interval:**
- <0.26 µg/L

The following cutoffs for guiding interpretation of procalcitonin results were established with the UCSF Infectious Disease service and verified in-house with 30 normal volunteers. These guidelines are also consistent with www.UpToDate.com.

**Interpretive Data:**

The purpose of procalcitonin (PCT) testing at UCSF is mainly for assisting in decision making about de-escalation of antibiotics in the setting of sepsis and/or lower respiratory tract infection. Importantly, PCT should be used adjunctively with clinical judgment in the de-escalation of antibiotics.

The following cutoffs for guiding interpretation of PCT results were established based on published literature and in consultation with the UCSF Infectious Disease service.

- <0.1 microgram/L = very low likelihood of bacterial infection *
- 0.1-0.25 microgram/L = low likelihood of bacterial infection *
- > 0.25 microgram/L = elevated likelihood of bacterial infection *
* Note, these cutoffs for guiding interpretation of PCT results do not apply in all clinical circumstances. Guidelines have not been established for interpretation of procalcitonin results in pediatric patients. Procalcitonin levels are not elevated in all bacterial infections and may be elevated in other conditions besides bacterial infections.

Examples where false negative results may occur - (low PCT values in presence of bacterial infection):
- Contained infections (mediastinitis, empyema, or abscess)
- Intracellular bacteria (listeria, legionella, mycoplasma)
- Procalcitonin sample drawn in the first 6-12 hours of infection

Examples where false positive results may occur - (elevated PCT values in the absence of bacterial infection):
- Severe trauma
- Surgery
- Cardiac shock
- Burns
- Malaria
- Systemic vasculitis
- Severe pancreatitis
- Receipt of certain immunomodulatory agents: granulocyte transfusions, antilymphocyte globulin, anti-CD3 antibodies
- Systemic fungal and parasitic infections
- Medullary thyroid tumors
- End-stage renal disease (if not yet on hemodialysis)
- Elderly (age >80)

Procalcitonin should not be sent in immunocompromised patients or pregnant patients.

For detailed guidance on interpretation of procalcitonin levels, see www.uptodate.com

**Synonyms:**
- PCT
- Sepsis

**Storage/Transport Temperature:**
Refrigerated (2-8°C)

**Stability (from collection to initiation):**
- Room Temperature:
  - <= 8 hours on the clot, red blood cell, or separator gel
  - <= 24 hours off the clot, red blood cell, or separator gel
- Refrigerated (2-8°C): <= 48 hours
- Frozen (-10°C or colder): <= 15 days

Avoid more than 3 freeze-thaw cycles.

**Reported:**
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

**CPT Codes:**
84145

**LOINC Codes:**
33959-8
Procollagen I Propeptide
P1NP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immonoassay
Reported:
5 - 7 days
Synonyms:
• P1NP

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 27 days, frozen 2 months
Unacceptable Conditions:
Gossly hemolyzed or lipemic samples
Rejection Criteria:
Gossly hemolyzed or lipemic samples

PROCESSING

Test Code:
P1NP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 16609.
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Gossly hemolyzed or lipemic samples
Rejection Criteria:
Gossly hemolyzed or lipemic samples
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 27 days, frozen 2 months

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

ADMINISTRATIVE

CPT Codes:
83519-90

LOINC Codes:
47255-5

COMPLETE VIEW

Available Stat:
No

Test Code:
P1NP

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoassay

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Rejection Criteria:
Gossly hemolyzed or lipemic samples

Unacceptable Conditions:
Gossly hemolyzed or lipemic samples

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 16609.

Units:
µg/L (mcg/L)

Synonyms:
• P1NP

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 27 days, frozen 2 months

Reported:
5 - 7 days

CPT Codes:
83519-90

LOINC Codes:
Progestosterone Quantitative by HPLC-MS/MS, Serum or Plasma
PGSN

ORDERING

Ordering Recommendations:
- Aids in the workup of suspected infertility, detection of ovulation, and assessment of the luteal phase.
Performing Lab:
- ARUP

Performed:
- Sun-Sat

Methodology:
- Quantitative High Performance Liquid Chromatography-Tandem Mass Spectrometry

Reported:
- 1-4 days

Synonyms:
- P4

COLLECTION

Sample Type:
- Serum

Collect:
- Serum Separator Tube (SST). Also acceptable: Plain Red, Pink (K₂EDTA), Plasma Separator Tube (PST), Green (Sodium Heparin), or Green (Lithium Heparin).

Amount to Collect:
- 2 mL blood

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.3 mL serum

Stability (from collection to initiation):
- After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months.

Storage/Transport Temperature:
- Refrigerated. Also acceptable: Frozen.

Unacceptable Conditions:
- Grossly hemolyzed specimens.

PROCESSING

Test Code:
- PGSN

ARUP Test Code:
- 2008509

Sendout:
- Yes

Performing Lab:
- ARUP

Specimen Preparation:
- Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Additional Processing Instructions:
- Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 2008509.

Preferred Volume:
- 1 mL serum
Minimum Volume: 
0.3 mL serum

Unacceptable Conditions: 
Grossly hemolyzed specimens.

Stability (from collection to initiation): 
After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months.

Storage/Transport Temperature: 
Refrigerated. Also acceptable: Frozen.

RESULT INTERPRETATION

Reference Interval: 
Effective May 16, 2016

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>Not Established</td>
</tr>
<tr>
<td>1-16 years</td>
<td>Less than or equal to 0.15 ng/mL</td>
</tr>
<tr>
<td>17 years and older</td>
<td>Less than or equal to 0.11 ng/mL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>Not Established</td>
</tr>
<tr>
<td>1-10 years</td>
<td>Less than or equal to 0.28 ng/mL</td>
</tr>
<tr>
<td>11 years</td>
<td>Less than or equal to 2.55 ng/mL</td>
</tr>
<tr>
<td>12 years</td>
<td>Less than or equal to 8.56 ng/mL</td>
</tr>
<tr>
<td>13 years</td>
<td>Less than or equal to 6.93 ng/mL</td>
</tr>
<tr>
<td>14 years</td>
<td>Less than or equal to 12.04 ng/mL</td>
</tr>
<tr>
<td>15 years</td>
<td>Less than or equal to 10.76 ng/mL</td>
</tr>
<tr>
<td>16 years</td>
<td>Less than or equal to 12.94 ng/mL</td>
</tr>
<tr>
<td>17 years and older</td>
<td>Based on Cycle Days</td>
</tr>
<tr>
<td>1-6 days</td>
<td>Less than or equal to 0.17 ng/mL</td>
</tr>
<tr>
<td>7-12 days</td>
<td>Less than or equal to 1.35 ng/mL</td>
</tr>
<tr>
<td>13-15 days</td>
<td>Less than or equal to 15.63 ng/mL</td>
</tr>
<tr>
<td>16-28 days</td>
<td>Less than or equal to 25.55 ng/mL</td>
</tr>
<tr>
<td>Post-Menopausal</td>
<td>Less than or equal to 0.10 ng/mL</td>
</tr>
<tr>
<td>Pregnancy, First Trimester</td>
<td>6.25 - 45.46 ng/mL</td>
</tr>
<tr>
<td>Pregnancy, Second Trimester</td>
<td>15.40 - 52.10 ng/mL</td>
</tr>
<tr>
<td>Pregnancy, Third Trimester</td>
<td>24.99 - 99.92 ng/mL</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes: 
84144

LOINC: 
- 2839-9

COMPLETE VIEW

Ordering Recommendations: 
Aids in the workup of suspected infertility, detection of ovulation, and assessment of the luteal phase.

Test Code: 
PGSN

ARUP Test Code: 
2008509

Performing Lab: 
ARUP
Sendout: Yes

Performed: Sun-Sat

Methodology: Quantitative High Performance Liquid Chromatography-Tandem Mass Spectrometry

Collect: Serum Separator Tube (SST). Also acceptable: Plain Red, Pink (K₂EDTA), Plasma Separator Tube (PST), Green (Sodium Heparin), or Green (Lithium Heparin).

Amount to Collect: 2 mL blood

Sample Type: Serum

Preferred Volume: 1 mL serum

Minimum Volume: 0.3 mL serum

Unacceptable Conditions: Grossly hemolyzed specimens.

Specimen Preparation: Transfer 1 mL serum or plasma to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Additional Processing Instructions: Aliquot and freeze sample. Transport to CB frozen. Order ARUP test code 2008509.

Reference Interval:

Effective May 16, 2016

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
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<td>Less than 1 year</td>
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</tr>
<tr>
<td>1-16 years</td>
<td>Less than or equal to 0.15 ng/mL</td>
<td>Less than or equal to 0.26 ng/mL</td>
</tr>
<tr>
<td>17 years and older</td>
<td>Less than or equal to 0.11 ng/mL</td>
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</tr>
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</tr>
<tr>
<td>Pregnancy, First Trimester</td>
<td>3.25 - 45.48 ng/mL</td>
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<td>24.99 - 99.92 ng/mL</td>
<td>Pregnancy, Third Trimester</td>
</tr>
</tbody>
</table>

Synonyms: P4

Storage/Transport Temperature: Refrigerated. Also acceptable: Frozen.

Stability (from collection to initiation): After separation from cells: Ambient: Unacceptable; Refrigerated: 1 week; Frozen: 6 months.
Reported:

1-4 days

CPT Codes:

84144

LOINC:

- 2839-9
Progesterone, Pediatric
NPROG

ORDERING

Approval Required:
Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

Available Stat:
No

Performing Lab:
Quest

Methodology:
LC/MS/MS

Reported:
Test run 5x per week. Turnaround time: 6-8 days.

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Progesterone" (test code PROG). It requires approval if ordered in patients over the age of 20.

This test (1) establishes the presence of a functioning corpus luteum or luteal cell function, (2) confirms basal body temperature measurements of the occurrence of ovulation, (3) affords an indication of the day of ovulation, (4) assesses placental function during pregnancy.

Synonyms:
- Progesterone ultrasensitive

COLLECTION

Sample Type:
Serum

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen 2 years.

Unacceptable Conditions:
Collected in Gold top

PROCESSING

Test Code:
NPROG

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Refrigerate serum. Specify age, sex and menstrual phase and menopausal and pregnancy status on the request form. Order Quest # 17183

Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Collected in Gold top

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen 2 years.

RESULT INTERPRETATION

Reference Interval:
Males:
5-9 years <= 0.7 ng/mL
10-13 years <= 1.2 ng/mL
14-17 years <= 0.8 ng/mL
18-29 years <= 0.3 ng/mL
30-39 years <= 0.2 ng/mL
40-49 years <= 0.2 ng/mL
50-59 years <= 0.2 ng/mL

Females:
5-9 years 0.6 ng/mL
10-13 years 10.2 ng/mL
14-17 years 11.9 ng/mL
Early Follicular Phase <= 0.6 ng/mL
Late Follicular Phase <= 2.7 ng/mL
Mid-Cycle Phase <= 16.1 ng/mL
Luteal Phase <= 3.0-31.4 ng/mL
Postmenopausal Women <= 0.2 ng/mL

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see “Progesterone” (test code PROG). It requires approval if ordered in patients over the age of 20.

This test (1) establishes the presence of a functioning corpus luteum or luteal cell function, (2) confirms basal body temperature measurements of the occurrence of ovulation, (3) affords an indication of the day of ovulation, (4) assesses placental function during pregnancy.

ADMINISTRATIVE

CPT Codes:
84144-90

LOINC Codes:
2839-9

COMPLETE VIEW

Approval Required:
Yes, contact Chemistry/Immunology Resident at x3-1438. for patients > 20 years old.

Available Stat:
No

Test Code:
NPROG

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Refrigerate serum. Specify age, sex and menstrual phase and menopausal and pregnancy status on the request form. Order Quest # 17183

Reference Interval:
Males:
5-9 years  <= 0.7 ng/mL
10-13 years <= 1.2 ng/mL
14-17 years <= 0.8 ng/mL
18-29 years <= 0.3 ng/mL
30-39 years <= 0.2 ng/mL
40-49 years <= 0.2 ng/mL
50-59 years <= 0.2 ng/mL

Females:
5-9 years  0.6 ng/mL
10-13 years 10.2 ng/mL
14-17 years 11.9 ng/mL
Early Follicular Phase  <= 0.6 ng/mL
Late Follicular Phase  <= 2.7 ng/mL
Mid-Cycle Phase  <= 16.1 ng/mL
Luteal Phase  <= 3.0-31.4 ng/mL
Postmenopausal Women  <= 0.2 ng/mL

Synonyms:
- Progesterone ultrasensitive

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 4 weeks, frozen 2 years.

Reported:
Test run 5x per week. Turnaround time: 6-8 days.

Additional Information:
This send-out assay is primarily reserved for testing in pediatric patients with suspected or complex endocrine abnormalities. For adult patients see "Progesterone" (test code PROG). It requires approval if ordered in patients over the age of 20.

This test (1) establishes the presence of a functioning corpus luteum or luteal cell function, (2) confirms basal body temperature measurements of the occurrence of ovulation, (3) affords an indication of the day of ovulation, (4) assesses placental function during pregnancy.

CPT Codes:
84144-90

LOINC Codes:
2839-9
Proinsulin

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Immunochemiluminescent assay
Reported:
4-7 days
Additional Information:
Normal individuals will have proinsulin concentrations below the upper limit of the normal fasting reference range (20 pmol/L) when hypoglycemic (blood glucose <45-60 mg/dL). Conversely, most (>80%) insulinoma patients will have proinsulin concentrations above the upper limit of the reference range. The sensitivity and specificity for a diagnosis of insulinoma during hypoglycemia are approximately 75% and near 100%, respectively, at the 20 pmol/L cutoff. A higher sensitivity (>95%) can be achieved using a 5 pmol/L cutoff, and this is the cutoff recommended by the Mayo Clinic's highly experienced hypoglycemia team to avoid missing cases. However, the lower cutoff results in a reduced specificity (approximately 40%), emphasizing the need for a combination of different tests to assure accurate biochemical diagnosis.

Patients with PC1/3 deficiency have low, or sometimes undetectable, insulin levels and substantially elevated proinsulin levels, exceeding the upper limit of the reference range substantially in the fasting state and rising even higher after food intake. Many other hormonal abnormalities are also present, including cortisol deficiency (because of lack of processing of pro-opiomelanocortin to adrenocorticotropic hormone and other peptides), infertility and, often, morbid obesity.

This assay demonstrates no cross-reactivity with insulin or C-peptide.

A polyclonal capture antibody-conjugated bead recognizing human insulin is incubated with standards, controls and patient samples, capturing insulin and proinsulin, but not free C-peptide. Following washing, a polyclonal acridinium ester-labeled antiserum that recognizes C-peptide is added, binding to captured proinsulin, but not to captured insulin. After overnight incubation, the bead is washed, and flash-chemiluminescence is triggered and measured. The chemiluminescence signal is proportional to the concentration of proinsulin in the sample. (Kao PC, Taylor RT, Service FG: Proinsulin by novel ICMA-diagnostic implication for insulinoma. 75th Annual Meeting, Endocrine Society, #740, p 235, 1993; Kao PC, Taylor RT, Service FG: Proinsulin by immunochemiluminometric assay for the diagnosis of insulinoma. J Clin Endocrinol Metab 1994;78:1048-1051)

COLLECTION

Patient Preparation:
Overnight fasting before specimen collection is required.
Sample Type:
EDTA Plasma
Collect:
Lavender top (on ice)
Amount to Collect:
3 mL blood
Preferred Volume:
1.5 mL plasma
Minimum Volume:
1.0 mL plasma
Remarks:
Pre-chill lavender top in ice prior to collection. Transport sample to lab on ice immediately after collection.
Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20C 2 weeks.
Unacceptable Conditions:
Grossly hemolyzed or lipemic samples.
Rejection Criteria:
Sample received at room temperature, gross hemolysis or lipemcia

PROCESSING

Test Code:
PROINS
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Use refrigerated centrifuge to spin sample down. Aliquot 1.5 mL plasma into plastic vial and freeze at -20C. Transport frozen on dry ice.
Preferred Volume:
1.5 mL plasma
Minimum Volume:
1.0 mL plasma
Unacceptable Conditions:
Grossly hemolyzed or lipemic samples.
Rejection Criteria:
Sample received at room temperature, gross hemolysis or lipemcia
Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20C 2 weeks.

RESULT INTERPRETATION

Units:
pmol/L
Reference Interval:
3 - 20 pmol/L
Additional Information:
Normal individuals will have proinsulin concentrations below the upper limit of the normal fasting reference range (20 pmol/L) when hypoglycemic (blood glucose <45-60 mg/dL). Conversely, most (>80%) insulinoma patients will have proinsulin concentrations above the upper limit of the reference range. The sensitivity and specificity for a diagnosis of insulinoma during hypoglycemia are approximately 75% and near 100%, respectively, at the 20 pmol/L cutoff. A higher sensitivity (>95%) can be achieved using a 5 pmol/L cutoff, and this is the cutoff recommended by the Mayo Clinic's highly experienced hypoglycemia team to avoid missing cases. However, the lower cutoff results in a reduced specificity (approximately 40%), emphasizing the need for a combination of different tests to assure accurate biochemical diagnosis.

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This assay demonstrates no cross-reactivity with insulin or C-peptide.

A polyclonal capture antibody-conjugated bead recognizing human insulin is incubated with standards, controls and patient samples, capturing insulin and proinsulin, but not free C-peptide. Following washing, a polyclonal acridinium ester-labeled antiserum that recognizes C-peptide is added, binding to captured proinsulin, but not to captured insulin. After overnight incubation, the bead is washed, and flash-chemiluminescence is triggered and measured. The chemiluminescence signal is proportional to the concentration of proinsulin in the sample. (Kao PC, Taylor RT, Service FG: Proinsulin by novel ICMA-diagnostic implication for insulinoma. 75th Annual Meeting, Endocrine Society, #740, p 235, 1993; Kao PC, Taylor RT, Service FG: Proinsulin by immunochemiluminometric assay for the diagnosis of insulinoma. J Clin Endocrinol Metab 1994;78:1048-1051)

ADMINISTRATIVE

CPT Codes:
84206-90
LOINC Codes:
27882-0

COMPLETE VIEW

Available Stat:
No

Test Code:
PROINS

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Immunochemiluminescent assay

Patient Preparation:
Overnight fasting before specimen collection is required.

Remarks:
Pre-chill lavender top in ice prior to collection. Transport sample to lab on ice immediately after collection.

Collect:
Lavender top (on ice)

Amount to Collect:
3 mL blood

Sample Type:
EDTA Plasma

Preferred Volume:
1.5 mL plasma

Minimum Volume:
1.0 mL plasma

Rejection Criteria:
Sample received at room temperature, gross hemolysis or lipemia

Unacceptable Conditions:
Grossly hemolyzed or lipemic samples.

Specimen Preparation:
Use refrigerated centrifuge to spin sample down. Aliquot 1.5 mL plasma into plastic vial and freeze at -20C. Transport frozen on dry ice.

Units:
pmol/L

Reference Interval:
3 - 20 pmol/L

Stability (from collection to initiation):
Refrigerated 1 week, frozen at -20C 2 weeks.

Reported:
4-7 days

Additional Information:
Normal individuals will have proinsulin concentrations below the upper limit of the normal fasting reference range (20 pmol/L) when hypoglycemic (blood glucose <45-60 mg/dL). Conversely, most (>80%) insulinoma patients will have proinsulin concentrations above the upper limit of the reference range. The sensitivity and specificity for a diagnosis of insulinoma during hypoglycemia are approximately 75% and near 100%, respectively, at the 20 pmol/L cutoff. A higher sensitivity (>95%) can be achieved using a 5 pmol/L cutoff, and this is the cutoff recommended by the Mayo Clinic's highly experienced hypoglycemia team to avoid missing cases. However, the lower cutoff results in a reduced specificity (approximately 40%), emphasizing the need for a combination of different tests to assure accurate biochemical diagnosis.

Patients with PC1/3 deficiency have low, or sometimes undetectable, insulin levels and substantially elevated proinsulin levels, exceeding the upper limit of the reference range substantially in the fasting state and rising even higher after food intake. Many other hormonal abnormalities are also present, including cortisol deficiency (because of lack of processing of pro-opiomelanocortin to adrenocorticotropic hormone and other peptides), infertility and, often, morbid obesity.
This assay demonstrates no cross-reactivity with insulin or C-peptide.

A polyclonal capture antibody-conjugated bead recognizing human insulin is incubated with standards, controls and patient samples, capturing insulin and proinsulin, but not free C-peptide. Following washing, a polyclonal acridinium ester-labeled antiserum that recognizes C-peptide is added, binding to captured proinsulin, but not to captured insulin. After overnight incubation, the bead is washed, and flash-chemiluminescence is triggered and measured. The chemiluminescence signal is proportional to the concentration of proinsulin in the sample. (Kao PC, Taylor RT, Service FG: Proinsulin by novel ICMA-diagnostic implication for insulinoma. 75th Annual Meeting, Endocrine Society, #740, p 235, 1993; Kao PC, Taylor RT, Service FG: Proinsulin by immunochemiluminometric assay for the diagnosis of insulinoma. J Clin Endocrinol Metab 1994;78:1048-1051)

CPT Codes:

84206-90

LOINC Codes:

27882-0
### Prolactin

**PROL**

#### ORDERING

**Available Stat:**  
No

**Performing Lab:**  
China Basin Chemistry

**Performed:**  
Thursday, Sunday (day shift)

**Methodology:**  
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

**Reported:**  
1-3 days

**Additional Information:**  
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 1/8/18. The Abbott Architect method reads approximately 23% higher than the Centaur method. Please note that the reference ranges have changed.


Levels in newborns are > 10x those in adults. Levels in menstruating or post-menopausal women do not differ greatly from random levels in females.

Note-Prolactin immunoassays vary in sensitivity to the presence of macroprolactin (Reference 1). Macroprolactin, a high molecular weight aggregate of monomeric prolactin and immunoglobulin, is estimated to be present in 5-25% of hyperprolactinemic patients (Reference 1, 2). Although the precise biologic role of macroprolactin remains unclear, patients with hyperprolactinemia due to macroprolactin often respond to treatment with dopamine agonists (Reference 2). Clinicians should be aware that there may be inter-laboratory variation in reported values of prolactin due to the different sensitivities of commercial immunoassays to the presence of macroprolactin.

Assay for macroprolactin using the PEG precipitation procedure is available by sendout of 0.4 ml of serum to Quest (Test code: MACPRO)

**References**


#### COLLECTION

**Sample Type:**  
Serum

**Collect:**  
Gold or red top preferred.

Dark green or light green acceptable.

**Amount to Collect:**  
1 mL blood

**Preferred Volume:**  
0.3 mL serum

**Minimum Volume:**  
0.15 mL serum

**Remarks:**

---

Printed 06/07/19  
Test information subject to change
Because of circadian changes in prolactin secretion, with peaks at night and in the afternoon, specimens should be drawn at the same time of day for comparability, preferably after fasting overnight.

**Stability (from collection to initiation):**

- Refrigerated (2-8°C): 7 days
- Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

---

**PROCESSING**

**Test Code:**

PROL

**Test Group:**

Prolactin

**Performing Lab:**

China Basin Chemistry

**Specimen Preparation:**

Aliquot and freeze serum at -20°C.

**Preferred Volume:**

0.3 mL serum

**Minimum Volume:**

0.15 mL serum

**Stability (from collection to initiation):**

- Refrigerated (2-8°C): 7 days
- Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

---

**RESULT INTERPRETATION**

**Units:**

µg/L

**Reference Interval:**

Adult Reference Range (>= 18 years):

<table>
<thead>
<tr>
<th>Gender</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>4.3 - 30.0 ug/L</td>
</tr>
<tr>
<td>Male</td>
<td>3.6 - 18.0 ug/L</td>
</tr>
</tbody>
</table>

Adult reference range adopted from Abbott (vendor) based on in-house verification studies of 23 male and 22 female (18 years old) normal volunteers in the UCSF Laboratory.

Pediatric Reference Range:

<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 days - 29 days</td>
<td>12.6 - 212.8</td>
</tr>
<tr>
<td>30 days - &lt;1 year</td>
<td>8.3 - 113.7</td>
</tr>
<tr>
<td>1 year - &lt;18 years</td>
<td>4.2 - 23.0</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

**Additional Information:**

Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 1/8/18. The Abbott Architect method reads approximately 23% higher than the Centaur method. Please note that the reference ranges have changed.

Levels in newborns are > 10x those in adults. Levels in menstruating or post-menopausal women do not differ greatly from random levels in females.

Note—Prolactin immunoassays vary in sensitivity to the presence of macroprolactin (Reference 1). Macroprolactin, a high molecular weight aggregate of monomeric prolactin and immunoglobulin, is estimated to be present in 5-25% of hyperprolactinemic patients (Reference 1, 2). Although the precise biologic role of macroprolactin remains unclear, patients with hyperprolactinemia due to macroprolactin often respond to treatment with dopamine agonists (Reference 2). Clinicians should be aware that there may be inter-laboratory variation in reported values of prolactin due to the different sensitivities of commercial immunoassays to the presence of macroprolactin.

Assay for macroprolactin using the PEG precipitation procedure is available by sendout of 0.4 ml of serum to Quest (Test code: MACPRO)

References


ADMINISTRATIVE

CPT Codes:
84146

LOINC Codes:
2842-3

COMPLETE VIEW

Available Stat:
No

Test Code:
PROL

Test Group:
Prolactin

Performing Lab:
China Basin Chemistry

Performed:
Thursday, Sunday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Remarks:
Because of circadian changes in prolactin secretion, with peaks at night and in the afternoon, specimens should be drawn at the same time of day for comparability, preferably after fasting overnight.

Collect:
Gold or red top preferred.
Dark green or light green acceptable.

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.3 mL serum
Minimum Volume:
0.15 mL serum

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Units:
µg/L

Reference Interval:
Adult Reference Range (>= 18 years):

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>4.3 - 30.0 ug/L</td>
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<td>4.2 - 23.0</td>
</tr>
</tbody>
</table>

Pediatric reference ranges adopted from CALIPER Pediatric Reference Interval study performed on random samples using the Abbott Architect i2000 assay.

Stability (from collection to initiation):
Refrigerated (2-8°C): 7 days
Frozen (-10°C or colder): 12 months

If testing will be delayed more than 24 hours, remove serum from clot, red blood cells, or serum separator gel.

Avoid multiple freeze-thaw cycles.

Reported:
1-3 days

Additional Information:
Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 1/8/18. The Abbott Architect method reads approximately 23% higher than the Centaur method. Please note that the reference ranges have changed.


Levels in newborns are > 10x those in adults. Levels in menstruating or post-menopausal women do not differ greatly from random levels in females.

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Assay for macroprolactin using the PEG precipitation procedure is available by sendout of 0.4 ml of serum to Quest (Test code: MACPRO).

References

CPT Codes:
84146

LOINC Codes:
2842-3
Prolactin-Insulin Stimulation Test

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
China Basin Chemistry

**Performed:**
Monday, Wednesday, Friday (day shift)

**Methodology:**
MEIA

**Reported:**
1-3 days

**Additional Information:**
See notes for Prolactin

**COLLECTION**

**Sample Type:**
Serum or plasma

**Collect:**
Gold top or Light Green top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

**Remarks:**
After collecting a basal specimen, Insulin is administered and additional specimens are collected 30, 45 and 60 minutes later for Prolactin assay. Record the collection time on the requisition and tube for each sample.

**PROCESSING**

**Test Group:**
Prolactin

**Performing Lab:**
China Basin Chemistry

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

**RESULT INTERPRETATION**

**Reference Interval:**
Post-Stimulation peak: >= 2x basal

**Additional Information:**
See notes for Prolactin

**COMPLETE VIEW**
Available Stat: No
Test Group: Prolactin
Performing Lab: China Basin Chemistry
Performed: Monday, Wednesday, Friday (day shift)
Methodology: MEIA
Remarks: After collecting a basal specimen, Insulin is administered and additional specimens are collected 30, 45 and 60 minutes later for Prolactin assay. Record the collection time on the requisition and tube for each sample.
Collect: Gold top or Light Green top
Amount to Collect: 2 mL blood
Sample Type: Serum or plasma
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Reference Interval: Post-Stimulation peak: >= 2x basal
Reported: 1-3 days
Additional Information: See notes for Prolactin
Prolactin-TRH Stimulation Test

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Monday, Wednesday, Friday (day shift)
Methodology: MEIA
Reported: 1-3 days
Additional Information: See notes for Prolactin

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Remarks: After collecting a basal specimen, TRH is administered and additional specimens are collected 15, 30 and 60 minutes later for Prolactin assay. Record the collection time for each sample on the requisition and tube.

PROCESSING

Test Group: Prolactin
Performing Lab: China Basin Chemistry
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma

RESULT INTERPRETATION

Reference Interval: Post-Stimulation peak: >= 2x basal
Additional Information: See notes for Prolactin
Available Stat: No
Test Group: Prolactin
Performing Lab: China Basin Chemistry
Performed: Monday, Wednesday, Friday (day shift)
Methodology: MEIA
Remarks: After collecting a basal specimen, TRH is administered and additional specimens are collected 15, 30 and 60 minutes later for Prolactin assay. Record the collection time for each sample on the requisition and tube.
Collect: Gold top or Light Green top
Amount to Collect: 2 mL blood
Sample Type: Serum or plasma
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Reference Interval: Post-Stimulation peak: >= 2x basal
Reported: 1-3 days
Additional Information: See notes for Prolactin
Prostate Specific Antigen, Free
FPSA

ORDERING

Ordering Recommendations:
Although generally recommended for patients with Total PSA values between 4.0-10.0 µg/L the laboratory will accept requests for patients with Total PSA as low as 2.5 µg/L without approval.

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Thursday (day shift)

Methodology:
Chemiluminescent Immunoassay (Abbott Architect i2000)

Reported:
1-8 days

Additional Information:
Includes PSA, Total.


Use of the test is based upon the claim of Catalona et al (JAMA 1995;274:1214) that when PSA levels are in the range of 4.1-10.0 µg/L, a higher proportion of free PSA identifies the patient with a relatively lower likelihood that a biopsy will show cancer.

In patients with Total PSA of 4-10 µg/L:

Free PSA Probability of Cancer
0-10%  56%
10-15%  28%
15-20%  20%
20-25%  16%
>25%  8%

Synonyms:
• Free PSA

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

PROCESSING

Test Code:
FPSA

Test Group:
PSA
Performing Lab:
China Basin Chemistry

Specimen Preparation:
Freeze serum at -20°C

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION

Units:
%

Reference Interval:
See Additional Information

Additional Information:
Includes PSA, Total.


Use of the test is based upon the claim of Catalona et al (JAMA 1995;274:1214) that when PSA levels are in the range of 4.1-10.0 µg/L, a higher proportion of free PSA identifies the patient with a relatively lower likelihood that a biopsy will show cancer.

In patients with Total PSA of 4-10 µg/L:

<table>
<thead>
<tr>
<th>Free PSA Probability of Cancer</th>
<th>0-10%</th>
<th>10-15%</th>
<th>15-20%</th>
<th>20-25%</th>
<th>&gt; 25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probability of Cancer</td>
<td>56%</td>
<td>28%</td>
<td>20%</td>
<td>16%</td>
<td>8%</td>
</tr>
</tbody>
</table>

ADMINISTRATIVE

CPT Codes:
84153

LOINC Codes:
12841-3

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Although generally recommended for patients with Total PSA values between 4.0-10.0 µg/L the laboratory will accept requests for patients with Total PSA as low as 2.5 µg/L without approval.

Test Code:
FPSA

Test Group:
PSA

Performing Lab:
China Basin Chemistry

Performed:
Thursday (day shift)

Methodology:
Chemiluminescent Immunoassay (Abbott Architect i2000)
Collect:
  Gold top

**Amount to Collect:**
  2 mL blood

**Sample Type:**
  Serum

**Preferred Volume:**
  1 mL serum

**Minimum Volume:**
  0.5 mL serum

**Specimen Preparation:**
  Freeze serum at -20°C

**Units:**
  %

**Reference Interval:**
  See Additional Information

**Synonyms:**
  • Free PSA

**Reported:**
  1-8 days

**Additional Information:**
  Includes PSA, Total.


Use of the test is based upon the claim of Catalona et al (JAMA 1995;274:1214) that when PSA levels are in the range of 4.1-10.0 µg/L, a higher proportion of free PSA identifies the patient with a relatively lower likelihood that a biopsy will show cancer.

In patients with Total PSA of 4-10 µg/L:

Free PSA Probability of Cancer

<table>
<thead>
<tr>
<th>Range</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10%</td>
<td>56%</td>
</tr>
<tr>
<td>10-15%</td>
<td>28%</td>
</tr>
<tr>
<td>15-20%</td>
<td>20%</td>
</tr>
<tr>
<td>20-25%</td>
<td>16%</td>
</tr>
<tr>
<td>&gt; 25%</td>
<td>8%</td>
</tr>
</tbody>
</table>

**CPT Codes:**
  84153

**LOINC Codes:**
  12841-3
Prostate Specific Antigen, Total
PSAS, PRSA

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday-Friday (day shift)
Methodology:
Chemiluminescent Immunoassay-Abbott Architect i2000
Reported:
1-3 days
Additional Information:
The test can detect levels as low as 0.015 µg/L as an index of early recurrence of carcinoma after radical prostatectomy. Lower levels are reported as “< 0.015 µg/L”.

PSAS: For annual screening in Medicare patients over age 49. At least 11 months must have elapsed following the month in which the most recent Medicare-covered test was performed. Because the laboratory cannot know with certainty when the most recent test was performed, including testing at other laboratories, the patient will be asked to sign an Advanced Beneficiary Notice or a Hospital Notice of Non-Coverage agreeing to financial liability if payment is refused by Medicare.

PRSA: For screening Non-Medicare patients and monitoring patients after prostatectomy.

The most recent estimates of Prostate cancer probability (JAMA 1997;277:1214 and 1998;279:1542) are:
Total PSA Probability of Cancer
0-2 µg/L  1%
2-4 µg/L  15%
4-10 µg/L  25%
>10 µg/L  >50%

Percent (%) of apparently healthy patients with PSA values at the following levels:
Healthy Subjects (# tested) <4.0 µg/L 4-10 µg/L 10-30 µg/L 30-60 µg/L >60 µg/L
Females (296) 100.0 0.0 0.0 0.0 0.0
Males Ages 40 - 49 (99) 100.0 0.0 0.0 0.0 0.0
Males Ages 50 - 59 (120) 97.5 2.5 0.0 0.0 0.0
Males Ages 60 - 69 (123) 93.5 6.5 0.0 0.0 0.0
Males Ages 70 - 79 (124) 91.9 7.3 0.8 0.0 0.0

In this study, 95.5% of the specimens from apparently healthy male subjects (n=466) had values of 4.0 ng/mL or less.

* from Abbott reagent insert; Values developed for the ARCHITECT i2000 analyzer.

Synonyms:
• PSA

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
1 mL blood
Preferred Volume:
**PROCESSING**

**Test Code:**
- PSAS, PRSA

**Test Group:**
- PSA

**Performing Lab:**
- China Basin Chemistry

**Specimen Preparation:**
- Refrigerate

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**RESULT INTERPRETATION**

**Units:**
- µg/L

**Reference Interval:**
- Males 40 years of age and above: <4.00 ug/L.

- Vendor reference range verified in-house by running 75 random male samples 40 years of age and older collected from outpatient settings.

- See also 'Additional Information'

**Additional Information:**

- The test can detect levels as low as 0.015 µg/L as an index of early recurrence of carcinoma after radical prostatectomy. Lower levels are reported as "< 0.015 µg/L".

- PSAS: For annual screening in Medicare patients over age 49. At least 11 months must have elapsed following the month in which the most recent Medicare-covered test was performed. Because the laboratory cannot know with certainty when the most recent test was performed, including testing at other laboratories, the patient will be asked to sign an Advanced Beneficiary Notice or a Hospital Notice of Non-Coverage agreeing to financial liability if payment is refused by Medicare.

- PRSA: For screening Non-Medicare patients and monitoring patients after prostatectomy.

The most recent estimates of Prostate cancer probability (JAMA 1997;277:1214 and 1998;279:1542) are:

<table>
<thead>
<tr>
<th>Total PSA Probability of Cancer</th>
<th>0-2 µg/L</th>
<th>2-4 µg/L</th>
<th>4-10 µg/L</th>
<th>&gt;10 µg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1%</td>
<td>15%</td>
<td>25%</td>
<td>&gt;50%</td>
</tr>
</tbody>
</table>

Percent (%) of apparently healthy patients with PSA values at the following levels:

<table>
<thead>
<tr>
<th>Healthy Subjects (# tested)</th>
<th>&lt;4.0 µg/L</th>
<th>4-10 µg/L</th>
<th>10-30 µg/L</th>
<th>30-60 µg/L</th>
<th>&gt;60 µg/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females (296)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
</tr>
<tr>
<td>Males Ages 40 - 49 (99)</td>
<td>100.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Males Ages 50 - 59 (120)</td>
<td>97.5</td>
<td>2.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Males Ages 60 - 69 (123)</td>
<td>93.5</td>
<td>6.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Males Ages 70 - 79 (124)</td>
<td>91.9</td>
<td>7.3</td>
<td>0.8</td>
<td>0.0</td>
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</tr>
</tbody>
</table>

In this study, 95.5% of the specimens from apparently healthy male subjects (n=466) had values of 4.0 ng/mL or less.
* from Abbott reagent insert; Values developed for the ARCHITECT i2000 analyzer.

**ADMINISTRATIVE**

CPT Codes:

84153

**COMPLETE VIEW**

Available Stat:

No

Test Code:

PSAS, PRSA

Test Group:

PSA

Performing Lab:

China Basin Chemistry

Performed:

Monday-Friday (day shift)

Methodology:

Chemiluminescent Immunoassay-Abbott Architect i2000

Collect:

Gold top or Red top

Amount to Collect:

1 mL blood

Sample Type:

Serum

Preferred Volume:

0.5 mL serum

Minimum Volume:

0.3 mL serum

Specimen Preparation:

Refrigerate

Units:

µg/L

Reference Interval:

Males 40 years of age and above: <4.00 ug/L.

Vendor reference range verified in-house by running 75 random male samples 40 years of age and older collected from outpatient settings.

See also 'Additional Information'

Synonyms:

- PSA

Reported:

1-3 days

Additional Information:

The test can detect levels as low as 0.015 µg/L as an index of early recurrence of carcinoma after radical prostatectomy. Lower levels are reported as "< 0.015 µg/L".

PSAS: For annual screening in Medicare patients over age 49. At least 11 months must have elapsed following the month in which the most recent Medicare-covered test was performed. Because the laboratory cannot know with certainty when the most recent test was performed, including testing at other laboratories, the patient will be asked to sign an Advanced Beneficiary Notice or a Hospital Notice of Non-Coverage agreeing to financial liability if payment is refused by Medicare.

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<tr>
<td>Probability of Cancer</td>
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Percent (%) of apparently healthy patients with PSA values at the following levels:

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</tbody>
</table>

In this study, 95.5% of the specimens from apparently healthy male subjects (n=466) had values of 4.0 ng/mL or less.

* from Abbott reagent insert; Values developed for the ARCHITECT i2000 analyzer.

CPT Codes:

84153
Prostatic Acid Phosphatase
ACPP

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: DPC Chemiluminescence
Reported: Test performed Monday, Wednesday, Friday. AM. Turnaround time: 3-4 days.
Additional Information:
- Having largely been made obsolete by the advent of the assay for Prostate Specific Antigen (PSA).
- Metastatic bone disease usually increases alkaline phosphatase, rather than acid phosphatase levels.
- Samples should be collected prior to rectal examination or biopsy, which may induce false-positive elevations.
- PAP levels determined by different messages are not comparable

Synonyms:
- PAP
- Acid phosphatase, Prostatic
- Acid Ptase
- Prostatic fraction

COLLECTION

Sample Type: Serum
Collect:
- Gold top, Red top
Amount to Collect:
- 2 mL blood
Preferred Volume:
- 1 mL serum
Minimum Volume:
- 0.3 mL serum
Stability (from collection to initiation):
- Refrigerated 5 days, frozen -20C 1 year.
Rejection Criteria:
- Room Temp sample

PROCESSING

Test Code: ACPP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
- Freeze serum at -20C Order Quest # 17145P

Test information subject to change
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Rejection Criteria: Room Temp sample
Stability (from collection to initiation): Refrigerated 5 days, frozen -20°C 1 year.

RESULT INTERPRETATION

Units: ng/mL
Reference Interval: <2.8 ng/mL
Additional Information:
- Having largely been made obsolete by the advent of the assay for Prostate Specific Antigen (PSA).
- Metastatic bone disease usually increases alkaline phosphatase, rather than acid phosphatase levels.
- Samples should be collected prior to rectal examination or biopsy, which may induce false-positive elevations.
- PAP levels determined by different messages are not comparable.

ADMINISTRATIVE

CPT Codes: 84066-90
LOINC Codes: 20420-6

COMPLETE VIEW

Available Stat: No
Test Code: ACPP
Performing Lab: Quest
Sendout: Yes
Methodology: DPC Chemiluminescence
Collect: Gold top, Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Rejection Criteria: Room Temp sample
Specimen Preparation:
Freeze serum at -20C Order Quest # 17145P

Units:
ng/mL

Reference Interval:
<2.8 ng/mL

Synonyms:
- PAP
- Acid phosphatase, Prostatic
- Acid Ptase
- Prostatic fraction

Stability (from collection to initiation):
Refrigerated 5 days, frozen -20C 1 year.

Reported:
Test performed Monday, Wednesday, Friday. AM. Turnaround time: 3-4 days.

Additional Information:
Having largely been made obsolete by the advent of the assay for Prostate Specific Antigen (PSA).

Metastatic bone disease usually increases alkaline phosphatase, rather than acid phosphatase levels.

Samples should be collected prior to rectal examination or biopsy, which may induce false-positive elevations.

PAP levels determined by different messages are not comparable

CPT Codes:
84066-90

LOINC Codes:
20420-6
Protein C, Activity

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology
Reported:
2-4 weeks
Additional Information:
Results may be altered by coumadin like Rx and presence of Aprotinin.
A low level of protein C may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, and L-asparaginase therapy.
Aprotinin in the sample can result in under-estimation of the protein C level.
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
Patient should not be receiving aprotinin which will result in underestimation of Protein C.
If "Protein C" is requested without further specification a protein C activity will be performed.
For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
PRC
Test Group:
Protein C
Performing Lab:
Parnassus Hematology

Specimen Preparation:
Deliver sample asap to Hematology for processing.

Test specimens within four hours of collection or freeze plasma in a plastic tube at -20C.

If Protein C Antigen is ordered on the same specimen, 4.5 mL suffices for both tests.

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
%

Reference Interval:
>16 years 76-146%

Normal range >16 years 76-146%

There is no published pediatric reference range for Protein C activity, which generally parallels the level of Protein C Antigen. We have included normal ranges below for pediatrics based on antigen levels which should roughly correlate with activity.

Full term infant:
Day 1  Day 5  Day 30  Day 90  Day 180
17-53% 20-64% 21-65% 28-80% 37-81%


Healthy Premature infant:
Day 1  Day 5  Day 30  Day 90  Day 180
12-44% 11-51% 15-59% 23-67% 31-83%


Child:
1-5 years 6-10 years 11-16 years
40-92% 45-93% 55-111%


Additional Information:
Results may be altered by coumadin like Rx and presence of Aprotinin.

A low level of protein C may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, and L-asparaginase therapy.

Aprotinin in the sample can result in under-estimation of the protein C level.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for
CPT Codes:
85303
LOINC Codes:
27819-2

**COMPLETE VIEW**

Available Stat:
No
Test Code:
PRC
Test Group:
Protein C
Performing Lab:
Parnassus Hematology
Remarks:

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Patient should not be receiving aprotinin which will result in underestimation of Protein C.

If "Protein C" is requested without further specification a protein C activity will be performed.

For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma
Prefered Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Deliver sample asap to Hematology for processing.

Test specimens within four hours of collection or freeze plasma in a plastic tube at -20C.

If Protein C Antigen is ordered on the same specimen, 4.5 mL suffices for both tests.

Units:
%

Reference Interval:

>16 years 76-146%
Normal range >16 years 76-146%

There is no published pediatric reference range for Protein C activity, which generally parallels the level of Protein C Antigen. We have included normal ranges below for pediatrics based on antigen levels which should roughly correlate with activity.
Full term infant:
Day 1  Day 5  Day 30  Day 90  Day 180
17-53%  20-64%  21-65%  28-80%  37-81%


Healthy Premature infant:
Day 1  Day 5  Day 30  Day 90  Day 180
12-44%  11-51%  15-59%  23-67%  31-83%


Child:
1-5 years  6-10 years  11-16 years
40-92%  45-93%  55-111%


**Reported:**
2-4 weeks

**Additional Information:**
Results may be altered by coumadin like Rx and presence of Aprotinin.

A low level of protein C may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, and L-asparaginase therapy.

Aprotinin in the sample can result in under-estimation of the protein C level.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
85303

**LOINC Codes:**
27819-2
Protein C, Antigen
PRCI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzyme Immunoassay
Reported:
4-8 days
Additional Information:

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

If "Protein C" is requested without further specification a protein C activity will be performed.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
PRCI
Test Group:
Protein C
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Deliver sample to Hematology ASAP for processing.

Freeze plasma in 1 mL aliquots at -20C.
Ship on dry ice Monday-Friday to Quest, test code 4948.

For B & T patients ship on dry ice to LabCorp, test # 080465.

If "Protein C" is requested without further specification, a Protein C activity (PRC) should be ordered.

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Unacceptable Conditions:**
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**RESULT INTERPRETATION**

**Units:**
%

**Reference Interval:**
- 0-1 day: 17-53%
- 2-5 days: 20-64%
- 6-30 days: 21-65%
- 31-90 days: 28-80%
- 91-180 days: 37-81%
- >= 18 year olds: 70-140%

**Additional Information:**

**ADMINISTRATIVE**

**CPT Codes:**
- 85302-90

**LOINC Codes:**
- 27820-0

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
PRCI

**Test Group:**
Protein C

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Enzyme Immunoassay

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

If "Protein C" is requested without further specification a protein C activity will be performed.
Collect:
  Blue top filled to full extent of vacuum

Amount to Collect:
  2.7 mL blood

Sample Type:
  Citrated plasma

Preferred Volume:
  1 mL plasma

Minimum Volume:
  0.5 mL plasma

Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
  Deliver sample to Hematology ASAP for processing.
  Freeze plasma in 1 mL aliquots at -20C.
  Ship on dry ice Monday-Friday to Quest, test code 4948.
  For B &T patients ship on dry ice to LabCorp, test # 080465.

  If "Protein C" is requested without further specification, a Protein C activity (PRC) should be ordered.

Units:
  %

Reference Interval:
  0-1 day  17-53%
  2-5 days  20-64%
  6-30 days  21-65%
  31-90 days  28-80%
  91-180 days  37-81%
  >= 18 year olds  70-140%

Reported:
  4-8 days

Additional Information:

CPT Codes:
  85302-90

LOINC Codes:
  27820-0
**Protein Electrophoresis, serum**

**ORDERING**

**Available Stat:**

No

**Performing Lab:**

China Basin Chemistry

**Performed:**

Monday-Friday (day shift) as needed

**Methodology:**

Electrophoresis by Helena SPIFE4000

**Reported:**

1-3 days

**Additional Information:**

Method changed from Sebia Capillaries to SPIFE 4000 for samples collected after June 24, 2018. In samples with monoclonal (M) protein spikes with concentrations between 0.1 g/dL to 2.5 g/dL, there is no significant difference in M spike results between the two instruments. For M spikes greater than 2.5 g/dL, the new SPIFE 4000 instrument produces values about 10 - 15% lower than the old Sebia Capillaries instrument. Reference ranges for the different protein fractions have been updated with introduction of the new instrument.

Total Protein is automatically included in test request.

Most monoclonal cryoglobulins are detected by serum electrophoresis, but if cryoglobulins are suspected and the PEP is normal, order Cryoglobulin, Quantitative. Most monoclonal proteins are also detected by electrophoresis, but if negative in a patient with a high suspicion of a monoclonal gammopathy it may be detectable by immunofixation electrophoresis or by free light chain immunoassay.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**Synonyms:**

- SPEP
- PEP
- paraprotein

**COLLECTION**

**Sample Type:**

Serum

**Collect:**

Gold top

**Amount to Collect:**

2 mL blood

**Preferred Volume:**

1 mL serum

**Minimum Volume:**

0.3 mL serum

**Stability (from collection to initiation):**

Room Temp (15-30°C): 4 days
Refrigerated (2-8°C): 2 weeks
Frozen (-20°C or colder): 6 months

**Unacceptable Conditions:**

Plasma sample received

**PROCESSING**
Test Code: PE
Performing Lab: China Basin Chemistry
Specimen Preparation: Refrigerate serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions: Plasma sample received
Stability (from collection to initiation):
- Room Temp (15-30°C): 4 days
- Refrigerated (2-8°C): 2 weeks
- Frozen (-20°C or colder): 6 months

RESULT INTERPRETATION

Units: g/dL
Reference Interval:
For Patients >= 1 year old:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval (g/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>3.4 - 4.7</td>
</tr>
<tr>
<td>Alpha-1 Globulins</td>
<td>0.1 - 0.3</td>
</tr>
<tr>
<td>Alpha-2 Globulins</td>
<td>0.6 - 1.0</td>
</tr>
<tr>
<td>Beta Globulins</td>
<td>0.7 - 1.4</td>
</tr>
<tr>
<td>Gamma Globulins</td>
<td>0.6 - 1.6</td>
</tr>
</tbody>
</table>

Note: Reference intervals are not available for patients < 1 year old. Results should read lower due to a lower total protein in patients who are < 1 year old.

Reference ranges are adopted from MAYO Medical Laboratories reference ranges with minor modifications for the beta fraction with verification by testing in 22 normal volunteers.

Additional Information:
Method changed from Sebia Capillaries to SPIFE 4000 for samples collected after June 24, 2018. In samples with monoclonal (M) protein spikes with concentrations between 0.1 g/dL to 2.5 g/dL, there is no significant difference in M spike results between the two instruments. For M spikes greater than 2.5 g/dL, the new SPIFE 4000 instrument produces values about 10 - 15% lower than the old Sebia Capillaries instrument. Reference ranges for the different protein fractions have been updated with introduction of the new instrument.

Total Protein is automatically included in test request.

Most monoclonal cryoglobulins are detected by serum electrophoresis, but if cryoglobulins are suspected and the PEP is normal, order Cryoglobulin, Quantitative. Most monoclonal proteins are also detected by electrophoresis, but if negative in a patient with a high suspicion of a monoclonal gammopathy it may be detectable by immunofixation electrophoresis or by free light chain immunoassay.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

ADMINISTRATIVE

CPT Codes: 84165
LOINC Codes:
COMPLETE VIEW

Available Stat:
No
Test Code:
PE
Performing Lab:
China Basin Chemistry
Performed:
Monday-Friday (day shift) as needed
Methodology:
Electrophoresis by Helena SPIFE4000
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Plasma sample received
Specimen Preparation:
Refrigerate serum
Units:
g/dL
Reference Interval:
For Patients >= 1 year old:

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval (g/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>3.4 - 4.7</td>
</tr>
<tr>
<td>Alpha-1 Globulins</td>
<td>0.1 - 0.3</td>
</tr>
<tr>
<td>Alpha-2 Globulins</td>
<td>0.6 - 1.0</td>
</tr>
<tr>
<td>Beta Globulins</td>
<td>0.7 - 1.4</td>
</tr>
<tr>
<td>Gamma Globulins</td>
<td>0.6 - 1.6</td>
</tr>
</tbody>
</table>

Note: Reference intervals are not available for patients < 1 year old. Results should read lower due to a lower total protein in patients who are < 1 year old.

Reference ranges are adopted from MAYO Medical Laboratories reference ranges with minor modifications for the beta fraction with verification by testing in 22 normal volunteers.

Synonyms:
- SPEP
- PEP
- paraprotein

Stability (from collection to initiation):
Room Temp (15-30°C): 4 days
Refrigerated (2-8°C): 2 weeks
Frozen (-20°C or colder): 6 months

Reported:
1-3 days

Additional Information:
Method changed from Sebia Capillaries to SPIFE 4000 for samples collected after June 24, 2018. In samples with monoclonal (M) protein spikes with concentrations between 0.1 g/dL to 2.5 g/dL, there is no significant difference in M spike results between the two instruments. For M spikes greater than 2.5 g/dL, the new SPIFE 4000 instrument produces values about 10 - 15% lower than the old Sebia Capillaries instrument. Reference ranges for the different protein fractions have been updated with introduction of the new instrument.

Total Protein is automatically included in test request.

Most monoclonal cryoglobulins are detected by serum electrophoresis, but if cryoglobulins are suspected and the PEP is normal, order Cryoglobulin, Quantitative. Most monoclonal proteins are also detected by electrophoresis, but if negative in a patient with a high suspicion of a monoclonal gammopathy it may be detectable by immunofixation electrophoresis or by free light chain immunoassay.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
- 84165

LOINC Codes:
- 12851-2
Protein Electrophoresis, urine
PEU

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday-Friday (day shift) as needed
Methodology:
Electrophoresis
Reported:
1-3 days
Additional Information:
A Total Protein is performed on the same sample and will be reported and billed separately. This test screens for Light Chains (Bence-Jones protein), the presence of which may indicate the need for immunofixation. The Laboratory Medicine resident will consult the ordering physician.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
Synonyms:
- PEP
- UPEP
- Albumin
- paraprotein

COLLECTION

Sample Type:
24 hour urine collection or random urine
Collect:
24 hour urine collection container or urine cup
Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)
Preferred Volume:
10 mL urine
Minimum Volume:
6 mL urine
Remarks:
Refrigerate 24 hour collection container during collection
Stability (from collection to initiation):
Refrigerated 1 week
Unacceptable Conditions:
Container not refrigerated during collection.

PROCESSING

Test Code:
PEU
Test Group:
Capillary Electrophoresis by Sebia Capillaries 2 Flex
Performing Lab:
China Basin Chemistry

Specimen Preparation:
Order PEU and TPUR for spot urines. Order PEU, TPU and AAUV for timed urines.

Preferred Volume:
10 mL urine

Minimum Volume:
6 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

Stability (from collection to initiation):
Refrigerated 1 week

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
A Total Protein is performed on the same sample and will be reported and billed separately. This test screens for Light Chains (Bence-Jones protein), the presence of which may indicate the need for immunofixation. The Laboratory Medicine resident will consult the ordering physician.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

ADMINISTRATIVE

CPT Codes:
84166

LOINC Codes:
13438-7

COMPLETE VIEW

Available Stat:
No

Test Code:
PEU

Test Group:
Capillary Electrophoresis by Sebia Capillaries 2 Flex

Performing Lab:
China Basin Chemistry

Performed:
Monday-Friday (day shift) as needed

Methodology:
Electrophoresis

Remarks:
Refrigerate 24 hour collection container during collection

Collect:
24 hour urine collection container or urine cup

Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)

Sample Type:
24 hour urine collection or random urine

Preferred Volume:
10 mL urine

Minimum Volume:
6 mL urine

**Unacceptable Conditions:**
- Container not refrigerated during collection.

**Specimen Preparation:**
- Order PEU and TPUR for spot urines. Order PEU, TPU and AAUV for timed urines.

**Reference Interval:**
- Negative

**Synonyms:**
- PEP
- UPEP
- Albumin
- Paraprotein

**Stability (from collection to initiation):**
- Refrigerated 1 week

**Reported:**
- 1-3 days

**Additional Information:**
- A Total Protein is performed on the same sample and will be reported and billed separately. This test screens for Light Chains (Bence-Jones protein), the presence of which may indicate the need for immunofixation. The Laboratory Medicine resident will consult the ordering physician.

- An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**CPT Codes:**
- 84166

**LOINC Codes:**
- 13438-7
Protein S Activity
PSACT

ORDERING

Available Stat:
No
Performing Lab:
UC Davis
Methodology:
Clot detection
Reported:
Run once per week. Turnaround 6-10 days
Additional Information:
Test may be useful when there is a normal Free protein S level but persistent clinical suspicion for Hereditary Protein S deficiency.

A Free Protein S Antigen and a Protein S Activity should be ordered on the same specimen when a Protein S activity is requested. If only a Protein S Activity is requested, a Free Protein S Antigen will be performed.

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1.5 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Avoid hemolysis
For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 2 weeks

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed.

Rejection Criteria:
Received thawed.

PROCESSING

Test Code:
PSACT
Test Group:
Protein S
Sendout:
  Yes
Performing Lab:
  UC Davis
Specimen Preparation:
  This test is rarely necessary, most requests for Protein S should be ordered as PRSI unless 'activity' is explicitly included in the test request.

Deliver sample to Hematology ASAP for processing.

Separate and freeze plasma at -20C. Order Quest # 58891P
Preferred Volume:
  1.5 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected Hemolyzed.
Rejection Criteria:
  Received thawed.
Stability (from collection to initiation):
  Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 2 weeks

RESULT INTERPRETATION

Units:
  % activity
Reference Interval:
  Age
  Newborn - Day 4  12-60%
  Day 5 - 1 Month  22-78%
  1 Month - 3 Months 33-93%
  3 Months - 6 Months 54-118%
  >6 Months  70-119%
Additional Information:
  Test may be useful when there is a normal Free protein S level but persistent clinical suspicion for Hereditary Protein S deficiency.

A Free Protein S Antigen and a Protein S Activity should be ordered on the same specimen when a Protein S activity is requested. If only a Protein S Activity is requested, a Free Protein S Antigen will be performed.

ADMINISTRATIVE

CPT Codes:
  85306-90
LOINC Codes:
  27822-6

COMPLETE VIEW

Available Stat:
  No
Test Code:
  PSACT
Test Group:
  Protein S
Performing Lab:
  UC Davis
Sendout: Yes

Methodology:
Clot detection

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Avoid hemolysis

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1.5 mL plasma

Minimum Volume:
0.5 mL plasma

Rejection Criteria:
Received thawed.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Hemolyzed.

Specimen Preparation:
This test is rarely necessary, most requests for Protein S should be ordered as PRSI unless 'activity' is explicitly included in the test request.

Deliver sample to Hematology ASAP for processing.

Separate and freeze plasma at -20C. Order Quest # 58891P

Units:
% activity

Reference Interval:
Age
Newborn - Day 4 12-60%
Day 5 - 1 Month 22-78%
1 Month - 3 Months 33-93%
3 Months - 6 Months 54-118%
>6 Months 70-119%

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 2 weeks

Reported:
Run once per week. Turnaround 6-10 days

Additional Information:
Test may be useful when there is a normal Free protein S level but persistent clinical suspicion for Hereditary Protein S deficiency.

A Free Protein S Antigen and a Protein S Activity should be ordered on the same specimen when a Protein S activity is requested. If only a Protein S Activity is requested, a Free Protein S Antigen will be performed.

CPT Codes:
85306-90

LOINC Codes:
Protein S, free
PRSI

ORDERING

Available Stat: No
Performing Lab: Parnassus Hematology
Methodology: Immunoturbidimetric
Reported: 2-4 weeks
Additional Information:
A normal level does not exclude the possibility of an immunologically intact but dysfunctional protein.

A low level of free protein S may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, L-asparaginase therapy, pregnancy, oral contraceptives, estrogen therapy, states of acute inflammation, lupus anticoagulants, and proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- Free Protein S antigen

COLLECTION

Sample Type: Citrated plasma
Collect: Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL blood
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Draw only before institution of oral anticoagulant therapy or after a stable therapeutic regimen has been established.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code: PRSI
Test Group: Protein S
Performing Lab: Parnassus Hematology
Specimen Preparation:
This is the typical test that should be ordered when a request for Protein S is received unless it explicitly states 'Activity'. If 'activity' is specified order PSACT.

Deliver samples to Hematology asap for processing. Freeze plasma in 1 mL aliquots at -20C.

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
% activity

Reference Interval:
>6 mo 53-137%

There is no published pediatric reference range for Free Protein S antigen, which generally parallels the level of Total Protein S antigen, and from which the pediatric (< 6 months old) reference ranges given below are derived.

Full Term Infant
Day 1   Day 5   Day 30   Day 90   Day 180
12-60% 22-78% 33-93% 54-118% 55-119%


Healthy Premature Infant
Day 1   Day 5   Day 30   Day 90   Day 180
14-38% 13-61% 22-90% 40-112% 44-120%


Additional Information:
A normal level does not exclude the possibility of an immunologically intact but dysfunctional protein.

A low level of free protein S may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, L-asparaginase therapy, pregnancy, oral contraceptives, estrogen therapy, states of acute inflammation, lupus anticoagulants, and proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85306

LOINC Codes:
4677-1

COMPLETE VIEW

Available Stat:
No

Test Code:
PRSI
Test Group:
Protein S

Performing Lab:
Parnassus Hematology

Methodology:
Immunoturbidimetric

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Draw only before institution of oral anticoagulant therapy or after a stable therapeutic regimen has been established.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
This is the typical test that should be ordered when a request for Protein S is received unless it explicitly states ‘Activity’. If ‘activity’ is specified order PSACT.

Deliver samples to Hematology asap for processing. Freeze plasma in 1 mL aliquots at -20C.

Units:
% activity

Reference Interval:
>6 mo 53-137%

There is no published pediatric reference range for Free Protein S antigen, which generally parallels the level of Total Protein S antigen, and from which the pediatric (< 6 months old) reference ranges given below are derived.

Full Term Infant
Day 1  Day 5  Day 30  Day 90  Day 180
12-60%  22-78%  33-93%  54-118%  55-119%


Healthy Premature Infant
Day 1  Day 5  Day 30  Day 90  Day 180
14-38%  13-61%  22-90%  40-112%  44-120%


Synonyms:
• Free Protein S antigen

Reported:
2-4 weeks
Additional Information:

A normal level does not exclude the possibility of an immunologically intact but dysfunctional protein.

A low level of free protein S may be associated with an inherited deficiency or with secondary causes such as warfarin therapy, acute venous thrombosis, recent surgery, liver disease, vitamin K deficiency, disseminated intravascular coagulation, L-asparaginase therapy, pregnancy, oral contraceptives, estrogen therapy, states of acute inflammation, lupus anticoagulants, and proteinuria.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

CPT Codes:
85306

LOINC Codes:
4677-1
Protein, random urine
TPCUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (pyrogallol red)
Reported:
4-14 hours
Additional Information:
A creatinine is performed on the same sample to calculate the protein/creatinine ratio and will be reported and billed.

According to the KDIGO Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease, the normal protein/creatinine ratio in adults is < 150 mg protein/gram creatinine. According to UpToDate, a normal value for children greater than two years of age may be < 200 mg protein/gram creatinine and in infants and toddlers from 6 to 24 months of age, < 500 mg protein/gram creatinine. However, other references indicate that results can vary greatly according to sex and body size and that a single cutoff may not be appropriate for pediatric age groups (Mori Y et al., Pediatr Nephrol 2006; 21: 683-687).

Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

Comparison of measured urine protein reading to dipstick 'scale' reading:
Scale Approx. Concentration
Neg Neg
Trace <30 mg/dL
1+ 30 mg/dL
2+ 100 mg/dL
3+ 300 mg/dL
4+ >= 2000 mg/dL

Synonyms:
• TP
• Albumin

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
2 mL urine
Minimum Volume:
1 mL urine
Stability (from collection to initiation):
Refrigerated 2 days
**PROCESSING**

Test Code:
TPCUR

Test Group:
Total protein

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Specimen Preparation:
Order both TPCUR and CRUR on the sample.

Preferred Volume:
2 mL urine

Minimum Volume:
1 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

**RESULT INTERPRETATION**

Units:
mg/g creatinine

Reference Interval:
<150 mg/g creatinine

Additional Information:
A creatinine is performed on the same sample to calculate the protein/creatinine ratio and will be reported and billed.

According to the KDIGO Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease, the normal protein/creatinine ratio in adults is < 150 mg protein/gram creatinine. According to UpToDate, a normal value for children greater than two years of age may be < 200 mg protein/gram creatinine and in infants and toddlers from 6 to 24 months of age, < 500 mg protein/gram creatinine. However, other references indicate that results can vary greatly according to sex and body size and that a single cutoff may not be appropriate for pediatric age groups (Mori Y et al., Pediatr Nephrol 2006; 21: 683-687).

Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

Comparison of measured urine protein reading to dipstick 'scale' reading:

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</tr>
<tr>
<td>4+</td>
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</tr>
</tbody>
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**ADMINISTRATIVE**

CPT Codes:
84156

LOINC Codes:
2888-6

**COMPLETE VIEW**

Available Stat:
No
Test Code:
  TPCUR
Test Group:
  Total protein
Performing Lab:
  Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Spectrophotometric (pyrogallol red)
Collect:
  Urine cup
Amount to Collect:
  20 mL urine
Sample Type:
  Random urine
Preferred Volume:
  2 mL urine
Minimum Volume:
  1 mL urine
Specimen Preparation:
  Order both TPCUR and CRUR on the sample.
Units:
  mg/g creatinine
Reference Interval:
  <150 mg/g creatinine
Synonyms:
  • TP
  • Albumin
Stability (from collection to initiation):
  Refrigerated 2 days
Reported:
  4-14 hours
Additional Information:
  A creatinine is performed on the same sample to calculate the protein/creatinine ratio and will be reported and billed.

According to the KDIGO Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease, the normal protein/creatinine ratio in adults is < 150 mg protein/gram creatinine. According to UpToDate, a normal value for children greater than two years of age may be < 200 mg protein/gram creatinine and in infants and toddlers from 6 to 24 months of age, < 500 mg protein/gram creatinine. However, other references indicate that results can vary greatly according to sex and body size and that a single cutoff may not be appropriate for pediatric age groups (Mori Y et al., Pediatr Nephrol 2006; 21: 683-687).

Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

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<td>&gt;= 2000 mg/dL</td>
</tr>
</tbody>
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CPT Codes:
  84156
LOINC Codes:
2888-6
Protein, Total, 24 hour (or timed) urine
TPU

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.
Methodology:
Spectrophotometric (pyrogallol red)
Reported:
4-14 hours
Additional Information:
Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Synonyms:
- TP
- Albumin

COLLECTION

Sample Type:
Timed urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire urine output for collection period
Remarks:
Refrigerate the container during the period of the collection.
Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
TPU
Test Group:
Total protein
Performing Lab:
Parnassus & Mission Bay Chemistry
Stability (from collection to initiation):
Refrigerated 2 days
RESULT INTERPRETATION

Units:
  mg/D

Reference Interval:
  <160 mg/D

Additional Information:
  Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
  84156

COMPLETE VIEW

Available Stat:
  No

Test Code:
  TPU

Test Group:
  Total protein

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
  Spectrophotometric (pyrogallol red)

Remarks:
  Refrigerate the container during the period of the collection.

  Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

  Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
  24 hour urine collection container

Amount to Collect:
  Entire urine output for collection period

Sample Type:
  Timed urine collection

Units:
  mg/D

Reference Interval:
  <160 mg/D

Synonyms:
  - TP
  - Albumin

Stability (from collection to initiation):
Refrigerated 2 days

Reported:

4-14 hours

Additional Information:

Total urine protein is determined by the pyrogallol red method using a human albumin standard. This method is effective in detecting albumin and non-albumin proteins, including immunoglobulins. 24 hour urine protein excretion may be increased in a variety of conditions including renal disease, Bence Jones proteinuria, amyloidosis, hemorrhage, systemic infections, heart failure, dehydration, starvation, strenuous exercise, pregnancy, sickle cell disease, exposure to extreme cold and psychological stress.

Results of collections of less than 24 hour duration will be adjusted to reflect a ‘24 hour collection’. The limited time of collection as well as the need to adjust the values to be comparable to the ‘24 hour’ normal ranges will inherently affect the accuracy of the results.

CPT Codes:

84156
Protein, Total, Body Fluid
TPBF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (biuret)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Synonyms:
- TP
- Specific gravity, body fluid

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

PROCESSING

Test Code:
TPBF

Test Group:
Total protein

Performing Lab:
Parnassus & Mission Bay Chemistry

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
g/dL

Reference Interval:
Transudate: < 2.0 g/dL

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

ADMINISTRATIVE

CPT Codes:
84157

LOINC Codes:
2881-1

COMPLETE VIEW

Available Stat:
Yes

Ordering Recommendations:
Not a routinely available test. See ‘Additional information’

Test Code:
TPBF

Test Group:
Total protein

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (biuret)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body Fluid

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.2 mL fluid
Units:
g/dL

Reference Interval:
Transudate: < 2.0 g/dL

Synonyms:
- TP
- Specific gravity, body fluid

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:
- 84157

LOINC Codes:
- 2881-1
Protein, Total, CSF
TPCF

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (pyrogallol red)
Reported:
STAT 1 hour, Routine 4 hours
Synonyms:
• TP

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.35 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Stability (from collection to initiation):
Refrigerated 10 days.

PROCESSING

Test Code:
TPCF
Test Group:
Total protein
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.35 mL CSF
Stability (from collection to initiation):
Refrigerated 10 days.

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
15-50 mg/dL

ADMINISTRATIVE

CPT Codes:
84157
LOINC Codes:
2880-3

COMPLETE VIEW

Available Stat:
Yes
Test Code:
TPCF
Test Group:
Total protein
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (pyrogallol red)
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Sample Type:
CSF
Preferred Volume:
0.5 mL CSF
Minimum Volume:
0.35 mL CSF
Units:
mg/dL
Reference Interval:
15-50 mg/dL
Synonyms:
• TP
Stability (from collection to initiation):
Refrigerated 10 days.
Reported:
STAT 1 hour, Routine 4 hours
CPT Codes:
84157
LOINC Codes:
2880-3
Protein, Total, Plasma / Serum
TP

ORDERING

Available Stat:  
No
Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:  
Test available 24 hours per day 7 days per week
Methodology:  
Spectrophotometric (biuret)
Reported:  
4 hours
Additional Information:  
Lipemia may artifactually decrease the result.
Synonyms:  
- TP

COLLECTION

Sample Type:  
Plasma or serum
Collect:  
Light green top preferred, Gold top acceptable
Amount to Collect:  
1 mL blood
Preferred Volume:  
0.5 mL plasma or serum
Minimum Volume:  
0.2 mL plasma or serum
Stability (from collection to initiation):  
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:  
TP
Test Group:  
Total protein
Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:  
0.5 mL plasma or serum
Minimum Volume:  
0.2 mL plasma or serum
Stability (from collection to initiation):  
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
g/dL

Reference Interval:

- <1 year: 4.3 - 7.2 g/dL
- 1 year - 2 years: 5.2 - 7.7 g/dL
- 3 years - 5 years: 5.6 - 8.0 g/dL
- 6 years - 9 years: 6.5 - 8.6 g/dL
- >= 10 years: 6.0 - 8.4 g/dL

Normal ranges for children less than 10 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345 with the upper limits of normal adjusted for plasma specimens.

Normal range for adults: low end of 6.0 determined by testing 271 normal male and female UCSF blood donors and referenced by Beckman as the low end of adult recumbent patients. High end of 8.4 based on the Beckman Synchron upper limit of normal adjusted for plasma specimens.

Adult range used for children 10-18 years old. Adult range comparable to Beckman's range for age group 10-19 years (Bulletin 9345).

Additional Information:
Lipemia may artifactually decrease the result.

ADMINISTRATIVE

CPT Codes:
84115

LOINC Codes:
2885-2

COMPLETE VIEW

Available Stat:
No

Test Code:
TP

Test Group:
Total protein

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (biuret)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
g/dL

Reference Interval:

- <1 year: 4.3 - 7.2 g/dL
- 1 year - 2 years: 5.2 - 7.7 g/dL
- 3 years - 5 years: 5.6 - 8.0 g/dL
6 years - 9 years  6.5 - 8.6 g/dL
>= 10 years    6.0 - 8.4 g/dL

Normal ranges for children less than 10 years old adopted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345 with the upper limits of normal adjusted for plasma specimens.

Normal range for adults: low end of 6.0 determined by testing 271 normal male and female UCSF blood donors and referenced by Beckman as the low end of adult recumbent patients. High end of 8.4 based on the Beckman Synchron upper limit of normal adjusted for plasma specimens.

Adult range used for children 10-18 years old. Adult range comparable to Beckman's range for age group 10-19 years (Bulletin 9345).

Synonyms:
- TP

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

Reported:
4 hours

Additional Information:
Lipemia may artifactually decrease the result.

CPT Codes:
84115

LOINC Codes:
2885-2
Prothrombin (20210) mutation
PTTR

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Molecular Diagnostics
Performed: Run once per week, or as needed, day shift only
Methodology: PCR and allele-specific probes
Reported: 7-10 days
Additional Information:
Mutation and Incidence
The Prothrombin 20210G>A mutation (NM_000506.4(F2):c.*97G>A) is located in the 3' untranslated region of this gene. It has an estimated prevalence of 2% in Caucasians and is rare among Asians or Africans.

Pathogenicity
The Prothrombin 20210G>A mutation results in increased levels of plasma prothrombin and a concurrent increased risk of thrombosis. The mutation alters the polyadenylation site of the gene and results in increased mRNA synthesis and a subsequent increase in protein expression.

Thrombosis Risk
Heterozygosity for the Prothrombin 20210G>A carries a 3-4 fold increased risk of venous thromboembolism (VTE). Women heterozygous for this mutation and taking oral contraceptive pills have an approximately 16-fold increased risk of VTE.

Homozygosity for F2 20210G>A is expected to significantly elevate the risk of thrombosis, however, its precise risk has not been determined.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

If a mutation is detected it is recommended that the patient seek genetic counseling.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Thrombosis risk mutations
- Prothrombin 20210A
- Hypercoagulability

COLLECTION

Sample Type: Whole blood
Collect: Lavender top preferred, Blue top and Yellow (ACD) tops acceptable
Amount to Collect: 3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)
Preferred Volume: 3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)
Minimum Volume: 1.5 mL blood
Remarks:
Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Unacceptable Conditions:**
- Inadequate sample. Samples collected in heparin.

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**PROCESSING**

**Test Code:**
- PTTR

**Test Group:**
- Thrombosis risk

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
- Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

**Preferred Volume:**
- 3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

**Minimum Volume:**
- 1.5 mL blood

**Unacceptable Conditions:**
- Inadequate sample. Samples collected in heparin.

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**RESULT INTERPRETATION**

**Reference Interval:**
- Negative

**Additional Information:**
- **Mutation and Incidence**
  The Prothrombin 20210G>A mutation (NM_000506.4(F2):c.*97G>A) is located in the 3’ untranslated region of this gene. It has an estimated prevalence of 2% in Caucasians and is rare among Asians or Africans.

- **Pathogenicity**
  The Prothrombin 20210G>A mutation results in increased levels of plasma prothrombin and a concurrent increased risk of thrombosis. The mutation alters the polyadenylation site of the gene and results in increased mRNA synthesis and a subsequent increase in protein expression.

- **Thrombosis Risk**
  Heterozygosity for the Prothrombin 20210G>A carries a 3-4 fold increased risk of venous thromboembolism (VTE). Women heterozygous for this mutation and taking oral contraceptive pills have an approximately 16-fold increased risk of VTE.

  Homozygosity for F2 20210G>A is expected to significantly elevate the risk of thrombosis, however, its precise risk has not been determined.

  An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

  If a mutation is detected it is recommended that the patient seek genetic counseling.

  This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

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**ADMINISTRATIVE**

**CPT Codes:**
- 81240

**LDT or Modified FDA:**
- Yes

**LOINC Codes:**
- 24477-2
Available Stat: No

Test Code: PTTR

Test Group: Thrombosis risk

Performing Lab: Medical Genomics - Molecular Diagnostics

Performed: Run once per week, or as needed, day shift only

Methodology: PCR and allele-specific probes

Remarks: Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect: Lavender top preferred, Blue top and Yellow (ACD) tops acceptable

Amount to Collect: 3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Sample Type: Whole blood

Preferred Volume: 3 mL blood (Note this volume is sufficient to perform all thrombosis risk factor mutations)

Minimum Volume: 1.5 mL blood

Unacceptable Conditions: Inadequate sample. Samples collected in heparin.

Specimen Preparation: Do not centrifuge the specimen. Store at room temperature. Refrigerated samples are acceptable.

Reference Interval: Negative

Synonyms:
- Thrombosis risk mutations
- Prothrombin 20210A
- Hypercoagulability

Reported: 7-10 days

Additional Information:

Mutation and Incidence
The Prothrombin 20210G>A mutation (NM_000506.4(F2):c.*97G>A) is located in the 3’ untranslated region of this gene. It has an estimated prevalence of 2% in Caucasians and is rare among Asians or Africans.

Pathogenicity
The Prothrombin 20210G>A mutation results in increased levels of plasma prothrombin and a concurrent increased risk of thrombosis. The mutation alters the polyadenylation site of the gene and results in increased mRNA synthesis and a subsequent increase in protein expression.

Thrombosis Risk
Heterozygosity for the Prothrombin 20210G>A carries a 3-4 fold increased risk of venous thromboembolism (VTE). Women heterozygous for this mutation and taking oral contraceptive pills have an approximately 16-fold increased risk of VTE.

Homozygosity for F2 20210G>A is expected to significantly elevate the risk of thrombosis, however, its precise risk has not been determined.

An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
If a mutation is detected it is recommended that the patient seek genetic counseling.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Codes:**
81240

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
24477-2
**Prothrombin fragment 1+2**

**PROF**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Enzyme Immunoassay

**Reported:**
- 2-10 days

**Additional Information:**
- When prothrombin is converted to thrombin the prothrombin fragment 1+2 is released from prothrombin. The test is useful to assess ongoing coagulation activation as may occur in thrombosis or DIC.

### COLLECTION

**Sample Type:**
- Citrated plasma

**Collect:**
- Blue top filled to full extent of vacuum

**Amount to Collect:**
- 2.7 mL blood

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Remarks:**
- 1. Check the expiration date on the label of the blue top vacutainer before drawing the patient. 2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle. 3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum. 4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

### PROCESSING

**Test Code:**
- PROF

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Deliver sample to Hematology ASAP for processing. Freeze plasma in 1 mL aliquots at -20C. Ship on dry ice Monday-Friday to Quest, test code 37674X. For B &T patients ship on dry ice to LabCorp.test code #500016.

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
RESULT INTERPRETATION

Units:
  pmol/L
Reference Interval:
  41-372 pmol/L
Additional Information:
  When prothrombin is converted to thrombin the prothrombin fragment 1+2 is released from prothrombin. The test is useful to assess ongoing coagulation activation as may occur in thrombosis or DIC.

ADMINISTRATIVE

CPT Codes:
  83520-90
LOINC Codes:
  27824-2

COMPLETE VIEW

Available Stat:
  No
Test Code:
  PROF
Performing Lab:
  Quest
Sendout:
  Yes
Methodology:
  Enzyme Immunoassay
Remarks:
  1. Check the expiration date on the label of the blue top vacutainer before drawing the patient. 2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle. 3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum. 4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
Collect:
  Blue top filled to full extent of vacuum
Amount to Collect:
  2.7 mL blood
Sample Type:
  Citrated plasma
Preferred Volume:
  1 mL plasma
Minimum Volume:
  0.5 mL plasma
Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Specimen Preparation:
  Deliver sample to Hematology ASAP for processing. Freeze plasma in 1 mL aliquots at -20C. Ship on dry ice Monday-Friday to Quest, test code 37674X. For B &T patients ship on dry ice to LabCorp.test code #500016.
Units:
  pmol/L
Reference Interval:
  41-372 pmol/L
Reported:
2-10 days

Additional Information:
When prothrombin is converted to thrombin the prothrombin fragment 1+2 is released from prothrombin. The test is useful to assess ongoing coagulation activation as may occur in thrombosis or DIC.

CPT Codes:
83520-90

LOINC Codes:
27824-2
Prothrombin Time
PT

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Mechanical clot detection
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:

Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

The International Normalized Ratio (INR) will be routinely reported in addition to the Prothrombin Time in seconds. The reagents, and therefore the reference range in seconds, differ among the various UC affiliated hospitals. However, the INR adjusts for the inherent variability of tissue thromboplastins employed in the assay.

Note: when the prothrombin time is just above the upper limit of the normal range, calculation of the INR can result in a normal INR. This reflects the rounding of decimals utilized in the INR calculation.

The INR is the parameter of choice in monitoring the adequacy of warfarin anti-coagulation, and should in theory remain stable. The appropriate therapeutic range will vary with the disease and treatment intensity desired. The UCSF Hematology Consultation service generally recommends as therapeutic range for warfarin: (a) INR of 2.5-3.5 for most mechanical valves or recurrent systemic embolism, (b) INR of 2.0-3.0 for most other indications.

Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

The Prothrombin Time contains a reagent that neutralizes heparin up to 2 U/mL.

Per in-house study done 07/2018, the sensitivity of the PT for detecting factor deficiencies is as follows:

Factor PT prolongs when
Factor II < 35%
Factor V < 44%
Factor VII < 51%
Factor X < 57%

In regard to samples drawn through heparinized lines: (i) the PT reagent neutralizes low levels of heparin and (ii) additional heparin neutralization can cause a reduction in coagulation factor levels. For these reasons, heparin neutralization is not recommended for PT measurements.

Synonyms:
- PT
- coumadin
- warfarin
- INR
- Monitoring anticoagulation
**COLLECTION**

**Sample Type:**
- Citrated plasma

**Collect:**
- Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

**Amount to Collect:**
- Blue top: 2.7 mL blood
- Lt. Blue top: 1.8 mL blood

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Stability (from collection to initiation):**
- Unopened, uncentrifuged specimens are stable for 24 hours at room temperature.

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer.
- Over-filled or under-filled samples may be rejected.

**PROCESSING**

**Test Code:**
- PT

**Test Group:**
- Prothrombin time

**Performing Lab:**
- Parnassus, Mission Bay & Mt. Zion Hematology

**Preferred Volume:**
- 1.5 mL plasma

**Minimum Volume:**
- 1 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer.
- Over-filled or under-filled samples may be rejected.

**Stability (from collection to initiation):**
- Unopened, uncentrifuged specimens are stable for 24 hours at room temperature.

**RESULT INTERPRETATION**

**Units:**
- seconds

**Reference Interval:**

- PT: 11.8 - 14.8 seconds
- INR: 0.9 - 1.2
The PT of full-term normal infants does not appear to differ significantly from adults, although factor levels are somewhat lower in the first six months of life (Andrew, M et al. Development of the human coagulation system in the full-term infant. Blood. 70:165-172).

Critical Values:
INR >= 5.0

Additional Information:

Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

The International Normalized Ratio (INR) will be routinely reported in addition to the Prothrombin Time in seconds. The reagents, and therefore the reference range in seconds, differ among the various UC affiliated hospitals. However, the INR adjusts for the inherent variability of tissue thromboplastins employed in the assay.

Note: when the prothrombin time is just above the upper limit of the normal range, calculation of the INR can result in a normal INR. This reflects the rounding of decimals utilized in the INR calculation.

The INR is the parameter of choice in monitoring the adequacy of warfarin anti-coagulation, and should in theory remain stable. The appropriate therapeutic range will vary with the disease and treatment intensity desired. The UCSF Hematology Consultation service generally recommends as therapeutic range for warfarin: (a) INR of 2.5-3.5 for most mechanical valves or recurrent systemic embolism, (b) INR of 2.0-3.0 for most other indications.

Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

The Prothrombin Time contains a reagent that neutralizes heparin up to 2 U/mL.

Per in-house study done 07/2018, the sensitivity of the PT for detecting factor deficiencies is as follows:

Factor PT prolongs when
Factor II < 35%
Factor V < 44%
Factor VII < 51%
Factor X < 57%

In regard to samples drawn through heparinized lines: (i) the PT reagent neutralizes low levels of heparin and (ii) additional heparin neutralization can cause a reduction in coagulation factor levels. For these reasons, heparin neutralization is not recommended for PT measurements.
Test available 24 hours per day 7 days per week

**Methodology:**
Mechanical clot detection

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

**Collect:**
Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

**Amount to Collect:**
- Blue top: 2.7 mL blood
- Lt. Blue top: 1.8 mL blood

**Sample Type:**
Citrated plasma

**Preferred Volume:**
1.5 mL plasma

**Minimum Volume:**
1 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer.
- Over-filled or under-filled samples may be rejected.

**Units:**
seconds

**Reference Interval:**

PT: 11.8 - 14.8 seconds  
INR: 0.9 - 1.2

The PT of full-term normal infants does not appear to differ significantly from adults, although factor levels are somewhat lower in the first six months of life (Andrew, M et al. Development of the human coagulation system in the full-term infant. Blood. 70:165-172).

**Critical Values:**
INR >= 5.0

**Synonyms:**
- PT
- coumadin
- warfarin
- INR
- Monitoring anticoagulation

**Stability (from collection to initiation):**
Unopened, uncentrifuged specimens are stable for 24 hours at room temperature.

**Reported:**
STAT 1 hour, Routine 4 hours

**Additional Information:**
Current reagents permit the reporting of results up to 100 seconds; if no clot is detected by that time the result will be reported as > 100 seconds.

The International Normalized Ratio (INR) will be routinely reported in addition to the Prothrombin Time in seconds. The reagents, and therefore the reference range in seconds, differ among the various UC affiliated hospitals. However, the INR adjusts for the inherent variability of tissue thromboplastins employed in the assay.
Note: when the prothrombin time is just above the upper limit of the normal range, calculation of the INR can result in a normal INR. This reflects the rounding of decimals utilized in the INR calculation.

The INR is the parameter of choice in monitoring the adequacy of warfarin anti-coagulation, and should in theory remain stable. The appropriate therapeutic range will vary with the disease and treatment intensity desired. The UCSF Hematology Consultation service generally recommends as therapeutic range for warfarin: (a) INR of 2.5-3.5 for most mechanical valves or recurrent systemic embolism, (b) INR of 2.0-3.0 for most other indications.

Direct oral anticoagulant medications (non-vitamin K) should not be monitored with PT/INR or aPTT because the effect of these tests is not predictable. Recommendations for monitoring anticoagulant medications are available through the UCSF Hematology consultation services: for adults, pager 443-4276, for pediatrics pager 443-6966.

The Prothrombin Time contains a reagent that neutralizes heparin up to 2 U/mL.

Per in-house study done 07/2018, the sensitivity of the PT for detecting factor deficiencies is as follows:

- Factor II < 35%
- Factor V < 44%
- Factor VII < 51%
- Factor X < 57%

In regard to samples drawn through heparinized lines: (i) the PT reagent neutralizes low levels of heparin and (ii) additional heparin neutralization can cause a reduction in coagulation factor levels. For these reasons, heparin neutralization is not recommended for PT measurements.

CPT Codes:
- 85610

LOINC Codes:
- 5902-2
PRU Test P2Y12 Reaction
CLOP

ORDERING

Approval Required:
No, but must contact Hematology at x3-1747 to receive collection kit. For Neurointerventional radiology only.

Performing Lab:
Hematology, Parnassus

Performed:
Monday - Friday 0800 - 1600
Saturday - Sunday 0800 - 1545

Reported:
4 hours

Additional Information:
The VerifyNow PRUTest is designed to measure platelet P2Y12 receptor blockade.

Patients with inherited platelet disorders such as von Willebrand Factor Deficiency, Glanzmann Thrombasthenia and Bernard-Soulier Syndrome have not been studied with the VerifyNow PRUTest. The VerifyNow PRUTest is not intended for use with these types of platelet disorders.

Patients who have been treated with Glycoprotein IIb/IIIa inhibitor drugs should not be tested until platelet function has recovered. This time period is approximately 14 days after discontinuation of drug administration for abciximab (ReoPro) and up to 48 hours for eptifibatide (Integrilin) and tirofiban (Aggrastat). The platelet function recovery time varies among individuals and is longer for patients with renal dysfunction.

Test performance was not affected by hematocrit values between 33-52%, or platelet count values between 119,000 - 502,000/µL. Based on an in-house study performed on 3/29/16, correlation showed that as hematocrit increased, PRU results decreased.

Synonyms:
- P2Y12, Plavix Reaction

COLLECTION

Sample Type:
Citrated and EDTA anticoagulated whole blood

Collect:
1. Greiner partial fill discard
2. Greiner partial fill 3.2% Sodium citrate blue top
3. Lavender EDTA tube

Amount to Collect:
8 mL

Preferred Volume:
8 mL

Minimum Volume:
6 mL

Remarks:
Contact Hematology at x3-1747 for collection kits. DO NOT collect any specimens before 0800 or after 1600 from Monday to Friday; before 0800 or after 1545 on Saturday and Sunday.

1. Whole blood samples must be collected in or immediately transferred to Greiner 2.0 mL partial fill blue top tubes containing 3.2% Sodium Citrate. The tube must be filled to its intended whole blood capacity (indicated by small black line).
2. Whole blood may be collected from venous sites using a 21 gauge or larger needle in an appropriate blood collection tube.
3. Blood samples should be obtained from an extremity free of peripheral venous infusions.
4. Collect a discard tube first (approximately 2 mL), Greiner partial fill blue tops 2nd, and a lavender for CBC last.
5. Gently invert the sample tube at least 5 times to ensure complete mixing of the contents.
6. Blood must set a minimum of 10 minutes after collection before testing but no longer than 4 hours.

Samples cannot be pneumatic tubed.
Stability (from collection to initiation):
4 hours

Unacceptable Conditions:
- Clotted samples or if stability period exceeded.
- Incorrect tube type and/or no discard tube received.
- Patients with Hct's < 33% and/or Plt's < 119 x 109/L

PROCESSING

Test Code:
CLOP

Performing Lab:
Hematology, Parnassus

Specimen Preparation:
Deliver immediately to Hematology

Additional Processing Instructions:
A PRU will be ordered in computer. If no CBC or CBCD is requested, Central Processing will order a hematocrit (HCT) and platelet count (PLT).

Preferred Volume:
8 mL

Minimum Volume:
6 mL

Unacceptable Conditions:
- Clotted samples or if stability period exceeded.
- Incorrect tube type and/or no discard tube received.
- Patients with Hct's < 33% and/or Plt's < 119 x 109/L

Stability (from collection to initiation):
4 hours

RESULT INTERPRETATION

Units:
PRU

Reference Interval:
182-335

Additional Information:
The VerifyNow PRU Test is designed to measure platelet P2Y12 receptor blockade.

Patients with inherited platelet disorders such as von Willebrand Factor Deficiency, Glanzmann Thrombasthenia and Bernard-Soulier Syndrome have not been studied with the VerifyNow PRU Test. The VerifyNow PRU Test is not intended for use with these types of platelet disorders.

Patients who have been treated with Glycoprotein IIb/IIIa inhibitor drugs should not be tested until platelet function has recovered. This time period is approximately 14 days after discontinuation of drug administration for abciximab (ReoPro) and up to 48 hours for eptifibatide (Integrilin) and tirofiban (Aggrastat). The platelet function recovery time varies among individuals and is longer for patients with renal dysfunction.

Test performance was not affected by hematocrit values between 33-52%, or platelet count values between 119,000 - 502,000/µL. Based on an in-house study performed on 3/29/16, correlation showed that as hematocrit increased, PRU results decreased.

ADMINISTRATIVE

CPT Codes:
85576
LOINC Codes:
49010-2

COMPLETE VIEW

Approval Required:
No, but must contact Hematology at x3-1747 to receive collection kit. For Neurointerventional radiology only.

Test Code:
CLOP

Performing Lab:
Hematology, Parnassus

Performed:
Monday - Friday 0800 - 1600
Saturday - Sunday 0800 - 1545

Remarks:
Contact Hematology at x3-1747 for collection kits. DO NOT collect any specimens before 0800 or after 1600 from Monday to Friday; before 0800 or after 1545 on Saturday and Sunday.

1. Whole blood samples must be collected in or immediately transferred to Greiner 2.0 mL partial fill blue top tubes containing 3.2% Sodium Citrate. The tube must be filled to its intended whole blood capacity (indicated by small black line).
2. Whole blood may be collected from venous sites using a 21 gauge or larger needle in an appropriate blood collection tube.
3. Blood samples should be obtained from an extremity free of peripheral venous infusions.
4. Collect a discard tube first (approximately 2 mL), Greiner partial fill blue tops 2nd, and a lavender for CBC last.
5. Gently invert the sample tube at least 5 times to ensure complete mixing of the contents.
6. Blood must set a minimum of 10 minutes after collection before testing but no longer than 4 hours.

Samples cannot be pneumatic tubed.

Collect:
1. Greiner partial fill discard
2. Greiner partial fill 3.2% Sodium citrate blue top
3. Lavender EDTA tube

Amount to Collect:
8 mL

Sample Type:
Citrated and EDTA anticoagulated whole blood

Preferred Volume:
8 mL

Minimum Volume:
6 mL

Unacceptable Conditions:
Clotted samples or if stability period exceeded.
Incorrect tube type and/or no discard tube received.
Patients with Hct's < 33% and/or Plt's < 119 x 109/L

Specimen Preparation:
Deliver immediately to Hematology

Additional Processing Instructions:
A PRU will be ordered in computer. If no CBC or CBCD is requested, Central Processing will order a hematocrit (HCT) and platelet count (PLT).

Units:
PRU

Reference Interval:
182-335

Synonyms:
• P2Y12, Plavix Reaction

Stability (from collection to initiation):
4 hours
Reported:
4 hours

Additional Information:
The VerifyNow PRU Test is designed to measure platelet P2Y12 receptor blockade.

Patients with inherited platelet disorders such as von Willebrand Factor Deficiency, Glanzmann Thrombasthenia and Bernard-Soulier Syndrome have not been studied with the VerifyNow PRU Test. The VerifyNow PRU Test is not intended for use with these types of platelet disorders.

Patients who have been treated with Glycoprotein IIb/IIa inhibitor drugs should not be tested until platelet function has recovered. This time period is approximately 14 days after discontinuation of drug administration for abciximab (ReoPro) and up to 48 hours for eptifibatide (Integrilin) and tirofiban (Aggrastat). The platelet function recovery time varies among individuals and is longer for patients with renal dysfunction.

Test performance was not affected by hematocrit values between 33-52%, or platelet count values between 119,000 - 502,000/µL. Based on an in-house study performed on 3/29/16, correlation showed that as hematocrit increased, PRU results decreased.

CPT Codes:
85576

LOINC Codes:
49010-2
Pteridine Profile
MOLT

ORDERING

Available Stat: No
Performing Lab: Los Angeles Children's Hospital
Reported: Test performed Monday-Friday. Turnaround time: 3-4 days

Additional Information:
The profile includes Biopterin, Neopterin, %Biopterin and Dihyropteridine Reductase (DHPR) levels. Biopterin metabolites are assayed to determine whether hyperphenylalaninemia is due to classical PKU or faulty biopterin metabolism.

Transfusions can falsely raise the level of dihyropteridine reductase (DHPR) activity for up to 90 days.

Reduced pteridines are unstable to light and heat; the urine collection must be protected from both during and after collection.

Handling and shipping charges are charged to the Neonatal Screening Program budget number for all specimens submitted as part of a recall followup of that program. Specimens not submitted as a recall followup must be billed to the patient or insurance.

Synonyms:
- Biopterin
- Neopterin
- Dihyropteridine Reductase
- DHPR
- hyperphenylalaninemia
- PKU

COLLECTION

Sample Type: Random urine AND blood spots
Collect: Urine cup without preservatives (on ice)
Amount to Collect: 10 mL blood
Preferred Volume: 10 mL urine AND 4 completely filled blood spots on filter paper
Minimum Volume: 5 mL urine AND 4 completely filled blood spots on filter paper
Remarks:
Specimens for this assay should be obtained when PKU is first suspected and before dietary restrictions are instituted.

Do NOT collect urine within 24 hours of a patient having been given a contrast agent for a radiologic study; contrast agents yield unreliable analytical results.

Shield samples from light during and after collection by wrapping the collection container in aluminum foil. Place aluminum foil over the collection bag for bagged patients. Promptly place urine specimens on ice after collection.

Filter paper circles should be completely filled with blood, soaking through from one side to the other. DO NOT TOUCH ANY OF THE FILTER PAPER CIRCLES BEFORE OR AFTER COLLECTION. Dry the blood spots at room temperature for 2-4 hours while the paper is in a horizontal position. Cover the blood spots with the end flap of the collection device only after the specimen is completely dry.

Unacceptable Conditions:
Samples not refrigerated or protected from light during collection and transport.
**PROCESSING**

**Test Code:**
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

**Sendout:**
Yes

**Performing Lab:**
Los Angeles Children's Hospital

**Specimen Preparation:**

In DIM LIGHT, aliquot 10 mL of urine into a polypropylene tube. Wrap the tube in Aluminum foil to protect it from light and immediately freeze the tube at -20C.

Seal the dried blood spots in a plastic bag or tube and refrigerate them at 4C.

Complete all items on the special laboratory request form, order a "Pteridine Profile", and include the names, addresses, telephone numbers and fax numbers of anyone who should be notified of the results. Label the shipping container in large print "FREEZE PROMPTLY WHEN RECEIVED".

Ship the foil-covered urine container and the sealed container holding the dried blood spots together on dry ice.

To avoid weekend delivery, ship by overnight Federal Express on Monday-Wednesday only to: Children's Hospital Los Angeles, Department of Pathology and Laboratory Medicine, Special Chemistry Laboratory, Duque Bldg., 2nd Floor, Attn.: Won G. Ng, Ph.D, 4650 Sunset Blvd., Los Angeles, CA 90027, ph: (323) 669-2590, Fax: (323) 668-1047

**Preferred Volume:**
10 mL urine AND 4 completely filled blood spots on filter paper

**Minimum Volume:**
5 mL urine AND 4 completely filled blood spots on filter paper

**Unacceptable Conditions:**
Samples not refrigerated or protected from light during collection and transport.

**RESULT INTERPRETATION**

**Units:**
mmol/mol creat

**Reference Interval:**

Normals:

<table>
<thead>
<tr>
<th>Age</th>
<th>Biopterin mmol/mol creat</th>
<th>Neopterin mmol/mol creat</th>
<th>%Biopterin mmol/mol creat</th>
<th>Norms:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2 months</td>
<td>0.46-1.17</td>
<td>1.02-4.46</td>
<td>20-41</td>
<td></td>
</tr>
<tr>
<td>4 months -13 years</td>
<td>0.78-2.68</td>
<td>0.40-1.33</td>
<td>49-74</td>
<td></td>
</tr>
</tbody>
</table>

Dihydropteridine Reductase activity (nmol/min/spot) 1.96-7.51

Phenylketonuria:

<table>
<thead>
<tr>
<th>Age</th>
<th>Biopterin mmol/mol creat</th>
<th>Neopterin mmol/mol creat</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0-4 months</td>
<td>2.03-10.3</td>
<td>2.06-15.5</td>
<td>19-65</td>
<td></td>
</tr>
<tr>
<td>8 months -18 years</td>
<td>0.85-4.23</td>
<td>0.31-1.59</td>
<td>60-83</td>
<td></td>
</tr>
</tbody>
</table>


**Additional Information:**

The profile includes Biopterin, Neopterin, %Biopterin and Dihyropteridine Reductase (DHPR) levels. Biopterin metabolites are assayed to determine whether hyperphenylalaninemia is due to classical PKU or faulty biopterin metabolism.

Transfusions can falsely raise the level of dihydropteridine reductase (DHPR) activity for up to 90 days.

Reduced pteridines are unstable to light and heat; the urine collection must be protected from both during and after collection.

Handling and shipping charges are charged to the Neonatal Screening Program budget number for all specimens submitted as part of a
recall followup of that program. Specimens not submitted as a recall followup must be billed to the patient or insurance.

**ADMINISTRATIVE**

**CPT Codes:**
82491-90, 82657-90

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

**Performing Lab:**
Los Angeles Children's Hospital

**Sendout:**
Yes

**Remarks:**
Specimens for this assay should be obtained when PKU is first suspected and before dietary restrictions are instituted.

Do NOT collect urine within 24 hours of a patient having been given a contrast agent for a radiologic study; contrast agents yield unreliable analytical results.

Shield samples from light during and after collection by wrapping the collection container in aluminum foil. Place aluminum foil over the collection bag for bagged patients. Promptly place urine specimens on ice after collection.

Filter paper circles should be completely filled with blood, soaking through from one side to the other. DO NOT TOUCH ANY OF THE FILTER PAPER CIRCLES BEFORE OR AFTER COLLECTION. Dry the blood spots at room temperature for 2-4 hours while the paper is in a horizontal position. Cover the blood spots with the end flap of the collection device only after the specimen is completely dry.

**Collect:**
Urine cup without preservatives (on ice)

**Amount to Collect:**
10 mL blood

**Sample Type:**
Random urine AND blood spots

**Preferred Volume:**
10 mL urine AND 4 completely filled blood spots on filter paper

**Minimum Volume:**
5 mL urine AND 4 completely filled blood spots on filter paper

**Unacceptable Conditions:**
Samples not refrigerated or protected from light during collection and transport.

**Specimen Preparation:**
In DIM LIGHT, aliquot 10 mL of urine into a polypropylene tube. Wrap the tube in Aluminum foil to protect it from light and immediately freeze the tube at -20°C.

Seal the dried blood spots in a plastic bag or tube and refrigerate them at 4°C.

Complete all items on the special laboratory request form, order a "Pteridine Profile", and include the names, addresses, telephone numbers and fax numbers of anyone who should be notified of the results. Label the shipping container in large print "FREEZE PROMPTLY WHEN RECEIVED".

Ship the foil-covered urine container and the sealed container holding the dried blood spots together on dry ice.

To avoid weekend delivery, ship by overnight Federal Express on Monday-Wednesday only to: Children's Hospital Los Angeles, Department of Pathology and Laboratory Medicine, Special Chemistry Laboratory, Duque Bldg., 2nd Floor, Attn.: Won G. Ng, Ph.D, 4650 Sunset Blvd., Los Angeles, CA 90027, ph: (323) 669-2590, Fax: (323) 668-1047

**Units:**
mmol/mol creat

Test information subject to change.
Reference Interval:

Normals:

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<th>Age</th>
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Dihydropteridine Reductase activity (nmol/min/spot) 1.96-7.51

Phenylketonuria:

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<tr>
<td>8 months -18 years</td>
<td>0.85-4.23</td>
<td>0.31-1.59</td>
</tr>
</tbody>
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Synonyms:

- Biopterin
- Neopterin
- Dihyropteridine Reductase
- DHPR
- hyperphenylalaninemia
- PKU

Reported:

Test performed Monday-Friday. Turnaround time: 3-4 days

Additional Information:

The profile includes Biopterin, Neopterin, %Biopterin and Dihyropteridine Reductase (DHPR) levels. Biopterin metabolites are assayed to determine whether hyperphenylalaninemia is due to classical PKU or faulty biopterin metabolism.

Transfusions can falsely raise the level of dihyropteridine reductase (DHPR) activity for up to 90 days.

Reduced pteridines are unstable to light and heat; the urine collection must be protected from both during and after collection.

Handling and shipping charges are charged to the Neonatal Screening Program budget number for all specimens submitted as part of a recall followup of that program. Specimens not submitted as a recall followup must be billed to the patient or insurance

CPT Codes:

82491-90, 82657-90
Pyridoxine-Dependent Epilepsy Panel, Serum or Plasma
PDESP

ORDERING

Ordering Recommendations:
Primarily used for diagnosis and monitoring of patients with pyridoxine-dependent epilepsy. Can also aid in differential diagnosis of peroxisomal disorders, hyperlysinemia type 1, and sulfite oxidase/molybdenum cofactor deficiencies.

Performing Lab:
ARUP

Performing:
Fri

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
4-12 days

Synonyms:
- Alpha-aminoadipic semialdehyde, serum
- Delta1-piperideine-6-carboxylate, Serum
- Pipecolic Acid, Serum/Plasma

COLLECTION

Patient Preparation:
Adults: Fasting specimen preferred.
Infants and Children: Draw specimen prior to feeding or 2-3 hours after a meal preferred.

Sample Type:
Serum of plasma

Collect:
- Green (Sodium or Lithium Heparin), Lavender (EDTA), Plain Red, or Serum Separator Tube (SST).

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma/serum

Minimum Volume:
0.3 mL plasma/serum

Remarks:
Clinical information is needed for appropriate interpretation. Submit age, gender, diet (eg., TPN therapy), drug therapy, and family history on a Biochemical Genetics Patient History Form available at www.aruplab.com/patienthistory or by contacting ARUP Client Services at (800) 522-2787.

Stability (from collection to initiation):
- After separation from cells: Ambient: Unacceptable; Refrigerated: 24 hours; Frozen at -20°C: 1 week; Frozen at -70°C: 1 year

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Unacceptable Conditions:
Samples exposed to more than two freeze/thaw cycles.

PROCESSING

Test Code:
PDESP

ARUP Test Code:
2013352

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum or plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.2 mL)

Preferred Volume:
0.5 mL plasma/serum

Minimum Volume:
0.3 mL plasma/serum

Unacceptable Conditions:
Samples exposed to more than two freeze/thaw cycles.

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 24 hours; Frozen at -20°C: 1 week; Frozen at -70°C: 1 year

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

RESULT INTERPRETATION

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Pipecolic Acid</th>
<th>Total AASA-P6C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>Less than or equal to 5.2 umol/L</td>
<td>Less than or equal to 1.6 umol/L</td>
</tr>
<tr>
<td>Greater than 1 year</td>
<td>Less than or equal to 6.3 umol/L</td>
<td>Less than or equal to 3.1 umol/L</td>
</tr>
</tbody>
</table>

Interpretive Data:
Refer to report

ADMINISTRATIVE

CPT Codes:
82542

LOINC:
- 32334-5
- 48767-8

COMPLETE VIEW

Ordering Recommendations:
Primarily used for diagnosis and monitoring of patients with pyridoxine-dependent epilepsy. Can also aid in differential diagnosis of peroxisomal disorders, hyperlysinemia type 1, and sulfite oxidase/molybdenum cofactor deficiencies.

Test Code:
PDESP

ARUP Test Code:
2013352

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Fri

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Patient Preparation:
Adults: Fasting specimen preferred.
Infants and Children: Draw specimen prior to feeding or 2-3 hours after a meal preferred.

Remarks:
Clinical information is needed for appropriate interpretation. Submit age, gender, diet (eg., TPN therapy), drug therapy, and family history on a Biochemical Genetics Patient History Form available at www.aruplab.com/patienthistory or by contacting ARUP Client Services at (800) 522-2787.

Collect:
Green (Sodium or Lithium Heparin), Lavender (EDTA), Plain Red, or Serum Separator Tube (SST).

Amount to Collect:
1 mL blood

Sample Type:
Serum of plasma

Preferred Volume:
0.5 mL plasma/serum

Minimum Volume:
0.3 mL plasma/serum

Unacceptable Conditions:
Samples exposed to more than two freeze/thaw cycles.

Specimen Preparation:
Separate from cells ASAP or within 2 hours of collection. Transfer 0.5 mL serum or plasma to an ARUP Standard Transport Tube and freeze immediately. (Min: 0.2 mL)

Reference Interval:

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</table>

Interpretive Data:
Refer to report

Synonyms:
- Alpha-aminoadipic semialdehyde, serum
- Delta1-piperideine-6-carboxylate, Serum
- Pipecolic Acid, Serum/Plasma

Storage/Transport Temperature:
CRITICAL FROZEN. Separate specimens must be submitted when multiple tests are ordered.

Stability (from collection to initiation):
After separation from cells: Ambient: Unacceptable; Refrigerated: 24 hours; Frozen at -20°C: 1 week; Frozen at -70°C: 1 year

Reported:
4-12 days

CPT Codes:
82542

LOINC:
- 32334-5
- 48767-8
Pyruvate Kinase, RBC
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Spectrophotometry
Reported:
Test performed Monday-Saturday.
Synonyms:
- Pyruvate kinase, erythrocyte

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Do not centrifuge or freeze; refrigerate. Order MAYO# 8659
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood

RESULT INTERPRETATION

Units:
U/g of hemoglobin
Reference Interval:
6.7 - 14.3 U/g of hemoglobin

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
84220-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Spectrophotometry

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Specimen Preparation:
Do not centrifuge or freeze; refrigerate. Order MAYO# 8659

Units:
U/g of hemoglobin

Reference Interval:
6.7 - 14.3 U/g of hemoglobin

Synonyms:
Pyruvate kinase, erythrocyte

Reported:
Test performed Monday-Saturday.

CPT Codes:
84220-90
Pyruvate, CSF
PYRUC

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Enzymatic
Reported:
Set up Monday, Wednesday, Friday. Turn around time 3-5 days
Synonyms:
- Pyruvic acid

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
2 mL CSF
Preferred Volume:
2 mL CSF
Minimum Volume:
1 mL CSF
Remarks:
Deliver to Clinical Laboratories immediately after collection for testing.
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20°C 6 months.
Rejection Criteria:
Sample rec'd at room temperature.

PROCESSING

Test Code:
PYRUC
Test Group:
Pyruvate
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
If specimen is not clear or contains blood, centrifuge and separate supernatant fluid before freezing. Transfer fluid aseptically into a sterile plastic conical tube for transport. Freeze immediately, transport to China Basin sendout frozen.
Preferred Volume:
2 mL CSF
Minimum Volume:
1 mL CSF
Rejection Criteria:
Sample rec'd at room temperature.
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20C 6 months.

RESULT INTERPRETATION

Units:
mg/dL
Reference Interval:
0.50-1.70 mg/dL

ADMINISTRATIVE

CPT Codes:
84210-90

COMPLETE VIEW

Available Stat:
No
Test Code:
PYRUC
Test Group:
Pyruvate
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Enzymatic
Remarks:
Deliver to Clinical Laboratories immediately after collection for testing.
Collect:
CSF tube or sterile collection tube
Amount to Collect:
2 mL CSF
Sample Type:
CSF
Preferred Volume:
2 mL CSF
Minimum Volume:
1 mL CSF
Rejection Criteria:
Sample rec'd at room temperature.
Specimen Preparation:
If specimen is not clear or contains blood, centrifuge and separate supernatant fluid before freezing. Transfer fluid aseptically into a sterile plastic conical tube for transport. Freeze immediately, transport to China Basin sendout frozen.
Units:
mg/dL
Reference Interval:
0.50-1.70 mg/dL
Synonyms:
• Pyruvic acid
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20C 6 months.
Reported:
   Set up Monday, Wednesday, Friday. Turn around time 3-5 days
CPT Codes:
   84210-90
**Pyruvate, plasma**

**PYRU**

**ORDERING**

**Ordering Recommendations:**

PLEASE READ COLLECTION INSTRUCTIONS CAREFULLY BEFORE OBTAINING SAMPLES.

**Available Stat:**

No

**Performing Lab:**

Quest

**Performed:**

Daily, weekdays

**Methodology:**

Enzymatic

**Reported:**

1-4 days

**Additional Information:**

To convert mmol/L (SI units) to conventional mg/dL, multiply by 8.77.

**COLLECTION**

**Patient Preparation:**

An 8 hour fast before specimen collection is preferred.

**Sample Type:**

Plasma filtrate

**Collect:**

Lavender top (on ice)

**Amount to Collect:**

2 mL blood (be sure to fill vacutainer completely)

Note: If the patient cannot tolerate this volume contact the laboratory at x3-1667 and ask to speak to a Processing or Chemistry supervisor. The volume of blood that can be collected (minimum 1.0 mL) needs to be coordinated with the lab so we can create a special perchloric acid tube containing an equal volume of Perchloric acid for use in stabilizing the sample.

**Preferred Volume:**

2.5 mL plasma filtrate

**Minimum Volume:**

0.6 mL plasma filtrate

**Remarks:**

Note: If the patient cannot tolerate the 2 mL preferred volume, contact the laboratory at x3-1667 and ask to speak to a Processing or Chemistry supervisor. The volume of blood that can be collected (minimum 1.0 mL) needs to be coordinated with the lab so we can create a special perchloric acid tube containing an equal volume of Perchloric acid for use in stabilizing the sample.

Whole blood:

1. Collection kits containing a conical tube with 2 mL 7% Perchloric acid and 2 mL Lavender top (EDTA) vacutainers are available from the 5th Floor laboratory and the ACC phlebotomy area. Samples must be collected with this kit.

2. Place the tube containing 2 mL Perchloric acid in a cup of ice to chill

3. Draw 2 mL blood into a Lavender top (EDTA) vacutainer with minimum stasis (be sure the container fills completely) The second lavender top tube in the kit is for back-up purposes only.

4. Gently mix the EDTA sample by inversion 4-6 times

5. Carefully open the Perchloric acid tube (avoid skin contact with the Perchloric acid)
6. Using a gauze or safety wipe carefully remove the cap from the vacutainer to avoid creating droplets

7. Pour the entire contents of the vacutainer into the Perchloric acid tube

8. TIGHTLY cap the tube containing the blood/Perchloric acid mixture and mix vigorously by hand.

9. Attach a patient label to the conical tube containing the mixture

9. Place the tube back into the cup of ice and hand carry immediately to the lab for processing.

**Stability (from collection to initiation):**
- Refrigerated 1 month, frozen at -20C 3 months

**Rejection Criteria:**
- Sample not mixed with Perchloric acid within 30-60 seconds after collection. Not delivered on ice.

**PROCESSING**

**Test Code:**
- PYRU

**Test Group:**
- Pyruvate

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Provide sample to Chemistry staff immediately upon receipt.

Chemistry will centrifuge the chilled tube containing EDTA whole blood and 7% Perchloric acid for 10 minutes at 3000 rpm. Transfer the supernatant into a specimen vial and label with a Sunquest label. Record the approximate volume of the supernatant on the requisition. Freeze at -20C.

Store and ship the sample frozen. Order Quest # 765Z.

**Preferred Volume:**
- 2.5 mL plasma filtrate

**Minimum Volume:**
- 0.6 mL plasma filtrate

**Rejection Criteria:**
- Sample not mixed with Perchloric acid within 30-60 seconds after collection. Not delivered on ice.

**Stability (from collection to initiation):**
- Refrigerated 1 month, frozen at -20C 3 months

**RESULT INTERPRETATION**

**Units:**
- mg/dL

**Reference Interval:**
- 0.30 - 1.50 mg/dL

**Additional Information:**
- To convert mmol/L (SI units) to conventional mg/dL, multiply by 8.77.

**ADMINISTRATIVE**

**CPT Codes:**
- 84210-90

**LOINC Codes:**
- 14121-8
Available Stat:  No
Ordering Recommendations:
  PLEASE READ COLLECTION INSTRUCTIONS CAREFULLY BEFORE OBTAINING SAMPLES.
Test Code:
  PYRU
Test Group:
  Pyruvate
Performing Lab:
  Quest
Sendout:
  Yes
Performed:
  Daily, weekdays
Methodology:
  Enzymatic
Patient Preparation:
  An 8 hour fast before specimen collection is preferred.
Remarks:
  Note: If the patient cannot tolerate the 2 mL preferred volume, contact the laboratory at x3-1667 and ask to speak to a Processing or Chemistry supervisor. The volume of blood that can be collected (minimum 1.0 mL) needs to be coordinated with the lab so we can create a special perchloric acid tube containing an equal volume of Perchloric acid for use in stabilizing the sample.

Whole blood:
1. Collection kits containing a conical tube with 2 mL 7% Perchloric acid and 2 mL Lavender top (EDTA) vacutainers are available from the 5th Floor laboratory and the ACC phlebotomy area. Samples must be collected with this kit.

2. Place the tube containing 2 mL Perchloric acid in a cup of ice to chill

3. Draw 2 mL blood into a Lavender top (EDTA) vacutainer with minimum stasis (be sure the container fills completely) The second lavender top tube in the kit is for back-up purposes only.

4. Gently mix the EDTA sample by inversion 4-6 times

5. Carefully open the Perchloric acid tube (avoid skin contact with the Perchloric acid)

6. Using a gauze or safety wipe carefully remove the cap from the vacutainer to avoid creating droplets

7. Pour the entire contents of the vacutainer into the Perchloric acid tube

8. TIGHTLY cap the tube containing the blood/Perchloric acid mixture and mix vigorously by hand.

9. Attach a patient label to the conical tube containing the mixture

9. Place the tube back into the cup of ice and hand carry immediately to the lab for processing.

Collect:
  Lavender top (on ice)
Amount to Collect:
  2 mL blood (be sure to fill vacutainer completely)

Note: If the patient cannot tolerate this volume contact the laboratory at x3-1667 and ask to speak to a Processing or Chemistry supervisor. The volume of blood that can be collected (minimum 1.0 mL) needs to be coordinated with the lab so we can create a special perchloric acid tube containing an equal volume of Perchloric acid for use in stabilizing the sample.

Sample Type:
  Plasma filtrate
Preferred Volume:
2.5 mL plasma filtrate

**Minimum Volume:**

0.6 mL plasma filtrate

**Rejection Criteria:**

Sample not mixed with Perchloric acid within 30-60 seconds after collection. Not delivered on ice.

**Specimen Preparation:**

Provide sample to Chemistry staff immediately upon receipt.

Chemistry will centrifuge the chilled tube containing EDTA whole blood and 7% Perchloric acid for 10 minutes at 3000 rpm. Transfer the supernatant into a specimen vial and label with a Sunquest label. Record the approximate volume of the supernatant on the requisition. Freeze at -20°C.

Store and ship the sample frozen. Order Quest # 765Z.

**Units:**

mg/dL

**Reference Interval:**

0.30 - 1.50 mg/dL

**Stability (from collection to initiation):**

Refrigerated 1 month, frozen at -20°C 3 months

**Reported:**

1-4 days

**Additional Information:**

To convert mmol/L (SI units) to conventional mg/dL, multiply by 8.77.

**CPT Codes:**

84210-90

**LOINC Codes:**

14121-8
QuantiFeron-TB Gold Plus
QFTBP

ORDERING

Ordering Recommendations:
The QuantiFERON test detects the release of IFN-gamma released by whole blood lymphocytes after incubation with tuberculin purified protein derivative and phytohemagglutinin.

The test is intended for screening asymptomatic individuals who may be at risk for latent tuberculosis (recent immigrants, prisoners and prison/jail employees) or TB exposure (military, hospital personnel). In these settings it is equivalent but no better than skin testing.

QuantiFERON testing may be more specific than skin testing when screening individuals with a history of prior BCG vaccination.

It is NOT recommended for use in patients with symptoms of active TB (known to cause decreased IFN-G responses), contacts of patients with active TB, immunosuppressed patients, patients with diabetes, silicosis, chronic renal failure, leukemia, lymphoma, head/neck cancer, lung cancer, s/p gastrectomy or jejunoileal bypass. In these situations skin testing is recommended.

Available Stat:
No
Performing Lab:
Immunology
Performed:
Tuesday and Friday (day shift)
Methodology:
Enzyme Immunoassay
Reported:
5-7 days
Synonyms:
- Tuberculosis
- TB
- TB skin test
- Interferon gamma
- IFN gamma

COLLECTION

Sample Type:
Blood
Collect:
Requires special collection kit available from central laboratory containing:

| QFT-Nil Control tube | Gray cap, white ring |
| QFT-TB1 Antigen tube | Green cap, white ring |
| QFT-TB2 Antigen tube | Yellow cap, white ring |
| QFT-Mitogen Control tube | Purple cap, white ring |

Note: It is mandatory the tubes be filled correctly within the black line indicated on the tubes, underfilled or overfilled tubes will be rejected by lab.

Amount to Collect:
4 mL blood, place 1 mL of blood into each tube in the collection kit
Remarks:
A set of four QuantiFERON-TB Gold Plus tubes (Gray cap/white ring, Green cap/white ring, Yellow cap/white ring and Purple cap/white ring) must be collected at the same time, with 1mL of blood in each tube.
Note: It is mandatory the tubes be filled correctly as underfilled or overfilled tubes will be rejected by the lab.

INPATIENT:
COLLECT SAMPLE 4 AM - 6:30 PM ON MONDAY - FRIDAY ONLY. DO NOT COLLECT SAMPLE ON WEEKEND OR UCSF OBSERVED HOLIDAYS

OUTPATIENTS:
COLLECT BETWEEN 7 AM - 6:30 PM ON MONDAY - FRIDAY ONLY BY UCSF LABORATORY STAFF AT OUR OUTPATIENT FACILITIES. DO NOT COLLECT SAMPLE ON WEEKEND OR UCSF OBSERVED HOLIDAYS.

1. For Parnassus and Mission Bay inpatient only, pick up collection kits from Laboratory Central Processing.

2. Collect 1 ml of blood by venipuncture directly into each of the four tubes (Nil, TB1 Antigen, TB2 Antigen, Mitogen). Fill each tube up to the black mark indicated on the collection tube. Under or overfilling of the tubes may lead to erroneous results.

3. Mix the tubes by shaking firmly and vertically for 10 times and label tubes appropriately.

4. Please verify that all four collection tubes are collected with appropriate amount of blood (blood volume is within the black line indicated on the tube). Please do not stick label all around the tube, but allow sample level and black line visible to ease testing in the laboratory.

5. These are TIME SENSITIVE samples, please deliver the tubes to the Laboratory Central Processing immediately.

Stability (from collection to initiation):
Samples need to be incubated at China Basin as soon as possible after collection (within 16 hours of collection).

Storage/Transport Temperature:
Room Temperature

Unacceptable Conditions:
Frozen or refrigerated samples. Improperly collected samples. Overfilled or underfilled tubes received.

PROCESSING

Test Code:
QFTBP

Performing Lab:
Immunology

Specimen Preparation:
Accession the samples immediately upon receipt and send to Immunology Lab at China Basin at room temperature. Samples received after 6:30pm or 7pm, please send them with Microbiology Lab courier to China Basin Microbiology Lab. Please reject samples collected after 6:30pm that missed 8:30pm courier run.

Exception: Accept samples collected outside of "4am - 6:30pm Monday - Friday" from patients admitted for a kidney transplant at Parnassus only. The tubes will be delivered by kidney transplant unit staff to Central Processing Lab at Parnassus to accession. Send the samples to Microbiology Lab at China Basin for incubation and processing.

Please verify that all four collection tubes are collected with appropriate amount of blood (blood volume is within the black line indicated on the tube). Please do not stick label all around the tube, but allow sample level and black line visible to ease testing in the laboratory.

Unacceptable Conditions:
Frozen or refrigerated samples. Improperly collected samples. Overfilled or underfilled tubes received.

Stability (from collection to initiation):
Samples need to be incubated at China Basin as soon as possible after collection (within 16 hours of collection).

Storage/Transport Temperature:
Room Temperature

RESULT INTERPRETATION

Units:
IU/mL

Reference Interval:

Negative

Interpretive Data:

Results Interpretation:

<table>
<thead>
<tr>
<th>Nil = QNIL (IU/mL)</th>
<th>TB1 - Nil = QTB1 (IU/mL)</th>
<th>TB2-Nil = QTB2 (IU/mL)</th>
<th>Mitogen - Nil = QMIT (IU/mL)</th>
<th>QTF-Plus Result and Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 8.0</td>
<td>&lt;0.35 OR &gt;= 0.35 and &lt;25% of Nil value</td>
<td>&lt;0.35 OR &gt;= 0.35 and &lt;25% of Nil value</td>
<td>&gt;= 0.5</td>
<td>Negative M. tuberculosis infection NOT likely</td>
</tr>
<tr>
<td>&lt;= 8.0</td>
<td>&gt;= 0.35 AND &gt;= 25% of Nil value</td>
<td>Any</td>
<td>Any</td>
<td>Positive M. tuberculosis infection likely</td>
</tr>
<tr>
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</tbody>
</table>

A negative QuantiFERON-TB Gold Plus result does not preclude the possibility of Mycobacterium tuberculosis infection or tuberculosis disease. Falsely negative results can be due to the stage of infection, conditions that affect immune functions, improper blood sample collection or handling of the specimen.

A positive QuantiFERON-TB Gold Plus result indicates that a Mycobacterium tuberculosis infection is very likely. False-positive QuantiFERON-TB Gold Plus result may occur due to improper preanalytical processing of the QuantiFERON-TB Gold Plus tubes, prior infection with certain other mycobacteria or biologic variability. Positive results should be confirmed with other clinical, exposure, and laboratory findings.

Test is not interpretable with indeterminate result. An indeterminate QuantiFERON-TB Gold Plus result suggests possible preanalytic error or individual patient related factors.

ADMINISTRATIVE

CPT Codes:

86481

LOINC Codes:

71775-1 - QUANTIFERON®-TB GOLD PLUS Panel code
71776-9 - NIL
64084-7 - TB1-NIL
88517-8 - TB2-NIL
71774-4 - MITOGEN-NIL
71773-6 - QUANTIFERON®-TB GOLD PLUS Result

COMPLETE VIEW

Available Stat:

No

Ordering Recommendations:

The QuantiFERON test detects the release of IFN-gamma released by whole blood lymphocytes after incubation with tuberculin purified protein derivative and phytohemagglutinin.

The test is intended for screening asymptomatic individuals who may be at risk for latent tuberculosis (recent immigrants, prisoners and prison/jail employees) or TB exposure (military, hospital personnel). In these settings it is equivalent but no better than skin testing.

QuantiFERON testing may be more specific than skin testing when screening individuals with a history of prior BCG vaccination.
It is NOT recommended for use in patients with symptoms of active TB (known to cause decreased IFN-G responses), contacts of patients with active TB, immunosuppressed patients, patients with diabetes, silicosis, chronic renal failure, leukemia, lymphoma, head/neck cancer, lung cancer, s/p gastrectomy or jejunoileal bypass. In these situations skin testing is recommended.

Test Code:
QFTBP
Performing Lab:
Immunology
Performed:
Tuesday and Friday (day shift)
Methodology:
Enzyme Immunoassay
Remarks:
A set of four QuantiFERON-TB Gold Plus tubes (Gray cap/white ring, Green cap/white ring, Yellow cap/white ring and Purple cap/white ring) must be collected at the same time, with 1mL of blood in each tube.

Note: It is mandatory the tubes be filled correctly as underfilled or overfilled tubes will be rejected by the lab.

INPATIENT:
COLLECT SAMPLE 4 AM - 6:30 PM ON MONDAY - FRIDAY ONLY. DO NOT COLLECT SAMPLE ON WEEKEND OR UCSF OBSERVED HOLIDAYS

OUTPATIENTS:
COLLECT BETWEEN 7 AM - 6:30 PM ON MONDAY - FRIDAY ONLY BY UCSF LABORATORY STAFF AT OUR OUTPATIENT FACILITIES. DO NOT COLLECT SAMPLE ON WEEKEND OR UCSF OBSERVED HOLIDAYS.

1. For Parnassus and Mission Bay inpatient only, pick up collection kits from Laboratory Central Processing.
2. Collect 1 ml of blood by venipuncture directly into each of the four tubes (Nil, TB1 Antigen, TB2 Antigen, Mitogen). Fill each tube up to the black mark indicated on the collection tube. Under or overfilling of the tubes may lead to erroneous results.
3. Mix the tubes by shaking firmly and vertically for 10 times and label tubes appropriately.
4. Please verify that all four collection tubes are collected with appropriate amount of blood (blood volume is within the black line indicated on the tube). Please do not stick label all around the tube, but allow sample level and black line visible to ease testing in the laboratory.
5. These are TIME SENSITIVE samples, please deliver the tubes to the Laboratory Central Processing immediately.

Collect:
Requires special collection kit available from central laboratory containing:

<table>
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<tr>
<th>QFT-Nil Control tube</th>
<th>Gray cap, white ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>QFT-TB1 Antigen tube</td>
<td>Green cap, white ring</td>
</tr>
<tr>
<td>QFT-TB2 Antigen tube</td>
<td>Yellow cap, white ring</td>
</tr>
<tr>
<td>QFT-Mitogen Control tube</td>
<td>Purple cap, white ring</td>
</tr>
</tbody>
</table>

Note: It is mandatory the tubes be filled correctly within the black line indicated on the tubes, underfilled or overfilled tubes will be rejected by lab.

Amount to Collect:
4 mL blood, place 1 mL of blood into each tube in the collection kit

Sample Type:
Blood

Unacceptable Conditions:
Frozen or refrigerated samples. Improperly collected samples. Overfilled or underfilled tubes received.

Specimen Preparation:
Accession the samples immediately upon receipt and send to Immunology Lab at China Basin at room temperature. Samples received after 6:30pm or 7pm, please send them with Microbiology Lab courier to China Basin Microbiology Lab. Please reject samples collected
after 6:30pm that missed 8:30pm courier run.

Exception: Accept samples collected outside of “4am - 6:30pm Monday - Friday” from patients admitted for a kidney transplant at Parnassus only. The tubes will be delivered by kidney transplant unit staff to Central Processing Lab at Parnassus to accession. Send the samples to Microbiology Lab at China Basin for incubation and processing.

Please verify that all four collection tubes are collected with appropriate amount of blood (blood volume is within the black line indicated on the tube). Please do not stick label all around the tube, but allow sample level and black line visible to ease testing in the laboratory.

**Units:**
- IU/mL

**Reference Interval:**
- Negative

**Interpretive Data:**

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Test is not interpretable with indeterminate result. An indeterminate QuantiFERON-TB Gold Plus result suggests possible preanalytic error or individual patient related factors.

**Synonyms:**
- Tuberculosis
- TB
- TB skin test
- Interferon gamma
- IFN gamma

**Storage/Transport Temperature:**
- Room Temperature

**Stability (from collection to initiation):**
- Samples need to be incubated at China Basin as soon as possible after collection (within 16 hours of collection).

**Reported:**
- 5-7 days

**CPT Codes:**
86481

LOINC Codes:

- 71775-1 - QUANTIFERON®-TB GOLD PLUS Panel code
- 71776-9 - NIL
- 64084-7 - TB1-NIL
- 88517-8 - TB2-NIL
- 71774-4 - MITOGEN-NIL
- 71773-6 - QUANTIFERON®-TB GOLD PLUS Result
Quantitative Amino Acids, Plasma (to Stanford, see Utilization Guidelines)

AAQTS

ORDERING

Ordering Recommendations:
This test should only be ordered for new diagnostic workup of patients with suspected disorders of amino acid metabolism. It should not be used for previously diagnosed patients for monitoring amino acid levels in response to treatment. For monitoring order "Quantitative Amino Acids, Plasma" test code "AMACP".

Approval Required:
Yes, if not ordered by Genetics or neurology. If ordered in previously diagnosed patients (see Utilization Guidelines)

Available Stat:
No, however, in exceptional circumstances when there is a need for rapid testing, courier transport to Stanford can be arranged (see 'Processing notes')

Performing Lab:
Lucille-Packard Children's Hospital

Methodology:
Ion Exchange Chromatography

Reported:
Set up as needed, at least 2x a week. Turnaround time: One week.

Synonyms:
- Glycine
- Homocystine
- Tyrosine
- Alpha-keto acids
- Arginine
- Arginosuccinase deficiency
- Arginosuccinate Lyase deficiency
- Aspartate
- Aspartic acid
- Beta-aminoisobutyric acid
- Citrulline
- Cystathionine
- Cystathionuria
- Ethanolamine
- FeCl3 Screen
- Ferric chloride screen
- Glutamic acid
- Histidine
- Isoleucine
- Leucine
- Lysine
- Methionine
- Ornithine
- Phosphoethanolamine
- Sarcosine
- Serine
- Taurine
- Threonine
- Valine
- Arginosuccinic acid
- Glutamine
- Stanford Rapid Amino Acids

**COLLECTION**

**Patient Preparation:**
A 4 hour fast before specimen collection is preferred. If the patient has not been fasting indicate that on the test order.

The test request should be accompanied by a brief clinical history, the tentative diagnosis, and a listing of drugs, x-rays, infant formula or dietary therapy administered within the previous 3 days.

**Sample Type:**
Heparinized plasma, serum acceptable

**Collect:**
Dark Green top or Light Green top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.5 mL serum or plasma

**Remarks:**
If a disorder of the urea cycle is suspected, specify that the laboratory should look for argininosuccinic acid, as well. If abnormal, will comment if present. Call for phone consult with Dr. Tina Cowan (650) 724-7858

**PROCESSING**

**Test Code:**
AAQTS

**Test Group:**
Amino Acids

**Sendout:**
Yes

**Performing Lab:**
Lucille-Packard Children's Hospital

**Specimen Preparation:**
Freeze at -20C.

For requests for 'stat' testing contact MEDSPEED courier at 877-790-5122 and request Stat courier to Stanford at 3373 Hillview Ave. Palo Alto, CA 94304. Provide courier with the pick-up location, type of sample (frozen) and number of samples.

**Preferred Volume:**
1 mL serum or plasma

**Minimum Volume:**
0.5 mL serum or plasma

**RESULT INTERPRETATION**

**Reference Interval:**
See report

**ADMINISTRATIVE**

Printed 06/07/19
Test information subject to change
CPT Codes:
82139-90

LOINC Codes:
12176-4

COMPLETE VIEW

Approval Required:
Yes, if not ordered by Genetics or neurology. If ordered in previously diagnosed patients (see Utilization Guidelines).

Available Stat:
No, however, in exceptional circumstances when there is a need for rapid testing, courier transport to Stanford can be arranged (see 'Processing notes')

Ordering Recommendations:
This test should only be ordered for new diagnostic workup of patients with suspected disorders of amino acid metabolism. It should not be used for previously diagnosed patients for monitoring amino acid levels in response to treatment. For monitoring order "Quantitative Amino Acids, Plasma" test code "AMACP".

Test Code:
AAQTS

Test Group:
Amino Acids

Performing Lab:
Lucille-Packard Children's Hospital

Sendout:
Yes

Methodology:
Ion Exchange Chromatography

Patient Preparation:
A 4 hour fast before specimen collection is preferred. If the patient has not been fasting indicate that on the test order.

The test request should be accompanied by a brief clinical history, the tentative diagnosis, and a listing of drugs, x-rays, infant formula or dietary therapy administered within the previous 3 days.

Remarks:
If a disorder of the urea cycle is suspected, specify that the laboratory should look for argininosuccinic acid, as well. If abnormal, will comment if present. Call for phone consult with Dr. Tina Cowan (650) 724-7858

Collect:
Dark Green top or Light Green top

Amount to Collect:
2 mL blood

Sample Type:
Heparinized plasma, serum acceptable

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Specimen Preparation:
Freeze at -20C.

For requests for 'stat' testing contact MEDSPEED courier at 877-790-5122 and request Stat courier to Stanford at 3373 Hillview Ave. Palo Alto, CA 94304. Provide courier with the pick-up location, type of sample (frozen) and number of samples.

Reference Interval:
See report

Synonyms:
- Glycine
- Homocystine
- Tyrosine
• Alpha-keto acids
• Arginine
• Arginosuccinase deficiency
• Arginosuccinate Lyase deficiency
• Aspartate
• Aspartic acid
• Beta-aminoisobutyric acid
• Citrulline
• Cystathionine
• Cystathionuria
• Ethanolamine
• FeCl3 Screen
• Ferric chloride screen
• Glutamic acid
• Histidine
• Isoleucine
• Leucine
• Lysine
• Methionine
• Ornithine
• Phosphoethanolamine
• Sarcosine
• Serine
• Taurine
• Threonine
• Valine
• Arginosuccinic acid
• Glutamine
• Stanford Rapid Amino Acids

Reported:
Set up as needed, at least 2x a week. Turnaround time: One week.

CPT Codes:
82139-90

LOINC Codes:
12176-4
Quinidine
QUIND

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: FPIA
Reported: Test performed daily. Turnaround time 5 - 7 days.
Synonyms: Cardioquin, Quinidex

COLLECTION

Sample Type: Serum or plasma
Collect: Red top (Gold top NOT acceptable), Lavendar top, Dark green top, Light green top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Remarks: Collect specimen as a trough
Stability (from collection to initiation): Room temperature 4 days, refrigerated 1 week.
Unacceptable Conditions: Collected in Gold top.

PROCESSING

Test Code: QUIND
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Separate serum and refrigerate. Order Quest # 66944P
Preferred Volume: 1 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Unacceptable Conditions: Collected in Gold top.
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week.

RESULT INTERPRETATION

Units:
- mg/L

Reference Interval:
- Therapeutic: 2.0-5.0 mg/L

Critical Values:
- UCSF: >= 5 mg/L
- Quest priority-1: >= 10 mg/L

ADMINISTRATIVE

CPT Codes:
- 80194-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- QUIIND

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- FPIA

Remarks:
- Collect specimen as a trough

Collect:
- Red top (Gold top NOT acceptable), Lavendar top, Dark green top, Light green top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 1 mL serum or plasma

Minimum Volume:
- 0.2 mL serum or plasma

Unacceptable Conditions:
- Collected in Gold top.

Specimen Preparation:
- Separate serum and refrigerate. Order Quest # 66944P

Units:
- mg/L

Reference Interval:
- Therapeutic: 2.0-5.0 mg/L

Critical Values:
- UCSF: >= 5 mg/L
- Quest priority-1: >= 10 mg/L

Synonyms:
- Cardioquin
- Quinidex
Stability (from collection to initiation):
  Room temperature 4 days, refrigerated 1 week.

Reported:
  Test performed daily. Turnaround time 5 - 7 days.

CPT Codes:
  80194-90
Rabies Vaccine Response
RABET

ORDERING

Available Stat: No
Performing Lab: K-State rabies Laboratory via Quest
Methodology: Rapid florescent focus inhibition
Reported: Test set up Monday and Thursday. Turn around time 7-10 days
Additional Information: In humans, a titer of 1:5 or greater is considered acceptable as per ACIP. If the end point titer is <1:5, recommend booster vaccination be given.
Synonyms:
- Rabies, Antibody, Post-exposure immunization
- Rabies, Antibody, Prophylactic immunization
- RABE
- Rabies vaccine response
- Rabies Antibody, Post-vaccination titer

COLLECTION

Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 5 mL blood
Preferred Volume: 2 mL serum
Minimum Volume: 1 mL serum
Stability (from collection to initiation):
Refrigerated 2 weeks, frozen at -20C 4 weeks.
Unacceptable Conditions:
Gross hemolysis or lipemia.

PROCESSING

Test Code: RABET
Sendout: Yes
Performing Lab: K-State rabies Laboratory via Quest
Specimen Preparation:
Refrigerate serum. Order Quest test # 141283P
Preferred Volume: 2 mL serum
Minimum Volume:
1 mL serum

**Unacceptable Conditions:**
- Gross hemolysis or lipemia.

**Stability (from collection to initiation):**
- Refrigerated 2 weeks, frozen at -20C 4 weeks.

### RESULT INTERPRETATION

**Units:**
- IU/mL

**Reference Interval:**
- A result >= 0.1 IU/mL is considered acceptable per ACIP.

**Additional Information:**
- In humans, a titer of 1:5 or greater is considered acceptable as per ACIP. If the end point titer is <1:5, recommend booster vaccination be given.

### ADMINISTRATIVE

**CPT Codes:**
- 86317-90

**LOINC Codes:**
- 43590-9

### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- RABET

**Performing Lab:**
- K-State rabies Laboratory via Quest

**Sendout:**
- Yes

**Methodology:**
- Rapid fluorescent focus inhibition

**Collect:**
- Gold top or Red top

**Amount to Collect:**
- 5 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Unacceptable Conditions:**
- Gross hemolysis or lipemia.

**Specimen Preparation:**
- Refrigerate serum. Order Quest test # 141283P

**Units:**
- IU/mL

**Reference Interval:**
- A result >= 0.1 IU/mL is considered acceptable per ACIP.

**Synonyms:**
- Rabies, Antibody, Post-exposure immunization
- Rabies, Antibody, Prophylactic immunization
- RABE
- Rabies vaccine response
- Rabies Antibody, Post-vaccination titer

**Stability (from collection to initiation):**
- Refrigerated 2 weeks, frozen at -20°C 4 weeks.

**Reported:**
- Test set up Monday and Thursday. Turn around time 7-10 days

**Additional Information:**
- In humans, a titer of 1:5 or greater is considered acceptable as per ACIP. If the end point titer is <1:5, recommend booster vaccination be given.

**CPT Codes:**
- 86317-90

**LOINC Codes:**
- 43590-9
**Rabies, Antigen (DFA) & Culture**

**P319**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
California Department of Public Health, CDC

**COLLECTION**

**Sample Type:**
Skin biopsy, Saliva, CSF

**Collect:**
Red top, sputum cup, CSF tube or sterile collection tube

**Remarks:**
Call Microbiology (415-353-1268) for assistance in arranging specimen collection and referral to State Viral and Rickettsial Diseases Laboratory via SFPH.

Submit all sample types whenever possible: saliva, CSF, serum, and skin biopsy of posterior hairline.

For cases of suspected human rabies, call the VRDL Medical Epidemiology and Liaison Section (MELS) at 510-307-8585 for a consultation.

**PROCESSING**

**Test Code:**
P319

**Test Group:**
Rabies

**Sendout:**
Yes

**Performing Lab:**
California Department of Public Health, CDC

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
P319

**Test Group:**
Rabies

**Performing Lab:**
California Department of Public Health, CDC

**Sendout:**
Yes

**Remarks:**
Call Microbiology (415-353-1268) for assistance in arranging specimen collection and referral to State Viral and Rickettsial Diseases Laboratory via SFPH.

Submit all sample types whenever possible: saliva, CSF, serum, and skin biopsy of posterior hairline.

For cases of suspected human rabies, call the VRDL Medical Epidemiology and Liaison Section (MELS) at 510-307-8585 for a consultation.

**Collect:**
- Red top, sputum cup, CSF tube or sterile collection tube

**Sample Type:**
- Skin biopsy, Saliva, CSF

**Reference Interval:**
- Negative
Rapid HSV DNA, CSF
P377

ORDERING

Ordering Recommendations:
CSF testing should not be ordered on an immunocompetent patient unless there is no other explanation for CSF findings AND there are > 5 cells/mm³ or a protein of > 50 mg/dL. These criteria do not apply if the patient is immunocompromised.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Daily, all shifts

Methodology:
RT-PCR

Reported:
1 day

Additional Information:
Quantification can be performed on positive samples by ordering add-on HSV PCR, quantitative test

Synonyms:
• HSV PCR

COLLECTION

Sample Type:
CSF

Collect:
CSF tube

Amount to Collect:
1 mL CSF

Preferred Volume:
1 mL CSF

Minimum Volume:
0.5 mL CSF

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month

PROCESSING

Test Code:
P377

Test Group:
Herpes simplex

Performing Lab:
Microbiology

Specimen Preparation:
Send to CB ASAP at room temperature

Preferred Volume:
1 mL CSF

Minimum Volume:
0.5 mL CSF

Stability (from collection to initiation):
Refrigerated 1 week, frozen 1 month
RESULT INTERPRETATION

Reference Interval:
   Not detected

Critical Values:
   Detected

Additional Information:
   Quantification can be performed on positive samples by ordering add-on HSV PCR, quantitative test

ADMINISTRATIVE

CPT Codes:
   87529 x2

LOINC Codes:
   16952-4, 16960-7

COMPLETE VIEW

Available Stat:
   No

Ordering Recommendations:
   CSF testing should not be ordered on an immuncompetent patient unless there is no other explanation for CSF findings AND there are > 5 cells/mm3 or a protein of > 50 mg/dL These criteria do not apply if the patient is immunocompromised.

Test Code:
   P377

Test Group:
   Herpes simplex

Performing Lab:
   Microbiology

Performed:
   Daily, all shifts

Methodology:
   RT-PCR

Collect:
   CSF tube

Amount to Collect:
   1 mL CSF

Sample Type:
   CSF

Preferred Volume:
   1 mL CSF

Minimum Volume:
   0.5 mL CSF

Specimen Preparation:
   Send to CB ASAP at room temperture

Reference Interval:
   Not detected

Critical Values:
   Detected

Synonyms:
   - HSV PCR

Stability (from collection to initiation):
   Refrigerated 1 week, frozen 1 month
Reported: 1 day

Additional Information:
Quantification can be performed on positive samples by ordering add-on HSV PCR, quantitative test

CPT Codes:
87529 x2

LOINC Codes:
16952-4, 16960-7
Rapid HSV DNA, skin lesion/blood
P378

ORDERING

Performing Lab:
Microbiology

Performed:
DAILY

Methodology:
Real time PCR detection and thermal melt analysis

Reported:
1 day

Additional Information:
The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.

Synonyms:
• HERPES, HSV

COLLECTION

Sample Type:
Swab from cutaneous or mucocutaneous lesion

Collect:
Flocked swab in universal transport medium (UTM), lavender top (blood)

Amount to Collect:
1 flocked swab

Preferred Volume:
1 flocked swab

Minimum Volume:
1 flocked swab

Remarks:
Unroof lesion and swab fluid of vesicle and base of lesion to obtain cells. Immediately place swab in UTM.

If testing of BAL/bronchial wash, body fluids, or tissue is required, order Herpes Simplex Virus PCR, Quantitative.

Do not draw blood from heparin containing lines.

Stability (from collection to initiation):
Room Temp, Refrigerated 5 days, Frozen 1 month

Unacceptable Conditions:
Samples not received in suitable container/transport medium. Unsuitable specimen types. Samples may not be shared with VZV DFA testing.

PROCESSING

Test Code:
P378

Performing Lab:
Microbiology

Preferred Volume:
1 flocked swab

Minimum Volume:
1 flocked swab

Unacceptable Conditions:
Samples not received in suitable container/transport medium. Unsuitable specimen types. Samples may not be shared with VZV DFA testing.
Stability (from collection to initiation):
Room Temp, Refrigerated 5 days, Frozen 1 month

RESULT INTERPRETATION

Reference Interval:
Not detected

Additional Information:
The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.

ADMINISTRATIVE

CPT Codes:
87529 x 2

LOINC Codes:
20444-6

COMPLETE VIEW

Test Code:
P378

Performing Lab:
Microbiology

Performed:
DAILY

Methodology:
Real time PCR detection and thermal melt analysis

Remarks:
Unroof lesion and swab fluid of vesicle and base of lesion to obtain cells. Immediately place swab in UTM.

If testing of BAL/bronchial wash, body fluids, or tissue is required, order Herpes Simples Virus PCR, Quantitative.

Do not draw blood from heparin containing lines.

Collect:
Flocked swab in universal transport medium(UTM), lavender top (blood)

Amount to Collect:
1 flocked swab

Sample Type:
Swab from cutaneous or mucocutaneous lesion

Preferred Volume:
1 flocked swab

Minimum Volume:
1 flocked swab

Unacceptable Conditions:
Samples not received in suitable container/transport medium. Unsuitable specimen types. Samples may not be shared with VZV DFA testing.

Reference Interval:
Not detected

Synonyms:
- HERPES, HSV

Stability (from collection to initiation):
Room Temp, Refrigerated 5 days, Frozen 1 month

Reported:
1 day

Additional Information:
The assay may not detect co-infection of HSV 1 and HSV 2 in specimens where the two virus types are not equally represented.

CPT Codes:
87529 x 2

LOINC Codes:
20444-6
Rapid Influenza A/B/RSV RNA

ORDERING

Ordering Recommendations:

Testing algorithm:

Patient with suspected respiratory viral infection

Is patient exhibiting URI symptoms?

Yes, take NP swab

Order Rapid Influenza A / B / RSV PCR (Nasopharyngeal swab samples only)

Extended virus panel needed? (Immunocompromised / Transplant / ICU)

Yes

Order Respiratory Viral Panel PCR (NP swab or other respiratory sample)

Available Stat:

No

Performing Lab:

Microbiology

Performed:

Daily, all shifts

Methodology:

Real-time PCR

Reported:

1 day

Additional Information:

Samples other than NP swabs are not validated for the PCR testing. Therefore if samples other than NP swab are received the order will be converted to an Respiratory Virus panel PCR (test code P350) and that test will be performed and billed for.

COLLECTION

Sample Type:

Nasopharyngeal swab
Collect:
Flocked swab in Universal Transport Medium (UTM)

Amount to Collect:
1 flocked swab in Universal Transport Medium

Preferred Volume:
1 flocked swab in Universal Transport Medium

Minimum Volume:
1 flocked swab in Universal Transport Medium

Remarks:
Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Stability (from collection to initiation):
Refrigerated 24 hours, frozen 1 month

Unacceptable Conditions:
Specimens other than nasopharyngeal swabs, incorrect container type (see 'Additional information') More than one specimen per day

PROCESSING

Test Code:
P372

Performing Lab:
Microbiology

Preferred Volume:
1 flocked swab in Universal Transport Medium

Minimum Volume:
1 flocked swab in Universal Transport Medium

Unacceptable Conditions:
Specimens other than nasopharyngeal swabs, incorrect container type (see 'Additional information') More than one specimen per day

Stability (from collection to initiation):
Refrigerated 24 hours, frozen 1 month

RESULT INTERPRETATION

Reference Interval:
Not detected

Critical Values:
Positive results on inpatients and patients currently in the Emergency Department

Additional Information:
Samples other than NP swabs are not validated for the the PCR testing. Therefore if samples other than NP swab are received the order will be converted to an Respiratory Virus panel PCR (test code P350) and that test will be performed and billed for.

ADMINISTRATIVE

CPT Codes:
87631

LOINC Codes:
77022-2, 76078-5, 76080-1

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Testing algorithm:

Patient with suspected respiratory viral infection

Is patient exhibiting URI symptoms? 

Yes 

Take NP swab

Order Rapid Influenza A / B / RSV PCR  
(Nasopharyngeal swab samples only)

Extended virus panel needed?  
(Immunocompromised / Transplant / ICU)

Yes

Order Respiratory Viral Panel PCR  
(NP swab or other respiratory sample)

Test Code: P372
Performing Lab: Microbiology
Performed: Daily, all shifts
Methodology: Real-time PCR
Remarks: 

Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

Collect: 
Flocked swab in Universal Transport Medium (UTM)

Amount to Collect: 
1 flocked swab in Universal Transport Medium

Sample Type: Nasopharyngeal swab

Preferred Volume: 
1 flocked swab in Universal Transport Medium

Minimum Volume: 
1 flocked swab in Universal Transport Medium

Unacceptable Conditions: 
Specimens other than nasopharyngeal swabs, incorrect container type (see ‘Additional information’) More than one specimen per day

Reference Interval:
Not detected

**Critical Values:**
- Positive results on inpatients and patients currently in the Emergency Department

**Stability (from collection to initiation):**
- Refrigerated 24 hours, frozen 1 month

**Reported:**
- 1 day

**Additional Information:**
- Samples other than NP swabs are not validated for the PCR testing. Therefore if samples other than NP swab are received the order will be converted to an Respiratory Virus panel PCR (test code P350) and that test will be performed and billed for.

**CPT Codes:**
- 87631

**LOINC Codes:**
- 77022-2, 76078-5, 76080-1
**RARA Break-apart Rearrangement FISH**

**RARA, BRARA**

### ORDERING

**Performing Lab:**
- Cytogenetics

**Performed:**
- Monday - Friday, 9 am to 5 pm

**Methodology:**
- FISH

**Reported:**
- 7-14 days

**Synonyms:**
- RARA
- BRARA
- 17q21 break-apart FISH

### COLLECTION

**Sample Type:**
- blood, bone marrow aspirate, bone marrow core

**Collect:**
- Blood and bone marrow aspirate: Dark green top
- Bone marrow core: Sterile container

**Amount to Collect:**
- See Preferred Volume

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen.

### PROCESSING

**Test Code:**
- Blood: BRARA
- Bone marrow: RARA

**Performing Lab:**
- Cytogenetics

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- See Preferred Volume

Test information subject to change.
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen.

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

---

**ADMINISTRATIVE**

**CPT Codes:**
- 88271x2, 88275x1

---

**COMPLETE VIEW**

**Test Code:**
- Blood: BRARA
- Bone marrow: RARA

**Performing Lab:**
- Cytogenetics

**Performed:**
- Monday - Friday, 9 am to 5 pm

**Methodology:**
- FISH

**Collect:**
- Blood and bone marrow aspirate: Dark green top
- Bone marrow core: Sterile container

**Amount to Collect:**
- See Preferred Volume

**Sample Type:**
- blood, bone marrow aspirate, bone marrow core

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples. Samples received refrigerated or frozen.

**Synonyms:**
- RARA
- BRARA
- 17q21 break-apart FISH

**Storage/Transport Temperature:**
- Room temperature

**Stability (from collection to initiation):**
- 2 days

**Reported:**
- 7-14 days

**CPT Codes:**
- 88271x2, 88275x1

---

Test information subject to change

Printed 06/07/19
RBC Associated Drug Antibodies
MOLT

ORDERING

Approval Required:
Yes, Contact Blood Bank Resident at x3-1313 (Moffitt-Long) or 6-1404 (Mission Bay).

Available Stat:
No

Performing Lab:
American Red Cross Immunhematology Reference Lab (Pomona, CA)

Performed:
Test set up Monday-Friday.

Reported:
4-7 days

Additional Information:
Testing includes a direct Coombs test (DAT), eluate and/or serum testing with drug-treated RBCs and/or in the presence of a solution of the drug (dependent upon drug under investigation); possible additional testing may be performed as needed.

Transfusion Service MDs will discuss case with the reference lab to determine if a sample of the drug is needed or not. When indicated, a vial of the drug or 2-4 capsules/tablets should be provided for testing. Powder forms of drug should not be dissolved prior to sending.

Synonyms:
- Drug-induced hemolytic anemia investigation

COLLECTION

Sample Type:
Serum and EDTA anti-coagulated whole blood

A sample of some suspected drugs may also be required (see Additional Information section).

Collect:
2 Red tops, 2 Lavender tops

Amount to Collect:
Red top: 2 x 10 mL blood
Labender (EDTA) top: 2 x 6 mL

Preferred Volume:
12 mL whole blood, 8 mL Serum

Minimum Volume:
12 mL whole blood, 8 mL Serum

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.

Name of the suspected drug(s) should be included in the order.

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
American Red Cross Immunhematology Reference Lab (Pomona, CA)
**Specimen Preparation:**
Send samples to blood bank to be shipped to American Red Cross Reference Lab. Do not separate plasma or serum.

**Preferred Volume:**
12 mL whole blood, 8 mL Serum

**Minimum Volume:**
12 mL whole blood, 8 mL Serum

**Unacceptable Conditions:**
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

---

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
Testing includes a direct Coombs test (DAT), eluate and/or serum testing with drug-treated RBCs and/or in the presence of a solution of the drug (dependent upon drug under investigation); possible additional testing may be performed as needed.

Transfusion Service MDs will discuss case with the reference lab to determine if a sample of the drug is needed or not. When indicated, a vial of the drug or 2-4 capsules/tablets should be provided for testing. Powder forms of drug should not be dissolved prior to sending.

---

**COMPLETE VIEW**

**Approval Required:**
Yes, Contact Blood Bank Resident at x3-1313 (Moffitt-Long) or 6-1404 (Mission Bay).

**Available Stat:**
No

**Test Code:**
MOLT

**Performing Lab:**
American Red Cross Immunhematology Reference Lab (Pomona, CA)

**Sendout:**
Yes

**Performed:**
Test set up Monday-Friday.

**Remarks:**
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.

Name of the suspected drug(s) should be included in the order.

**Collect:**
2 Red tops, 2 Lavender tops

**Amount to Collect:**
Red top: 2 x 10 mL blood
Labender (EDTA) top: 2 x 6 mL

**Sample Type:**
Serum and EDTA anti-coagulated whole blood

A sample of some suspected drugs may also be required (see Additional Information section).

**Preferred Volume:**
12 mL whole blood, 8 mL Serum

**Minimum Volume:**
12 mL whole blood, 8 mL Serum

**Unacceptable Conditions:**
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

**Specimen Preparation:**
Send samples to blood bank to be shipped to American Red Cross Reference Lab. Do not separate plasma or serum.
Reference Interval:
  Negative
Synonyms:
  ● Drug-induced hemolytic anemia investigation
Reported:
  4-7 days
Additional Information:
  Testing includes a direct Coombs test (DAT), eluate and/or serum testing with drug-treated RBCs and/or in the presence of a solution of the drug (dependent upon drug under investigation); possible additional testing may be performed as needed.

  Transfusion Service MDs will discuss case with the reference lab to determine if a sample of the drug is needed or not. When indicated, a vial of the drug or 2-4 capsules/tablets should be provided for testing. Powder forms of drug should not be dissolved prior to sending.
RBC Count  
CBC, CBCD, RBC

ORDERING

Available Stat:  
Yes

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:  
Test available 24 hours per day 7 days per week

Reported:  
STAT 1 hour, Routine 4 hours

Synonyms:
- Erythrocyte count
- rbc

COLLECTION

Sample Type:  
EDTA whole blood

Collect:  
Lavender top

Amount to Collect:  
3 mL blood

Preferred Volume:  
3 mL blood

Minimum Volume:  
1 mL blood (250 µL in pedi-bullet)

PROCESSING

Test Code:  
CBC, CBCD, RBC

Test Group:  
RBC

Performing Lab:  
Parnassus, Mission Bay & Mt. Zion Hematology

Preferred Volume:  
3 mL blood

Minimum Volume:  
1 mL blood (250 µL in pedi-bullet)

RESULT INTERPRETATION

Units:  
x10^{12}/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>4.0-6.6 x10^{12}/L</td>
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<tr>
<td>8-14 days</td>
<td>3.9-6.3 x10^{12}/L</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>3.6-6.2 x10^{12}/L</td>
</tr>
<tr>
<td>Age Group</td>
<td>Count</td>
</tr>
<tr>
<td>--------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>0-7 days</td>
<td>4.0-6.6 x10^{12}/L</td>
</tr>
<tr>
<td>8-14 days</td>
<td>3.9-6.3 x10^{12}/L</td>
</tr>
<tr>
<td>2-4 weeks</td>
<td>3.6-6.2 x10^{12}/L</td>
</tr>
<tr>
<td>1- &lt; 2 months</td>
<td>3.0-5.4 x10^{12}/L</td>
</tr>
<tr>
<td>2- &lt; 3 months</td>
<td>2.7-4.9 x10^{12}/L</td>
</tr>
<tr>
<td>3- &lt; 6 months</td>
<td>3.1-4.5 x10^{12}/L</td>
</tr>
<tr>
<td>6- &lt; 24 months</td>
<td>3.7-4.7 x10^{12}/L</td>
</tr>
<tr>
<td>2- &lt; 6 years</td>
<td>3.9-4.9 x10^{12}/L</td>
</tr>
<tr>
<td>6- &lt; 12 years</td>
<td>4.0-5.0 x10^{12}/L</td>
</tr>
<tr>
<td>Male 12- &lt; 18 years</td>
<td>4.2-5.6 x10^{12}/L</td>
</tr>
<tr>
<td>Male &gt;= 18 years</td>
<td>4.4-5.9 x10^{12}/L</td>
</tr>
<tr>
<td>Female &gt;= 12 years</td>
<td>4.0-5.2 x10^{12}/L</td>
</tr>
</tbody>
</table>

**Administrative**

**CPT Codes:**

85041

**Complete View**

**Available Stat:**

Yes

**Test Code:**

CBC, CBCD, RBC

**Test Group:**

RBC

**Performing Lab:**

Parnassus, Mission Bay & Mt. Zion Hematology

**Performed:**

Test available 24 hours per day 7 days per week

**Collect:**

Lavender top

**Amount to Collect:**

3 mL blood

**Sample Type:**

EDTA whole blood

**Preferred Volume:**

3 mL blood

**Minimum Volume:**

1 mL blood (250 µL in pedi-bullet)

**Units:**

x10^{12}/L

**Reference Interval:**
Male >= 18 years 4.4-5.9 x10^{12}/L
Female >= 12 years 4.0-5.2 x10^{12}/L

Synonyms:
- Erythrocyte count
- rbc

Reported:
- STAT 1 hour, Routine 4 hours

CPT Codes:
- 85041
Red cell Indices
CBC, CBCD

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Calculated from Hct, Hgb and RBC
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
- MCV is directly measured
- $\text{MCH} = \frac{\text{Hgb} \times 10}{\text{RBC}}$ (in millions)
- $\text{MCHC} = \frac{\text{Hgb} \times 100}{\text{Hct}}$

The MCV is used to determine if the red cells are normocytic, microcytic and macrocytic. The MCHC is used to determine if the red cells are normochromic, hypochromic or hyperchromic, the latter seen almost exclusively in spherocytosis. The MCH is a relatively useless parameter.

Synonyms:
- RBC indices

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

PROCESSING

Test Code:
CBC, CBCD
Test Group:
RBC
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
fl, pg, g/dl

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>MCV</th>
<th>MCH</th>
<th>MCHC</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-7 days</td>
<td>95-121 fl</td>
<td>31-37 pg</td>
<td>29-37 g/dL</td>
</tr>
<tr>
<td>1- &lt;2 weeks</td>
<td>88-120 fl</td>
<td>28-40 pg</td>
<td>28-38 g/dL</td>
</tr>
<tr>
<td>2- &lt;4 weeks</td>
<td>86-118 fl</td>
<td>28-40 pg</td>
<td>28-38 g/dL</td>
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<tr>
<td>1- &lt;2 months</td>
<td>85-117 fl</td>
<td>28-40 pg</td>
<td>29-37 g/dL</td>
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<td>77-115 fl</td>
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<td>29-37 g/dL</td>
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<td>3- &lt;6 months</td>
<td>74-108 fl</td>
<td>25-34 pg</td>
<td>30-36 g/dL</td>
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<tr>
<td>6- &lt;24 months</td>
<td>70-86 fl</td>
<td>23-31 pg</td>
<td>30-36 g/dL</td>
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<td>2- &lt;6 years</td>
<td>75-87 fl</td>
<td>24-30 pg</td>
<td>31-36 g/dL</td>
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<tr>
<td>6- &lt;12 years</td>
<td>77-95 fl</td>
<td>25-33 pg</td>
<td>31-36 g/dL</td>
</tr>
<tr>
<td>12- &lt;18 years</td>
<td>78-98 fl</td>
<td>25-34 pg</td>
<td>31-36 g/dL</td>
</tr>
<tr>
<td>&gt;= 18 years</td>
<td>80-100 fl</td>
<td>26-34 pg</td>
<td>31-36 g/dL</td>
</tr>
</tbody>
</table>

Additional Information:
MCV is directly measured
MCH = Hgb x 10/RBC (in millions)
MCHC = Hgb(in g/dL) x 100/Hct

The MCV is used to determine if the red cells are normocytic, microcytic and macrocytic. The MCHC is used to determine if the red cells are normochromic, hypochromic or hyperchromic, the latter seen almost exclusively in spherocytosis. The MCH is a relatively useless parameter.
<table>
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<tr>
<th>Age</th>
<th>MCV</th>
<th>MCH</th>
<th>MCHC</th>
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<td>88-120 fL</td>
<td>28-40 pg</td>
<td>28-38 g/dL</td>
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<td>86-118 fL</td>
<td>28-40 pg</td>
<td>28-38 g/dL</td>
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<td>85-117 fL</td>
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<td>3- &lt;6 months</td>
<td>74-108 fL</td>
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<td>31-36 g/dL</td>
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<tr>
<td>&gt;= 18 years</td>
<td>80-100 fL</td>
<td>26-34 pg</td>
<td>31-36 g/dL</td>
</tr>
</tbody>
</table>

**Synonyms:**
- RBC indices

**Reported:**
- STAT 1 hour, Routine 4 hours

**Additional Information:**
- MCV is directly measured
- MCH = Hgb x 10/RBC (in millions)
- MCHC = Hgb(in g/dL) x 100/Hct

The MCV is used to determine if the red cells are normocytic, microcytic and macrocytic. The MCHC is used to determine if the red cells are normochromic, hypochromic or hyperchromic, the latter seen almost exclusively in spherocytosis. The MCH is a relatively useless parameter.

**CPT Codes:**
- 85027
Red cell Phenytoin

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Parnassus Blood Bank

**Performed:**
Test set up Monday-Friday.

**Reported:**
2-4 days

**Additional Information:**
Includes the commonly clinically significant RBC antigens: C, c, E, e, M, N, S, s, K (Kell), JKa and JKB (Kidd) & Fya and Fyb (Duffy) typing.  
RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Caucasian</th>
<th>African-American</th>
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**COLLECTION**

**Sample Type:**
EDTA whole blood

**Collect:**
Lavender top (6 mL size preferred)

**Amount to Collect:**
6 mL blood

**Preferred Volume:**
6 mL blood

**Minimum Volume:**
3 mL blood

**Remarks:**
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Unacceptable Conditions:**
Unsigned, mislabeled or unlabeled sample

**PROCESSING**

**Test Code:**
PHEN

**Performing Lab:**
Parnassus Blood Bank
Specimen Preparation:
Do not centrifuge.

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Unacceptable Conditions:
Unsigned, mislabeled or unlabeled sample

RESULT INTERPRETATION

Additional Information:
Includes the commonly clinically significant RBC antigens: C, c, E, e, M, N, S, s, K (Kell), JKa and Jkb (Kidd) & Fya and Fyb (Duffy) typing.

RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

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<th>Antigen</th>
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ADMINISTRATIVE

CPT Codes:
86905 x 12

LOINC Codes:
820-1

COMPLETE VIEW

Available Stat:
No

Test Code:
PHEN

Performing Lab:
Parnassus Blood Bank

Performed:
Test set up Monday-Friday.

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

**Minimum Volume:**
3 mL blood

**Unacceptable Conditions:**
Unsigned, mislabeled or unlabeled sample

**Specimen Preparation:**
Do not centrifuge.

**Reported:**
2-4 days

**Additional Information:**
Includes the commonly clinically significant RBC antigens: C, c, E, e, M, N, S, s, K (Kell), JKa and JKb (Kidd) & Fya and Fyb (Duffy) typing.

RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

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**CPT Codes:**
86905 x 12

**LOINC Codes:**
820-1
Reducing Substances, stool
RSST

ORDERING

Available Stat:  
No
Performing Lab:  
Mission Bay Hematology
Performed:  
Run 0800-1600 daily.
Methodology:  
copper reduction
Reported:  
1 day
Additional Information:  
Reducing substances, if present, are reported semiquantitatively as equivalent to the activity of 0 (negative), 250, 500, 750, 1000, 2000 or > 2000 mg/dL of glucose (these correspond to the formerly used readings of negative, trace, 1+, etc.).

Although sucrose is not a reducing sugar it is extensively hydrolyzed by stool flora to the reducing sugars glucose and fructose and thus is detected in the assay for reducing substances in stool.

Acid hydrolysis to detect stool sucrose is unnecessary and will not be done.

See also pH, stool

Synonyms:  
- Acid hydrolysis
- Reducing sugars
- Disaccharide deficiency
- stool analysis

COLLECTION

Sample Type:  
Fresh liquid stool
Collect:  
Clean container
Amount to Collect:  
See preferred volume
Preferred Volume:  
10 gm
Stability (from collection to initiation):  
Frozen: 72 hours
Storage/Transport Temperature:  
Frozen
Unacceptable Conditions:  
Formed stool received.

PROCESSING

Test Code:  
RSST
Test Group:  
Reducing substances
Performing Lab: Mission Bay Hematology

Preferred Volume: 10 gm

Unacceptable Conditions: Formed stool received.

Stability (from collection to initiation): Frozen: 72 hours

Storage/Transport Temperature: Frozen

RESULT INTERPRETATION

Units: mg/dL
Reference Interval: <500 mg/dL

Additional Information:
Reducing substances, if present, are reported semiquantitatively as equivalent to the activity of 0 (negative), 250, 500, 750, 1000, 2000 or > 2000 mg/dL of glucose (these correspond to the formerly used readings of negative, trace, 1+, etc.).

Although sucrose is not a reducing sugar it is extensively hydrolyzed by stool flora to the reducing sugars glucose and fructose and thus is detected in the assay for reducing substances in stool.

Acid hydrolysis to detect stool sucrose is unnecessary and will not be done.

See also pH, stool

ADMINISTRATIVE

CPT Codes: 84999
LOINC Codes: 11060-1

COMPLETE VIEW

Available Stat: No
Test Code: RSST
Test Group: Reducing substances
Performing Lab: Mission Bay Hematology
Performed: Run 0800-1600 daily.
Methodology: copper reduction
Collect: Clean container
Amount to Collect: See preferred volume
Sample Type: Fresh liquid stool
Preferred Volume:
10 gm

**Unacceptable Conditions:**
Formed stool received.

**Units:**
mg/dL

**Reference Interval:**
<500 mg/dL

**Synonyms:**
- Acid hydrolysis
- Reducing sugars
- Disaccharide deficiency
- Stool analysis

**Storage/Transport Temperature:**
Frozen

**Stability (from collection to initiation):**
Frozen: 72 hours

**Reported:**
1 day

**Additional Information:**
Reducing substances, if present, are reported semiquantitatively as equivalent to the activity of 0 (negative), 250, 500, 750, 1000, 2000 or > 2000 mg/dL of glucose (these correspond to the formerly used readings of negative, trace, 1+, etc.).

Although sucrose is not a reducing sugar it is extensively hydrolyzed by stool flora to the reducing sugars glucose and fructose and thus is detected in the assay for reducing substances in stool.

Acid hydrolysis to detect stool sucrose is unnecessary and will not be done.

See also pH, stool

**CPT Codes:**
84999

**LOINC Codes:**
11060-1
Reducing Substances, urine
RSUU

ORDERING

Available Stat: No
Performing Lab: Mission Bay Hematology
Performed: Run 0800-1600 daily.
Methodology: Copper reduction
Reported: 1 day
Additional Information: Detects reducing substances in addition to glucose, which is tested as part of Urinalysis, Routine. Detection of these substances is also part of the Metabolic Error Screen.

Note: Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

Synonyms:
- Reducing sugars
- Acid hydrolysis

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 1 mL urine
Stability (from collection to initiation): Refrigerated: 72 hours
Storage/Transport Temperature: Refrigerated

PROCESSING

Test Code: RSUU
Test Group: Reducing substances
Performing Lab: Mission Bay Hematology
Preferred Volume: 1 mL urine
Stability (from collection to initiation): Refrigerated: 72 hours
Storage/Transport Temperature:
RESULT INTERPRETATION

Units:
  mg/dL
Reference Interval:
  Negative
Additional Information:
  Detects reducing substances in addition to glucose, which is tested as part of Urinalysis, Routine. Detection of these substances is also part of the Metabolic Error Screen.

  Note: Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

ADMINISTRATIVE

CPT Codes:
  81002
LOINC Codes:
  5809-9

COMPLETE VIEW

Available Stat:
  No
Test Code:
  RSUU
Test Group:
  Reducing substances
Performing Lab:
  Mission Bay Hematology
Performed:
  Run 0800-1600 daily.
Methodology:
  Copper reduction
Collect:
  Urine cup
Amount to Collect:
  See preferred volume
Sample Type:
  Random urine
Preferred Volume:
  1 mL urine
Units:
  mg/dL
Reference Interval:
  Negative
Synonyms:
  • Reducing sugars
  • Acid hydrolysis
Storage/Transport Temperature:
  Refrigerated
Stability (from collection to initiation):
Refrigerated: 72 hours

**Reported:**
- 1 day

**Additional Information:**
- Detects reducing substances in addition to glucose, which is tested as part of Urinalysis, Routine. Detection of these substances is also part of the Metabolic Error Screen.

**Note:** Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

**CPT Codes:**
- 81002

**LOINC Codes:**
- 5809-9
Reflex to SNP Array
RSNPA

ORDERING

Approval Required:
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows.

Requests on inpatients require approval from Cytogenetics/Array staff.

Performing Lab:
Cytogenetics

Performed:
Monday to Friday 8:00 AM to 4:30 PM

Reported:
Varies pending primary culture and results, generally 7-14 days after chromosome results

Synonyms:
- Chromosome test reflex to SNP array, SNP test pending other test results

COLLECTION

Patient Preparation:
None

Sample Type:
Amniotic Fluid, CVS, Tissue, Blood

Collect:
See primary test container type (amnio, CVS, Tissue), lavender top, dark green top or extracted DNA.

Amount to Collect:
See preferred volume.

Preferred Volume:
- Adult: 5 mL whole blood
- Infant/child: 3 mL whole blood
- Extracted DNA: 10 micrograms

Minimum Volume:
- Adult: 2 mL whole blood
- Infant/child: 2 mL whole blood
- Extracted DNA: 10 micrograms

Remarks:
Maintain samples at room temperature during transport to the laboratory.

Stability (from collection to initiation):
See Primary test stability

Unacceptable Conditions:
- Insufficient volume, unlabeled tubes, clotted samples, Samples received in Lithium-heparin (Lt. Green top) tubes

PROCESSING

Test Code:
RSNPA

Test Group:
Cytogenetics - Microarray

Performing Lab:
Cytogenetics

Specimen Preparation:
Refrigerate samples. DO NOT CENTRIFUGE OR FREEZE. For questions, contact the microarray laboratory at 514-8964
Preferred Volume:
Adapt: 5 mL whole blood
Infant/child: 3 mL whole blood
Extracted DNA: 10 micrograms

Minimum Volume:
Adult: 2 mL whole blood
Infant/child: 2 mL whole blood
Extracted DNA: 10 micrograms

Unacceptable Conditions:
Insufficient volume, unlabeled tubes, clotted samples, Samples received in Lithium-heparin (Lt. Green top) tubes

Stability (from collection to initiation):
See Primary test stability

ADMINISTRATIVE

LDT or Modified FDA:
Yes

COMPLETE VIEW

Approval Required:
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows.
Requests on inpatients require approval from Cytogenetics/Array staff.
Insurance authorization required.

Test Code:
RSNPA

Test Group:
Cytogenetics - Microarray

Performing Lab:
Cytogenetics

Performed:
Monday to Friday 8:00 AM to 4:30 PM

Patient Preparation:
None

Remarks:
Maintain samples at room temperature during transport to the laboratory.

Collect:
See primary test container type (amnio, CVS, Tissue), lavender top, dark green top or extracted DNA.

Amount to Collect:
See preferred volume.

Sample Type:
Amniotic Fluid, CVS, Tissue, Blood

Preferred Volume:
Adult: 5 mL whole blood
Infant/child: 3 mL whole blood
Extracted DNA: 10 micrograms

Minimum Volume:
Adult: 2 mL whole blood
Infant/child: 2 mL whole blood
Extracted DNA: 10 micrograms

Unacceptable Conditions:
Insufficient volume, unlabeled tubes, clotted samples, Samples received in Lithium-heparin (Lt. Green top) tubes

Specimen Preparation:
Refrigerate samples. DO NOT CENTRIFUGE OR FREEZE. For questions, contact the microarray laboratory at 514-8964
Synonyms:
  • Chromosome test reflex to SNP array, SNP test pending other test results

Stability (from collection to initiation):
  See Primary test stability

Reported:
  Varies pending primary culture and results, generally 7-14 days after chromosome results

LDT or Modified FDA:
  Yes
Relapsing Fever
P409

ORDERING

Available Stat: 
No
Performing Lab: 
Microbiology
Performed: 
Monday - Friday, day shift only
Methodology: 
Microscopic examination of thick and thin Giemsa stained smears
Reported: 
1-3 days
Additional Information: 
The agents which cause Relapsing Fever may be very difficult to detect if the reviewer is not aware of the need to look for them.
No serologic test is available for these organisms.
Synonyms: 
- Borreliosis
- Borrelia

COLLECTION

Sample Type: 
EDTA whole blood
Collect: 
Lavender top
Amount to Collect: 
3 mL blood
Preferred Volume: 
3 mL blood
Minimum Volume: 
1 mL blood
Remarks: 
Samples should be taken during bouts of fever as spirochetes are most likely to be present. Call Microbiology (x3-1268) and inform the staff of the need to look for the spirochetes of B. duttoni or B. recurrentis.
Request test on the Microbiology requisition.

PROCESSING

Test Code: 
P409
Performing Lab: 
Microbiology
Specimen Preparation: 
Prepare thin and thick smears immediately upon sample receipt.
Preferred Volume: 
3 mL blood
Minimum Volume: 
1 mL blood
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
The agents which cause Relapsing Fever may be very difficult to detect if the reviewer is not aware of the need to look for them.

No serologic test is available for these organisms.

ADMINISTRATIVE

CPT Codes:
87207

COMPLETE VIEW

Available Stat:
No

Test Code:
P409

Performing Lab:
Microbiology

Performed:
Monday - Friday, day shift only

Methodology:
Microscopic examination of thick and thin Giemsa stained smears

Remarks:
Samples should be taken during bouts of fever as spirochetes are most likely to be present. Call Microbiology (x3-1268) and inform the staff of the need to look for the spirochetes of B. duttoni or B. recurrentis.

Request test on the Microbiology requisition.

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Specimen Preparation:
Prepare thin and thick smears immediately upon sample receipt.

Reference Interval:
Negative

Synonyms:
- Borreliosis
- Borrelia

Reported:
1-3 days

Additional Information:
The agents which cause Relapsing Fever may be very difficult to detect if the reviewer is not aware of the need to look for them.

No serologic test is available for these organisms.

CPT Codes:
Reptilase Time

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Clot based assay
Reported: Test run Wednesday Turnaround 1-8 days
Additional Information:
A normal reptilase time in the setting of a prolonged thrombin time indicates the presence of an inhibitor of thrombin. Unlike the thrombin time, the Reptilase Clotting Time is not prolonged by use of heparin or hirudin.

The reptilase time can also be used as a screening test for dysfibrinogenemia. Confirmatory testing for dysfibrinogen is by comparison of functional and immunologic fibrinogen levels.

COLLECTION

Sample Type: Citrated plasma
Collect: Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL blood
Preferred Volume: 1 mL plasma
Minimum Volume: 0.5 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Rejection Criteria:
Received refrigerated or room temperature.

PROCESSING

Test Code: REPT
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Specimen to be delivered to hematology lab for centrifugation and freezing prior to send out. Transport frozen on dry ice to China Basin. Do not allow the specimen to thaw. Order Quest # 37700X

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Rejection Criteria:
Received refrigerated or room temperature.

RESULT INTERPRETATION

Units:
seconds
Reference Interval:
15-19 seconds

Additional Information:
A normal reptilase time in the setting of a prolonged thrombin time indicates the presence of an inhibitor of thrombin. Unlike the thrombin time, the Reptilase Clotting Time is not prolonged by use of heparin or hirudin.

The reptilase time can also be used as a screening test for dysfibrinogenemia. Confirmatory testing for dysfibrinogen is by comparison of functional and immunologic fibrinogen levels.

ADMINISTRATIVE

CPT Codes:
85635-90

LOINC Codes:
6683-7

COMPLETE VIEW

Available Stat:
No

Test Code:
REPT

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Clot based assay

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Rejection Criteria:
Received refrigerated or room temperature.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Specimen to be delivered to hematology lab for centrifugation and freezing prior to send out. Transport frozen on dry ice to China Basin. Do not allow the specimen to thaw. Order Quest # 37700X

Units:
seconds

Reference Interval:
15-19 seconds

Reported:
Test run Wednesday Turnaround 1-8 days

Additional Information:
A normal reptilase time in the setting of a prolonged thrombin time indicates the presence of an inhibitor of thrombin. Unlike the thrombin time, the Reptilase Clotting Time is not prolonged by use of heparin or hirudin.

The reptilase time can also be used as a screening test for dysfibrinogenemia. Confirmatory testing for dysfibrinogen is by comparison of functional and immunologic fibrinogen levels.

CPT Codes:
85635-90

LOINC Codes:
6683-7
Respiratory Virus PCR Panel
P370

ORDERING

Ordering Recommendations:

Testing algorithm:

Patient with suspected respiratory viral infection

Is patient exhibiting URI symptoms?

Yes

Take NP swab

Order Rapid Influenza A / B / RSV PCR
(Nasopharyngeal swab samples only)

Extended virus panel needed?
(Immunocompromised / Transplant / ICU)

Yes

Order Respiratory Viral Panel PCR
(NP swab or other respiratory sample)

Institute Droplet Precautions

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Test performed minimum of 3x per week

Methodology:
Multiplex Reverse Transcription PCR

Reported:
2-3 days

Additional Information:
Detected RSV A, RSV B, Influenza A, Influenza A subtype H1, Influenza A subtype H3, Influenza B, Parainfluenza 1, Parainfluenza 2, Parainfluenza 3, Human Metapneumovirus, Rhinovirus, and Adenovirus.

Negative results do not preclude respiratory virus infection and should not be used as the sole basis for diagnosis, treatment or other management decisions.

Testing of specimens other than NP swabs falls outside of the approved manufacturer's specimen recommendation as prescribed in the NxTAG-RPP package insert. The performance of this assay has been determined by the UCSF laboratory as acceptable for alternative respiratory specimen types such as BAL, bronchial wash, endotrachael aspirate, etc. Results should be used in conjunction with clinical
findings.

The primers for detection of Rhinovirus have been shown to cross-react with Enterovirus.

**Synonyms:**
- RSV A
- RSV B
- Influenza A
- Influenza A subtype H1
- Influenza A subtype H3
- Influenza B
- Parainfluenza 1
- Parainfluenza 2
- Parainfluenza 3
- Human Metapneumovirus
- Rhinovirus
- Adenovirus.

**COLLECTION**

**Sample Type:**
- Nasopharyngeal swab (preferred), nasal wash or aspirate, tracheal aspirate, BAL, bronchial wash

**Collect:**
- Nasopharyngeal swab: Flocked swab in Universal Transport Medium (UTM)
- Other samples: Clean container

**Amount to Collect:**
- Nasopharyngeal swab: 1 flocked swab
- Fluid: 2 mL

**Preferred Volume:**
- Nasopharyngeal swab: 1 flocked swab
- Fluid: 2 mL

**Minimum Volume:**
- Nasopharyngeal swab: 1 flocked swab
- Fluid: 1 mL

**Remarks:**
- Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.

**Stability (from collection to initiation):**
- Refrigerated 1 week, frozen at -70C 1 month

**Unacceptable Conditions:**
- Nasopharyngeal swab not collected using flocked swab/UTM kit.

**PROCESSING**

**Test Code:**
- P370

**Performing Lab:**
- Microbiology

**Preferred Volume:**
- Nasopharyngeal swab: 1 flocked swab
- Fluid: 2 mL

**Minimum Volume:**
- Nasopharyngeal swab: 1 flocked swab

Printed 06/07/19
Test information subject to change
Fluid: 1 mL

Unacceptable Conditions:
- Nasopharyngeal swab not collected using flocked swab/UTM kit.

Stability (from collection to initiation):
- Refrigerated 1 week, frozen at -70°C 1 month

RESULT INTERPRETATION

Reference Interval:
- Not detected

Critical Values:
- Positive for Influenza A or B, or positive for RSV on inpatients and patients currently in the Emergency Department.

Additional Information:
- Detects RSV A, RSV B, Influenza A, Influenza A subtype H1, Influenza A subtype H3, Influenza B, Parainfluenza 1, Parainfluenza 2, Parainfluenza 3, Human Metapneumovirus, Rhinovirus, and Adenovirus.

Negative results do not preclude respiratory virus infection and should not be used as the sole basis for diagnosis, treatment or other management decisions.

Testing of specimens other than NP swabs falls outside of the approved manufacturer's specimen recommendation as prescribed in the NxTAG-RPP package insert. The performance of this assay has been determined by the UCSF laboratory as acceptable for alternative respiratory specimen types such as BAL, bronchial wash, endotracheal aspirate, etc. Results should be used in conjunction with clinical findings.

The primers for detection of Rhinovirus have been shown to cross-react with Enterovirus.

ADMINISTRATIVE

CPT Codes:
- 87633

LDT or Modified FDA:
- Yes

LOINC Codes:
- Note: New reporting format requires LOINC codes for individual viruses in panel.
- 34487-9, 49521-8, 49524-2, 40982-1, 30075-6, 30076-4, 29908-1, 29909-9, 29910-7, 40991-2, 38917-1, 39528-5

COMPLETE VIEW

Available Stat:
- No

Ordering Recommendations:
Testing algorithm:

Patient with suspected respiratory viral infection

- Is patient exhibiting URI symptoms?
  - Yes: Take NP swab
  - No
- Order Rapid Influenza A / B / RSV PCR
  (Nasopharyngeal swab samples only)

- Extended virus panel needed?
  (Immunocompromised / Transplant / ICU)
  - Yes
    - Order Respiratory Viral Panel PCR
      (NP swab or other respiratory sample)
Test Code:
P370
Performing Lab:
Microbiology
Performed:
Test performed minimum of 3x per week
Methodology:
Multiplex Reverse Transcription PCR
Remarks:
Nasopharyngeal swab: Use flocked swab/Universal Transport Medium for collection. Insert swab into the nostril, gently rotating the swab inward until resistance is met at the level of the turbinates. Rotate the swab a few times against the nasopharyngeal wall (approximately 10 sec) and then withdraw swab. Insert swab into container with Universal Transport Medium. Break end of swab so top of vial can be screwed on securely. Appropriately label specimen and send to the laboratory.
Collect:
Nasopharyngeal swab: Flocked swab in Universal Transport Medium (UTM)
Other samples: Clean container
Amount to Collect:
Nasopharyngeal swab: 1 flocked swab
Fluid: 2 mL
Sample Type:
Nasopharyngeal swab (preferred), nasal wash or aspirate, trachael aspirate, BAL, bronchial wash
Preferred Volume:
Nasopharyngeal swab: 1 flocked swab
Fluid: 2 mL
Minimum Volume:
Nasopharyngeal swab: 1 flocked swab
Fluid: 1 mL
Unacceptable Conditions:
Nasopharyngeal swab not collected using flocked swab/UTM kit.
Reference Interval:
Not detected
Critical Values:
Positive for Influenza A or B, or positive for RSV on inpatients and patients currently in the Emergency Department.
Synonyms:
• RSV A
• RSV B
• Influenza A
• Influenza A subtype H1
• Influenza A subtype H3
• Influenza B
• Parainfluenza 1
• Parainfluenza 2
• Parainfluenza 3
• Human Metapneumovirus
• Rhinovirus
• Adenovirus.
Stability (from collection to initiation):
Refrigerated 1 week, frozen at -70°C 1 month
Reported:
2-3 days
Additional Information:
Detects RSV A, RSV B, Influenza A, Influenza A subtype H1, Influenza A subtype H3, Influenza B, Parainfluenza 1, Parainfluenza 2, Parainfluenza 3, Human Metapneumovirus, Rhinovirus, and Adenovirus.
Negative results do not preclude respiratory virus infection and should not be used as the sole basis for diagnosis, treatment or other management decisions.

Testing of specimens other than NP swabs falls outside of the approved manufacturer’s specimen recommendation as prescribed in the NxTAG-RPP package insert. The performance of this assay has been determined by the UCSF laboratory as acceptable for alternative respiratory specimen types such as BAL, bronchial wash, endotrachael aspirate, etc. Results should be used in conjunction with clinical findings.

The primers for detection of Rhinovirus have been shown to cross-react with Enterovirus.

CPT Codes:
87633

LDT or Modified FDA:
Yes

LOINC Codes:
Note: New reporting format requires LOINC codes for individual viruses in panel.
34487-9, 49521-8, 49524-2, 40982-1, 30075-6, 30076-4, 29908-1, 29909-9, 29910-7, 40991-2, 38917-1, 39528-5

Test information subject to change
Reticulocyte Count

RET

ORDERING

Available Stat:  No
Performing Lab:  Parnassus, Mission Bay and Mt. Zion Hematology
Performed:  Test available 24 hours per day 7 days per week.
Methodology:  Flow cytometry and/or light microscopy
Reported:  Turnaround time 24 hours.
Additional Information:  If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.
Synonyms:  • Retic count

COLLECTION

Sample Type:  EDTA whole blood
Collect:  Lavender top
Amount to Collect:  3 mL blood
Preferred Volume:  3 mL blood
Minimum Volume:  1 mL blood
Stability (from collection to initiation):  Specimens are stable at room temperature for 48 hours, for 72 hours at 4C.

PROCESSING

Test Code:  RET
Performing Lab:  Parnassus, Mission Bay and Mt. Zion Hematology
Specimen Preparation:  Do not centrifuge.

When a Reticulocyte Count must be performed manually and an RBC count is not available from a CBC or CBCD on the same sample, order an RBC.
Preferred Volume:  3 mL blood
Minimum Volume:  1 mL blood
Stability (from collection to initiation):  Specimens are stable at room temperature for 48 hours, for 72 hours at 4C.

RESULT INTERPRETATION
Units:
$x10^9$/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;= 4 days</td>
<td>65-230 x10^9/L</td>
<td>65-230 x10^9/L</td>
</tr>
<tr>
<td>5-30 days</td>
<td>17-114 x10^9/L</td>
<td>17-86 x10^9/L</td>
</tr>
<tr>
<td>31-60 days</td>
<td>30-129 x10^9/L</td>
<td>52-112 x10^9/L</td>
</tr>
<tr>
<td>61-180 days</td>
<td>36-127 x10^9/L</td>
<td>44-116 x10^9/L</td>
</tr>
<tr>
<td>6 months - 2 years</td>
<td>36-91 x10^9/L</td>
<td>40-90 x10^9/L</td>
</tr>
<tr>
<td>2 years - &lt; 6 years</td>
<td>35-89 x10^9/L</td>
<td>35-93 x10^9/L</td>
</tr>
<tr>
<td>6 years - &lt; 12 years</td>
<td>31-98 x10^9/L</td>
<td>35-124 x10^9/L</td>
</tr>
<tr>
<td>12 years - &lt;18 years</td>
<td>38-104 x10^9/L</td>
<td>35-97 x10^9/L</td>
</tr>
<tr>
<td>&gt;= 18 years (Automated)</td>
<td>29.0-121.4 x10^9/L</td>
<td>25.6-96.9 x10^9/L</td>
</tr>
<tr>
<td>&gt;= 18 years (Manual)*</td>
<td>21.6-115.9 x10^9/L</td>
<td>16.2-99.8 x10^9/L</td>
</tr>
</tbody>
</table>

*Manual methods are much less accurate, and give somewhat lower results (reference range: Male >=18 year old 21.6-115.9 x 10^9/L, Female >=18 year old 16.2 - 99.8 x 10^9/L). A manual assay will be performed if required due to sample or fluorescent assay problem. For <18 year old refer to the normal range table above.

The ranges 5 days to <18 years have been extrapolated from the following reference: Steven J. Soldin, Carlo Brugnara, et al. Pediatric reference ranges, 2nd ed. Washington, DC: AACC Press, 1997

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

**ADMINISTRATIVE**

CPT Codes:
- 85045

LOINC Codes:
- 14196-0

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- RET

Performing Lab:
- Parnassus, Mission Bay and Mt. Zion Hematology

Performed:
- Test available 24 hours per day 7 days per week.

Methodology:
- Flow cytometry and/or light microscopy

Collect:
- Lavender top

Amount to Collect:
- 3 mL blood

Sample Type:
- EDTA whole blood

Preferred Volume:
- 3 mL blood

Minimum Volume:
- 1 mL blood

Specimen Preparation:
Do not centrifuge.

When a Reticulocyte Count must be performed manually and an RBC count is not available from a CBC or CBCD on the same sample, order an RBC.

Units:

\( \times 10^9/L \)

Reference Interval:

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*Manual methods are much less accurate, and give somewhat lower results (reference range: Male >=18 year old 21.6-115.9 x 10^9/L, Female >=18 year old 16.2 - 99.8 x 10^9/L). A manual assay will be performed if required due to sample or fluorescent assay problem. For <18 year old refer to the normal range table above.

The ranges 5 days to <18 years have been extrapolated from the following reference: Steven J. Soldin, Carlo Brugnara, et al. Pediatric reference ranges, 2nd ed. Washington, DC: AACC Press, 1997

Synonyms:
- Retic count

Stability (from collection to initiation):
Specimens are stable at room temperature for 48 hours, for 72 hours at 4C.

Reported:
Turnaround time 24 hours.

Additional Information:
If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

CPT Codes:
- 85045

LOINC Codes:
- 14196-0
Rh only

ORDERING

Available Stat:  
Yes

Performing Lab:  
Parnassus, Mission Bay and MtZ Blood Banks

Performed:  
Test available 24 hours per day 7 days per week

Reported:  
STAT 1 hour, ASAP 2 hours Routine 4 hours

Additional Information:  
When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported.

Reflex Testing:  
Cord blood: If baby and mother are both Rh Negative on initial testing, weak D testing will be automatically performed on the cord sample and charged for.

Synonyms:  
- Rh typing
- Rhesus typing
- cord blood tests

COLLECTION

Sample Type:  
EDTA whole blood

Collect:  
Lavender top (6 mL size preferred)

Amount to Collect:  
6 mL blood

Preferred Volume:  
6 mL blood

Minimum Volume:  
3 mL blood

Remarks:  
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:  
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code:  
RH

Test Group:  
ABO / Rh

Performing Lab:  
Parnassus, Mission Bay and MtZ Blood Banks

Specimen Preparation:  
Maintain samples at room temperature and provide to Blood Bank asap.

Preferred Volume:  
6 mL blood
Minimum Volume:
3 mL blood

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:
When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported.

COMPLETE VIEW

Available Stat:
Yes
Test Code:
RH
Test Group:
ABO / Rh
Performing Lab:
Parnassus, Mission Bay and MtZ Blood Banks
Performed:
Test available 24 hours per day 7 days per week
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL blood
Sample Type:
EDTA whole blood
Preferred Volume:
6 mL blood
Minimum Volume:
3 mL blood
Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.
Specimen Preparation:
Maintain samples at room temperature and provide to Blood Bank asap.
Synonyms:
- Rh typing
- Rhesus typing
- cord blood tests
Reported:
STAT 1 hour, ASAP 2 hours Routine 4 hours
Reflex Testing:
Cord blood: If baby and mother are both Rh Negative on initial testing, weak D testing will be automatically performed on the cord sample and charged for.
Additional Information:
When and if following bone marrow or liver transplantation there is disagreement between the results of ABO or Rh results based on testing of RBCs ("forward" testing) and results based on testing of plasma ("reverse" testing), the discrepancy will be reported.
Rh Phenotyping
RHGT

ORDERING

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test set up Monday-Friday.

Reported:
3-5 days

Additional Information:
Includes typing for C, c, D, E and e.

Frequencies of Rh Antigens:
RBC antigen % of antigen negative donors
(Caucasian) % of antigen negative donors (African-American)
D 15 8
C 32 73
c 20 4
E 71 78
e 2 2


COLLECTION

Sample Type:
EDTA whole blood

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
3 mL blood

Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code:
RHGT

Performing Lab:
Parnassus & Mission Bay Blood Banks

Specimen Preparation:
Do not centrifuge.

Preferred Volume:
6 mL blood
**Minimum Volume:**
3 mL blood

**Unacceptable Conditions:**
Unsigned, mislabeled, unlabeled or hemolyzed sample.

### RESULT INTERPRETATION

**Additional Information:**
Includes typing for C, c, D, E and e.

**Frequencies of Rh Antigens:**

<table>
<thead>
<tr>
<th>RBC antigen</th>
<th>% of antigen negative donors (Caucasian)</th>
<th>% of antigen negative donors (African-American)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>32</td>
<td>73</td>
</tr>
<tr>
<td>c</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>71</td>
<td>78</td>
</tr>
<tr>
<td>e</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>


### ADMINISTRATIVE

**CPT Codes:**
86906

**LOINC Codes:**
10331-7

### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
RHGT

**Performing Lab:**
Parnassus & Mission Bay Blood Banks

**Performed:**
Test set up Monday-Friday.

**Remarks:**
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Collect:**
Lavender top (6 mL size preferred)

**Amount to Collect:**
6 mL blood

**Sample Type:**
EDTA whole blood

**Preferred Volume:**
6 mL blood

**Minimum Volume:**
3 mL blood

**Unacceptable Conditions:**
Unsigned, mislabeled, unlabeled or hemolyzed sample.

**Specimen Preparation:**
Do not centrifuge.

**Reported:**
3-5 days

**Additional Information:**
Includes typing for C, c, D, E and e.

**Frequencies of Rh Antigens:**
RBC antigen % of antigen negative donors
(Caucasian) % of antigen negative donors (African-American)

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Caucasian</th>
<th>African-American</th>
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</thead>
<tbody>
<tr>
<td>D</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
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<td>73</td>
</tr>
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<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>


**CPT Codes:**
86906

**LOINC Codes:**
10331-7

Test information subject to change
Rheumatoid Factor, serum
RF

ORDERING
Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Rate nephelometry
Reported: 1-3 days
Synonyms:
• RF

COLLECTION
Sample Type: Serum
Collect:
Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic sample.

PROCESSING
Test Code:
RF
Test Group:
RF
Performing Lab:
Immunology
Specimen Preparation:
Refrigerate.
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic sample.

RESULT INTERPRETATION
Units:
IU/mL
Reference Interval:
<40 IU/mL

ADMINISTRATIVE

CPT Codes:
86430
LOINC Codes:
15205-8

COMPLETE VIEW

Available Stat:
No
Test Code:
RF
Test Group:
RF
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Rate nephelometry
Collect:
Gold top
Amount to Collect:
1 mL blood
Sample Type:
Serum
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Unacceptable Conditions:
Lipemic sample.
Specimen Preparation:
Refrigerate.
Units:
IU/mL
Reference Interval:
<40 IU/mL
Synonyms:
• RF
Reported:
1-3 days
CPT Codes:
86430
LOINC Codes:
15205-8
Ribosomal P Antibody

**ORDERING**

Available Stat: No
Performing Lab: Quest
Methodology: Immunoasay
Additional Information: Ribosomal P Antibody is present in 5-10% of patients with Systemic Lupus Erythematosus (SLE) but is highly specific for this disorder. The levels parallel disease activity and it may be particularly useful in patients with CNS involvement.

**COLLECTION**

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Room temperature 4 days, refrigerated 1 week, frozen 1 month

**PROCESSING**

Test Code: RIBP
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze sample. Ship to CB frozen.
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Room temperature 4 days, refrigerated 1 week, frozen 1 month

**RESULT INTERPRETATION**

Units: Al
Reference Interval: <1.0 Al
Additional Information:
Ribosomal P Antibody is present in 5-10% of patients with Systemic Lupus Erythematosus (SLE) but is highly specific for this disorder. The levels parallel disease activity and it may be particularly useful in patients with CNS involvement.

**ADMINISTRATIVE**

**CPT Codes:**
83516-90

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
RIBP

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Immunoasay

**Collect:**
Red top or Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Specimen Preparation:**
Aliquot and freeze sample. Ship to CB frozen.

**Units:**
AI

**Reference Interval:**
<1.0 AI

**Stability (from collection to initiation):**
Room temperature 4 days, refrigerated 1 week, frozen 1 month

**Additional Information:**
Ribosomal P Antibody is present in 5-10% of patients with Systemic Lupus Erythematosus (SLE) but is highly specific for this disorder. The levels parallel disease activity and it may be particularly useful in patients with CNS involvement.

**CPT Codes:**
83516-90
Rickettsial Antibody Panel
RICK

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: IFA
Reported: 3-5 days

Additional Information:
Antigen-specific IgG and IgM titers allow rapid diagnosis of infection by organisms within either of the two major groups of Rickettsia. The spotted fever group includes R. rickettsia (Rocky Mountain Spotted Fever) and R. akari (Rickettsial pox). The typhus group includes R. typhi (endemic/maurine typhus) and R. prowazeki (epidemic typhus).

Titers will be billed separately from the initial screening test. Use titer billing codes (RMSFGT, RMSFMT, RTYPGT, RTYPMT) as appropriate.

Synonyms:
- Typhus
- RMSF
- Rocky Mountain Spotted Fever
- Rickettsial pox
- Rickettsialpox

COLLECTION

Sample Type: Serum
Collect: Gold top or Red top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum

Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 2 weeks, frozen 1 month

Unacceptable Conditions:
Gross hemolysis or lipemia

Rejection Criteria:
Gross hemolysis or lipemia

PROCESSING

Test Code: RICK
Sendout: Yes
Performing Lab:

Test information subject to change
Quest

**Specimen Preparation:**
Aliquot and freeze. Transport to CB frozen. Order Quest test code 37507.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
Gross hemolysis or lipemia

**Rejection Criteria:**
Gross hemolysis or lipemia

**Stability (from collection to initiation):**
Room temperature 1 week, Refrigerated 2 weeks, frozen 1 month

---

**RESULT INTERPRETATION**

**Reference Interval:**
Not detected

**Additional Information:**
Antigen-specific IgG and IgM titers allow rapid diagnosis of infection by organisms within either of the two major groups of Rickettsia. The spotted fever group includes R. rickettsia (Rocky Mountain Spotted Fever) and R. akari (Rickettsial pox). The typhus group includes R. typhi (endemic/maurine typhus) and R. prowazeki (epidemic typhus).

Titers will be billed separately from the initial screening test. Use titer billing codes (RMSFGT, RMSFMT, RTYPGT, RTYPMT) as appropriate.

---

**ADMINISTRATIVE**

**CPT Codes:**
86757-90 x4

---

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
RICK

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
IFA

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Rejection Criteria:**
Gross hemolysis or lipemia
Unacceptable Conditions:
Gross hemolysis or lipemia

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 37507.

Reference Interval:
Not detected

Synonyms:
- Typhus
- RMSF
- Rocky Mountain Spotted Fever
- Rickettsial pox
- Rickettsialpox

Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 2 weeks, frozen 1 month

Reported:
3-5 days

Additional Information:
Antigen-specific IgG and IgM titers allow rapid diagnosis of infection by organisms within either of the two major groups of Rickettsia. The spotted fever group includes R. rickettsia (Rocky Mountain Spotted Fever) and R. akari (Rickettsial pox). The typhus group includes R. typhi (endemic/maurine typhus) and R. prowazeki (epidemic typhus).

Titers will be billed separately from the initial screening test. Use titer billing codes (RMSFGT, RMSFMT, RTYPGT, RTYPMT) as appropriate.

CPT Codes:
86757-90 x4
Ristocetin Aggregation
RIST

ORDERING

Approval Required:
Test run by appointment only. Contact Hematology at x3-1747.

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Run as needed Monday - Friday, day shift only.

Methodology:
Platelet aggregometry

Reported:
1-3 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A platelet count is required for the performance of this assay and will be ordered and separately charged.

Test RIST, Ristocetin Aggregation, is a platelet aggregation using only ristocetin at both normal and low dose concentrations. No other agonists are used.

Platelets in plasma from vWD Type-2B patients have a heightened response to “low dose” ristocetin.

In Type 2B VWD, the mutant vWf has an abnormally enhanced tendency to bind to platelets.

Synonyms:
- Ristocetin activity
- von Willebrand
- RIPA
- Ristocetin induced platelet aggregation

COLLECTION

Patient Preparation:
Patient should be rested, fasting since midnight, and no smoking before blood collection. No caffeine and no alcohol for 48 hours prior to testing. Take only medication as directed by physician before testing.

Sample Type:
Citrated whole blood

Collect:
Blue top tube (x6)

Amount to Collect:
20 mL blood

Preferred Volume:
20 mL blood

Minimum Volume:
17 mL blood

Remarks:
By appointment only, contact Hematology at x3-1747.

Samples are only collected by Hematology techs.
Test Code: RIST
Test Group: vWD
Performing Lab: Parnassus Hematology
Preferred Volume: 20 mL blood
Minimum Volume: 17 mL blood

RESULT INTERPRETATION

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

A platelet count is required for the performance of this assay and will be ordered and separately charged.

Test RIST, Ristocetin Aggregation, is a platelet aggregation using only ristocetin at both normal and low dose concentrations. No other agonists are used.

Platelets in plasma from vWD Type-2B patients have a heightened response to “low dose” ristocetin.

In Type 2B VWD, the mutant vWF has an abnormally enhanced tendency to bind to platelets.

ADMINISTRATIVE

CPT Codes:
85576 x2
LOINC Codes:
24380-8

COMPLETE VIEW

Approval Required:
Test run by appointment only. Contact Hematology at x3-1747.

Available Stat:
No

Test Code: RIST
Test Group: vWD
Performing Lab: Parnassus Hematology

Performed:
Run as needed Monday - Friday, day shift only.

Methodology:
Platelet aggregometry

Patient Preparation:
Patient should be rested, fasting since midnight, and no smoking before blood collection. No caffeine and no alcohol for 48 hours prior to testing. Take only medication as directed by physician before testing.

Remarks:
By appointment only, contact Hematology at x3-1747.

Samples are only collected by Hematology techs.
Collect:
  Blue top tube (x6)
Amount to Collect:
  20 mL blood
Sample Type:
  Citrated whole blood
Preferred Volume:
  20 mL blood
Minimum Volume:
  17 mL blood
Synonyms:
  • Ristocetin activity
  • von Willebrand
  • RIPA
  • Ristocetin induced platelet aggregation
Reported:
  1-3 days
Additional Information:
  An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.
  A platelet count is required for the performance of this assay and will be ordered and separately charged.
  Test RIST, Ristocetin Aggregation, is a platelet aggregation using only ristocetin at both normal and low dose concentrations. No other agonists are used.
  Platelets in plasma from vWD Type-2B patients have a heightened response to "low dose" ristocetin.
  In Type 2B VWD, the mutant vWF has an abnormally enhanced tendency to bind to platelets.
CPT Codes:
  85576 x2
LOINC Codes:
  24380-8
Ristocetin Cofactor Activity
RCOF

ORDERING

Ordering Recommendations:
When von Willebrand Factor activity/Ristocetin Cofactor activity is requested, it is appropriate to perform both the Ristocetin Cofactor activity and von Willebrand Factor antigen. For this reason, both will be performed if RCOF is ordered. In the uncommon circumstance the provider wishes to perform only the Ristocetin Cofactor activity, Parnassus Hematology should be contacted at 415-353-1747.

Approval Required:
No. If testing needed outside of defined testing schedule then approval is required.

Available Stat:
No, Contact hematology x3-1747 for special testing needs.

Performing Lab:
Parnassus Hematology

Performed:
Performed once every 1 - 2 weeks from 0800 - 1600

Methodology:
Platelet agglutination

Reported:
1-14 days

Additional Information:
Von Willebrand Factor is necessary for platelet adhesion to injured endothelium.

Ristocetin Cofactor is useful in assessing binding of von Willebrand Factor to platelet factor GP1b. When combined with other tests, results are useful in diagnosis of von Willebrand Disease and in categorizing types of von Willebrand Disease.

According to National Heart Lung and Blood Institute von Willebrand Disease Clinical Practice guidelines (http://www.nhlbi.nih.gov/guidelines/vwd/index.htm), a ratio of Ristocetin Cofactor/von Willebrand Factor Antigen of <0.5-0.7 may indicate the presence of a qualitative abnormality in von Willebrand Factor (i.e. Type 2 von Willebrand Disease), provided that Ristocetin Cofactor activity and/or von Willebrand Factor Antigen are below normal. Ristocetin Cofactor/von Willebrand Factor Antigen ratios in an internal UCSF study (December 2008, 39 normal blood donors with normal Ristocetin Cofactor activity and normal von Willebrand Factor Antigen) were all >0.5.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Synonyms:
- vW Factor
- von Willebrand factor activity
- VWF activity

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:
Check the expiration date on the label of the blue top vacutainer before drawing the patient.

Avoid collecting when patient may be lipemic as this may result in sample rejection.
Stability (from collection to initiation):
Room temperature 4 hours, frozen at -20°C 2 weeks, frozen at -80°C 6 months.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Markedly lipemic samples may be rejected.

PROCESSING

Test Code:
RCOF

Test Group:
vWD

Performing Lab:
Parnassus Hematology

Specimen Preparation:
If this test is ordered together with Factor VIII Activity and Von Willebrand Factor Antigen on the same sample, enter VWP to request all three tests.

Take sample asap to Hematology for processing. Separate and freeze plasma at -20°C within 1 hour.

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Markedly lipemic samples may be rejected.

Stability (from collection to initiation):
Room temperature 4 hours, frozen at -20°C 2 weeks, frozen at -80°C 6 months.

RESULT INTERPRETATION

Units:
%

Reference Interval:
42-191%

Additional Information:
Von Willebrand Factor is necessary for platelet adhesion to injured endothelium.

Ristocetin Cofactor is useful in assessing binding of von Willebrand Factor to platelet factor GP1b. When combined with other tests, results are useful in diagnosis of von Willebrand Disease and in categorizing types of von Willebrand Disease.

According to National Heart Lung and Blood Institute von Willebrand Disease Clinical Practice guidelines (http://www.nhlbi.nih.gov/guidelines/vwd/index.htm), a ratio of Ristocetin Cofactor/von Willebrand Factor Antigen of <0.5-0.7 may indicate the presence of a qualitative abnormality in von Willebrand Factor (i.e. Type 2 von Willebrand Disease), provided that Ristocetin Cofactor activity and/or von Willebrand Factor Antigen are below normal. Ristocetin Cofactor/von Willebrand Factor Antigen ratios in an internal UCSF study (December 2008, 39 normal blood donors with normal Ristocetin Cofactor activity and normal von Willebrand Factor Antigen) were all >0.5.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

ADMINISTRATIVE

CPT Codes:
85245

LOINC Codes:
6014-5
Approval Required:
No. If testing needed outside of defined testing schedule then approval is required.

Available Stat:
No, Contact hematology x3-1747 for special testing needs.

Ordering Recommendations:
When von Willebrand Factor activity/Ristocetin Cofactor activity is requested, it is appropriate to perform both the Ristocetin Cofactor activity and von Willebrand Factor antigen. For this reason, both will be performed if RCOF is ordered. In the uncommon circumstance the provider wishes to perform only the Ristocetin Cofactor activity, Parnassus Hematology should be contacted at 415-353-1747.

Test Code:
RCOF

Test Group:
vWD

Performing Lab:
Parnassus Hematology

Performed:
Performed once every 1 - 2 weeks from 0800 - 1600

Methodology:
Platelet agglutination

Remarks:
Check the expiration date on the label of the blue top vacutainer before drawing the patient.

Avoid collecting when patient may be lipemic as this may result in sample rejection.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Markedly lipemic samples may be rejected.

Specimen Preparation:
If this test is ordered together with Factor VIII Activity and Von Willebrand Factor Antigen on the same sample, enter VWP to request all three tests.

Take sample asap to Hematology for processing. Separate and freeze plasma at -20C within 1 hour.

Units:
%

Reference Interval:
42-191%

Synonyms:
- vW Factor
- von Willebrand factor activity
- VWF activity

Stability (from collection to initiation):
Room temperature 4 hours, frozen at -20C 2 weeks. frozen at -80C 6 months.

Reported:
1-14 days

Additional Information:
Von Willebrand Factor is necessary for platelet adhesion to injured endothelium.

Ristocetin Cofactor is useful in assessing binding of von Willebrand Factor to platelet factor GP1b. When combined with other tests, results are useful in diagnosis of von Willebrand Disease and in categorizing types of von Willebrand Disease.
According to National Heart Lung and Blood Institute von Willebrand Disease Clinical Practice guidelines (http://www.nhlbi.nih.gov/guidelines/vwd/index.htm), a ratio of Ristocetin Cofactor/von Willebrand Factor Antigen of <0.5-0.7 may indicate the presence of a qualitative abnormality in von Willebrand Factor (i.e. Type 2 von Willebrand Disease), provided that Ristocetin Cofactor activity and/or von Willebrand Factor Antigen are below normal. Ristocetin Cofactor/von Willebrand Factor Antigen ratios in an internal UCSF study (December 2008, 39 normal blood donors with normal Ristocetin Cofactor activity and normal von Willebrand Factor Antigen) were all >0.5.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

**CPT Codes:**
- 85245

**LOINC Codes:**
- 6014-5
Rivaroxaban
RVX

ORDERING

Available Stat:
No

Performing Lab:
Parnassus Hematology

Performed:
Monday - Friday 0800-1600

Methodology:
Chromogenic anti-Factor Xa

Reported:
1-3 days

Additional Information:
Although the manufacturer of rivaroxaban (Xarelto, Bayer Healthcare AG) does not recommend routine monitoring, the Einstein-DVT-Dose-Ranging Study (Blood 2008;112:2242-2247 has found the following typical drug levels in patients taking rivaroxaban:

<table>
<thead>
<tr>
<th>Dose (mg)</th>
<th>Trough ng/mL</th>
<th>Peak ng/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>19-60*</td>
<td>175-360</td>
</tr>
<tr>
<td>30</td>
<td>24-83*</td>
<td>184-399</td>
</tr>
<tr>
<td>40</td>
<td>31-96</td>
<td>205-564</td>
</tr>
</tbody>
</table>

*At UCSF, the limit of detection for rivaroxaban is 25 ng/mL.

In this study, trough samples were taken just prior to drug administration and peak levels were drawn 2-6 hours after last intake.

In addition, Laboratory assessment of rivaroxaban: a review (Samama et al. Thrombosis Journal 2013, 11:11) found the following results typical in patients taking rivaroxaban following major orthopedic surgery:

<table>
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<th>Dose (mg)</th>
<th>Peak (ng/mL)</th>
<th>Trough (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>53</td>
<td>8*</td>
</tr>
<tr>
<td>5</td>
<td>86</td>
<td>11*</td>
</tr>
<tr>
<td>10</td>
<td>180</td>
<td>38</td>
</tr>
<tr>
<td>20</td>
<td>299</td>
<td>68</td>
</tr>
<tr>
<td>30</td>
<td>400</td>
<td>160</td>
</tr>
</tbody>
</table>

*At UCSF, the limit of detection for rivaroxaban is 25 ng/mL.

The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available in the laboratory manual for reference purposes only. Recommendations for rivaroxaban therapy and monitoring are available through the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

Synonyms:
- Xarelto
- Monitoring Anticoagulation
- Anti Factor 10a
- Anti Factor Xa

COLLECTION

Sample Type:
Citrated plasma

Collect:
Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

Amount to Collect:
2.7 or 1.8 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Remarks:

Printed 06/07/19
Test information subject to change
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

**Stability (from collection to initiation):**

Room temperature 4 hours

**Unacceptable Conditions:**

- Samples collected in outdated blue top vacutainer.
- Over-filled or under-filled tubes may be rejected

---

### PROCESSING

**Test Code:**

RVX

**Performing Lab:**

Parnassus Hematology

**Specimen Preparation:**

Deliver immediately to Hematology for processing.

**Preferred Volume:**

1 mL plasma

**Minimum Volume:**

0.5 mL plasma

**Unacceptable Conditions:**

- Samples collected in outdated blue top vacutainer.
- Over-filled or under-filled tubes may be rejected

**Stability (from collection to initiation):**

Room temperature 4 hours

---

### RESULT INTERPRETATION

**Units:**

ng/mL

**Reference Interval:**

See additional information

**Critical Values:**

>500 ng/mL

**Additional Information:**

Although the manufacturer of rivaroxaban (Xarelto, Bayer Healthcare AG) does not recommend routine monitoring, the Einstein-DVT-Dose-Ranging Study (Blood 2008;112:2242-2247 has found the following typical drug levels in patients taking rivaroxaban:

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<th>Dose</th>
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</tr>
</thead>
<tbody>
<tr>
<td>20mg QD</td>
<td>19-60*</td>
<td>53</td>
</tr>
<tr>
<td>30 mg QD</td>
<td>24-83*</td>
<td>86</td>
</tr>
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<td>40 mg QD</td>
<td>175-360</td>
<td>180</td>
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<tbody>
<tr>
<td>2.5 mg bid</td>
<td>53</td>
<td>8*</td>
</tr>
<tr>
<td>5 mg bid</td>
<td>86</td>
<td>11*</td>
</tr>
<tr>
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The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available in the laboratory manual for reference purposes only. Recommendations for rivaroxaban therapy and monitoring are available through the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

**ADMINISTRATIVE**

- **CPT Codes:**
  - 80299

- **LDT or Modified FDA:**
  - Yes

**COMPLETE VIEW**

- **Available Stat:**
  - No

- **Test Code:**
  - RVX

- **Performing Lab:**
  - Parnassus Hematology

- **Performed:**
  - Monday - Friday 0800-1600

- **Methodology:**
  - Chromogenic anti-Factor Xa

- **Remarks:**
  1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
  2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
  3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
  4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

- **Collect:**
  - Blue (2.7 mL) or Lt. Blue (1.8 mL) top filled to full extent of vacuum

- **Amount to Collect:**
  - 2.7 or 1.8 mL blood

- **Sample Type:**
  - Citrated plasma

- **Preferred Volume:**
  - 1 mL plasma

- **Minimum Volume:**
  - 0.5 mL plasma

- **Unacceptable Conditions:**
  - Samples collected in outdated blue top vacutainer.
  - Over-filled or under-filled tubes may be rejected

- **Specimen Preparation:**
  - Deliver immediately to Hematology for processing.

- **Units:**
  - ng/mL

- **Reference Interval:**
  - See additional information

- **Critical Values:**
  - >500 ng/mL

- **Synonyms:**
  - Xarelto
  - Monitoring Anticoagulation
  - Anti Factor 10a
Anti Factor Xa

**Stability (from collection to initiation):**
- Room temperature 4 hours

**Reported:**
- 1-3 days

**Additional Information:**
Although the manufacturer of rivaroxaban (Xarelto, Bayer Healthcare AG) does not recommend routine monitoring, the Einstein-DVT-Dose-Ranging Study (Blood 2008;112:2242-2247 has found the following typical drug levels in patients taking rivaroxaban:

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The appropriate therapeutic range will vary with the disease and the treatment intensity desired. An overview of recommendations is available in the laboratory manual for reference purposes only. Recommendations for rivaroxaban therapy and monitoring are available through the Hematology consultation services: for adults pager 443-4276, for pediatrics pager 443-6966.

**CPT Codes:**
- 80299

**LDT or Modified FDA:**
- Yes
RNA Polymerase III Antibody

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Enzyme Linked Immunosorbent Immunoassay (ELISA)
Reported: 3-7 days
Additional Information:
Autoantibodies to RNA Polymerase III antigen are found in 11% to 23% of patients with systemic sclerosis. Patients who are positive for RNA Polymerase III antibodies do not have any of the other antibodies typically found in systemic sclerosis patients such as anticientromere, anti-Scl-70, or anti-Pm/Scl antibodies. Thus, they are a separate serologic group. Numerous studies have shown that these patients have an increased risk of the diffuse cutaneous form of scleroderma, with high likelihood of skin involvement and hypertensive renal disease. Antibodies to several different types of RNA Polymerases are found in patients with systemic sclerosis. The immunodominant epitope on RNA Pol III was identified and cloned. The recombinant immunodominant epitope of RNA Pol III can be used in ELISA with high specificity to detect anti-RNA Pol III antibodies in patients with the diffuse cutaneous form of systemic sclerosis, with a high incidence of skin involvement.

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 1.0 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen 1 month.
Unacceptable Conditions: Gross hemolysis
Rejection Criteria: Gross hemolysis

PROCESSING

Test Code: RNAP
Sendout: Yes
Performing Lab: Quest
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.3 mL serum
Unacceptable Conditions:
Gross hemolysis

**Rejection Criteria:**
- Gross hemolysis

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen 1 month.

---

**RESULT INTERPRETATION**

**Units:**
- Units

**Reference Interval:**
- <20 Units

**Additional Information:**
Autoantibodies to RNA Polymerase III antigen are found in 11% to 23% of patients with systemic sclerosis. Patients who are positive for RNA Polymerase III antibodies do not have any of the other antibodies typically found in systemic sclerosis patients such as anti-centromere, anti-Scl-70, or anti-Pm/Scl antibodies. Thus, they are a separate serologic group. Numerous studies have shown that these patients have an increased risk of the diffuse cutaneous form of scleroderma, with high likelihood of skin involvement and hypertensive renal disease. Antibodies to several different types of RNA Polymerases are found in patients with systemic sclerosis. The immunodominant epitope on RNA Pol III was identified and cloned. The recombinant immunodominant epitope of RNA Pol III can be used in ELISA with high specificity to detect anti-RNA Pol III antibodies in patients with the diffuse cutaneous form of systemic sclerosis, with a high incidence of skin involvement.

---

**ADMINISTRATIVE**

**CPT Codes:**
- 83520-90

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- RNAP

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Enzyme Linked Immunosorbent Immunoassay (ELISA)

**Collect:**
- Red top or Gold top

**Amount to Collect:**
- 1.0 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 0.5 mL serum

**Minimum Volume:**
- 0.3 mL serum

**Rejection Criteria:**
- Gross hemolysis

**Unacceptable Conditions:**
- Gross hemolysis

**Units:**
- Units

**Reference Interval:**
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen 1 month.

Reported:
3-7 days

Additional Information:
Autoantibodies to RNA Polymerase III antigen are found in 11% to 23% of patients with systemic sclerosis. Patients who are positive for RNA Polymerase III antibodies do not have any of the other antibodies typically found in systemic sclerosis patients such as anti-centromere, anti-Scl-70, or anti-Pm/Scl antibodies. Thus, they are a separate serologic group. Numerous studies have shown that these patients have an increased risk of the diffuse cutaneous form of scleroderma, with high likelihood of skin involvement and hypertensive renal disease. Antibodies to several different types of RNA Polymerases are found in patients with systemic sclerosis. The immunodominant epitope on RNA Pol III was identified and cloned. The recombinant immunodominant epitope of RNA Pol III can be used in ELISA with high specificity to detect anti-RNA Pol III antibodies in patients with the diffuse cutaneous form of systemic sclerosis, with a high incidence of skin involvement.

CPT Codes:
83520-90
Rotavirus Antigen
P333

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Daily, day shift only
Methodology:
EIA
Reported:
Same or next day
Additional Information:
One of the commonest agents of gastroenteritis.

COLLECTION

Sample Type:
Fresh stool
Collect:
Urine cup
Amount to Collect:
2 gm
Preferred Volume:
2 gm
Minimum Volume:
1 gm
Stability (from collection to initiation):
Refrigerated 3 days
Unacceptable Conditions:
Formed stool. Stool in preservative. Repeat specimen within 1 week.

PROCESSING

Test Code:
P333
Performing Lab:
Microbiology
Specimen Preparation:
Refrigerate sample
Preferred Volume:
2 gm
Minimum Volume:
1 gm
Unacceptable Conditions:
Formed stool. Stool in preservative. Repeat specimen within 1 week.
Stability (from collection to initiation):
Refrigerated 3 days

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Reference Interval:
Negative

Additional Information:
One of the commonest agents of gastroenteritis.

**ADMINISTRATIVE**

CPT Codes:
- 87425

LOINC Codes:
- 5880-0

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- P333

Performing Lab:
- Microbiology

Performed:
- Daily, day shift only

Methodology:
- EIA

Collect:
  - Urine cup

Amount to Collect:
- 2 gm

Sample Type:
- Fresh stool

Preferred Volume:
- 2 gm

Minimum Volume:
- 1 gm

Unacceptable Conditions:
- Formed stool. Stool in preservative. Repeat specimen within 1 week.

Specimen Preparation:
- Refrigerate sample

Reference Interval:
- Negative

Stability (from collection to initiation):
- Refrigerated 3 days

Reported:
- Same or next day

Additional Information:
One of the commonest agents of gastroenteritis.

CPT Codes:
- 87425

LOINC Codes:
- 5880-0
RPR for Monitoring
RPRF

ORDERING

Performing Lab:
  Immunology

Performed:
  Weekdays (day shift)

Methodology:
  Agglutination

Reported:
  1-5 days

Additional Information:
  This test should only be ordered in known positive patients in whom the RPR titer is being followed to assess treatments. Positive results will be automatically reflex tested for titer.

To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/Reflex to Treponemal Ab.

Reflex Testing:
  Yes, if positive titer will be performed at an additional charge.

Synonyms:
  - Prenatal screening
  - congenital infection
  - prenatal infection
  - Syphilis
  - Treponema pallidum
  - TPAB

COLLECTION

Sample Type:
  Serum

Collect:
  Gold top

Amount to Collect:
  1 mL blood

Preferred Volume:
  0.5 mL serum

Stability (from collection to initiation):
  Refrigerated, 2 - 8 C: up to 7 days
  Frozen, -20 C or colder: 14 days

Storage/Transport Temperature:
  Refrigerated

PROCESSING

Test Code:
  RPRF

Test Group:
  Syphilis

Performing Lab:
  Immunology

Specimen Preparation:
Refrigerate sample

Preferred Volume:

0.5 mL serum

Stability (from collection to initiation):

Refrigerated, 2 - 8 C: up to 7 days
Frozen, -20 C or colder: 14 days

Storage/Transport Temperature:

Refrigerated

RESULT INTERPRETATION

Reference Interval:

Non-reactive

Additional Information:

This test should only be ordered in known positive patients in whom the RPR titer is being followed to assess treatments. Positive results will be automatically reflex tested for titer.

To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/Reflex to Treponemal Ab.

ADMINISTRATIVE

CPT Codes:

86592

COMPLETE VIEW

Test Code:

RPRF

Test Group:

Syphilis

Performing Lab:

Immunology

Performed:

Weekdays (day shift)

Methodology:

Agglutination

Collect:

Gold top

Amount to Collect:

1 mL blood

Sample Type:

Serum

Preferred Volume:

0.5 mL serum

Specimen Preparation:

Refrigerate sample

Reference Interval:

Non-reactive

Synonyms:

- Prenatal screening
- congenital infection
- prenatal infection
- Syphilis
- Treponema pallidum
• TPAB

Storage/Transport Temperature:
   Refrigerated

Stability (from collection to initiation):
   Refrigerated, 2 - 8 C: up to 7 days
   Frozen, -20 C or colder: 14 days

Reported:
   1-5 days

Reflex Testing:
   Yes, if positive titer will be performed at an additional charge.

Additional Information:
   This test should only be ordered in known positive patients in whom the RPR titer is being followed to assess treatments. Positive results will be automatically reflex tested for titer.

   To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/Reflex to Treponemal Ab.

CPT Codes:
   86592
Rubella Antibody, IgG

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days

Additional Information:
For occupational or early post-exposure screening, a single specimen is generally sufficient to determine immunity to rubella infection. An EQUIVOCAL result may not provide sufficient protection from clinical illness upon exposure to rubella virus.

When congenital infection is suspected, an initial negative result most likely excludes the diagnosis. If the result is positive in the initial specimen, a second sample should be submitted 3 months later to distinguish transplacentally-transmitted maternal antibody from congenital infection.

See also entry for Rubella Culture and table for Viral Serology. Acute cases of rubella should show a rise in antibody from an initially negative or equivocal level.

Synonyms:
- Prenatal screening
- TORCH Antibodies
- German measles

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum
Minimum Volume: 0.2 mL serum
Remarks: Avoid hemolysis
Unacceptable Conditions: Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code: RUBI
Performing Lab: Immunology
Specimen Preparation:
Freeze sample at -20°C

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed, lipemic or icteric samples

---

**RESULT INTERPRETATION**

**Units:**
Index

**Reference Interval:**
- Negative / Not-immune: < 0.90
- Equivocal: 0.90 - 0.99
- Positive / Immune: > 1.00

**Additional Information:**
For occupational or early post-exposure screening, a single specimen is generally sufficient to determine immunity to rubella infection. An EQUIVOCAL result may not provide sufficient protection from clinical illness upon exposure to rubella virus.

When congenital infection is suspected, an initial negative result most likely excludes the diagnosis. If the result is positive in the initial specimen, a second sample should be submitted 3 months later to distinguish transplacentally-transmitted maternal antibody from congenital infection.

See also entry for Rubella Culture and table for Viral Serology. Acute cases of rubella should show a rise in antibody from an initially negative or equivocal level.

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**ADMINISTRATIVE**

**CPT Codes:**
- 86762

**LOINC Codes:**
- 25514-1

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**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
RUBI

**Performing Lab:**
Immunology

**Performed:**
Monday-Friday (day shift)

**Methodology:**
Chemiluminescent Immunoassay

**Remarks:**
Avoid hemolysis

**Collect:**
Gold top

**Amount to Collect:**
1 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
0.5 mL serum
**Minimum Volume:**
0.2 mL serum

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric samples

**Specimen Preparation:**
- Freeze sample at -20C

**Units:**
- Index

**Reference Interval:**
- Negative / Not-immune: < 0.90
- Equivocal: 0.90 - 0.99
- Positive / Immune: > 1.00

**Synonyms:**
- Prenatal screening
- TORCH Antibodies
- German measles

**Reported:**
1-4 days

**Additional Information:**
For occupational or early post-exposure screening, a single specimen is generally sufficient to determine immunity to rubella infection. An EQUIVOCAL result may not provide sufficient protection from clinical illness upon exposure to rubella virus.

When congenital infection is suspected, an initial negative result most likely excludes the diagnosis. If the result is positive in the initial specimen, a second sample should be submitted 3 months later to distinguish transplacentally-transmitted maternal antibody from congenital infection.

See also entry for Rubella Culture and table for Viral Serology. Acute cases of rubella should show a rise in antibody from an initially negative or equivocal level.

**CPT Codes:**
- 86762

**LOINC Codes:**
- 25514-1
Rubella Culture
P319

ORDERING

Available Stat: No
Performing Lab: State Viral & Rickettsial Disease Laboratory
Methodology: Tissue culture
Synonyms:
  • Viral culture
  • German measles

COLLECTION

Sample Type:
  Amniotic fluid, nasal wash, random urine
Collect:
  Urine cup, clean container
Amount to Collect:
  See preferred volume
Preferred Volume:
  >= 20 mL fluid
Minimum Volume:
  1 mL fluid
Remarks:
  Performed only on infants with suspected congenital infection. Contact the Microbiology laboratory (x3-1268) to obtain consultation and arrange for sendout to the State Health Dept.

PROCESSING

Test Code: P319
Test Group: Viral culture
Sendout: Yes
Performing Lab: State Viral & Rickettsial Disease Laboratory
Preferred Volume:
  >= 20 mL fluid
Minimum Volume:
  1 mL fluid

ADMINISTRATIVE

LOINC Codes:
  29257-3

COMPLETE VIEW
Available Stat: No
Test Code: P319
Test Group: Viral culture
Performing Lab: State Viral & Rickettsial Disease Laboratory
Sendout: Yes
Methodology: Tissue culture
Remarks: Performed only on infants with suspected congenital infection. Contact the Microbiology laboratory (x3-1268) to obtain consultation and arrange for sendout to the State Health Dept.
Collect: Urine cup, clean container
Amount to Collect: See preferred volume
Sample Type: Amniotic fluid, nasal wash, random urine
Preferred Volume: >= 20 mL fluid
Minimum Volume: 1 mL fluid
Synonyms: Viral culture, German measles
LOINC Codes: 29257-3
Rubella PCR
P319

ORDERING

Approval Required:
Physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Available Stat:
No

Performing Lab:
State Viral & Rickettsia Disease Laboratory

Methodology:
Real time RT-PCR, molecular genotyping, viral culture

Synonyms:
- Viral culture
- German measles

COLLECTION

Sample Type:
Amniotic fluid, nasal wash, random urine, NPS or throat swab in UTM

Collect:
Urine cup, clean container, UTM

Preferred Volume:
>= 20 mL fluid

Remarks:
Collect respiratory specimen within 7-10 days of symptom onset.

10-50 mL urine should be collected within 10 days of rash onset. First part of urine stream is preferable.

PROCESSING

Test Code:
P319

Test Group:
Viral culture

Sendout:
Yes

Performing Lab:
State Viral & Rickettsia Disease Laboratory

Specimen Preparation:
Urine: Centrifuge at 500-600 g for 5-10 min. at 4C. Resuspend the pellet in 2-3 mL of UTM. Store and ship at -70C.

Preferred Volume:
>= 20 mL fluid

ADMINISTRATIVE

LOINC Codes:
29257-3

COMPLETE VIEW

Printed 06/07/19
Test information subject to change
Approval Required:

Physician must discuss the case and receive approval for submission of specimens from the SF Department of Public Health Communicable Disease Control Unit (415) 554-2830.

Physician must complete VIRAL & RICKETTSIAL DISEASE SPECIMEN SUBMITTAL FORM

Available Stat:

No

Test Code:

P319

Test Group:

Viral culture

Performing Lab:

State Viral & Rickettsial Disease Laboratory

Sendout:

Yes

Methodology:

Real time RT-PCR, molecular genotyping, viral culture

Remarks:

Collect respiratory specimen within 7-10 days of symptom onset.

10-50 mL urine should be collected within 10 days of rash onset. First part of urine stream is preferable.

Collect:

Urine cup, clean container, UTM

Sample Type:

Amniotic fluid, nasal wash, random urine, NPS or throat swab in UTM

Preferred Volume:

>= 20 mL fluid

Specimen Preparation:

Urine: Centrifuge at 500-600 g for 5-10 min. at 4C. Resuspend the pellet in 2-3 mL of UTM. Store and ship at -70C.

Synonyms:

Viral culture

German measles

LOINC Codes:

29257-3
Russell's Viper Venom Test
RVVTM

ORDERING

Ordering Recommendations:
When lupus anticoagulant testing is requested, it is appropriate to perform BOTH the RVVT and Lupus Anticoagulant by HEXA tests. For this reason, both will be performed whenever either is ordered. In the uncommon circumstance that a provider wishes to perform only one of these tests, the hematology laboratory should be contacted at 353-1747 to request that only the single test be performed.

Available Stat: 
No

Performing Lab:
Parnassus Hematology

Performed:
Test run once per week (Tuesday)

Reported:
2-9 days

Additional Information:
Summary of Interpretive Information for test results:

A RVVT test result <= 45.9 seconds is NEGATIVE for lupus anticoagulant according to international guidelines for interpretation.

A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this RVVT-based assay, the lupus anticoagulant by HEXA is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

For detection of lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent. Positives are automatically confirmed with an assay using a different reagent containing increased phospholipid content. An inhibitor screen is incorporated to exclude an abnormal result due to clotting factor deficiency.

Persistent presence (> 3 months) of antiphospholipid antibodies has been associated with recurrent thrombosis syndromes. A review of testing performed on UCSF patients indicates that, of all patients diagnosed with Lupus Anticoagulants, approximately 50% are detected in both Hexagonal Phospholipid Neutralization and Russell's Viper Venom tests, 25% in only the Hexagonal Phospholipid Neutralization Test, and 25% in only the Russell's Viper Venom Test.

Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results.

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

Synonyms:
- RVVT
- RVVTD
- LA
- Lupus anticoagulant
COLLECTION

Sample Type:
  Citrated plasma

Collect:
  Blue top x2 filled to full extent of vacuum

Amount to Collect:
  2.7 mL blood

Preferred Volume:
  1 mL plasma

Remarks:
  1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
  2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
  3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
  4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Stability (from collection to initiation):
  4 hours

Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Samples received over 4 hours from collection.

PROCESSING

Test Code:
  RVVTM

Performing Lab:
  Parnassus Hematology

Specimen Preparation:
  Within 4 hour of collection separate, centrifuge, and freeze 1.5 mL of plasma at -20C in a plastic tube.

  Note: If Lupus Anticoagulant ordered without further specification order both HEXA and RVVTM.

Preferred Volume:
  1 mL plasma

Unacceptable Conditions:
  Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Samples received over 4 hours from collection.

Stability (from collection to initiation):
  4 hours

RESULT INTERPRETATION

Units:
  Seconds, Ratio

Reference Interval:
  RVVT: 28.3 - 45.9 seconds
  RVVT Inhibitor Screen 33.4 - 43.4 seconds
  Phospholipid Confirmatory Ratio: 0.90 - 1.09

  See 'Additional Information' for interpretation of negative RVVT results.

Additional Information:
  Summary of Interpretive Information for test results:
A RVVT test result <= 45.9 seconds is NEGATIVE for lupus anticoagulant according to international guidelines for interpretation.

A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this RVVT-based assay, the lupus anticoagulant by HEXA is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

For detection of lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent. Positives are automatically confirmed with an assay using a different reagent containing increased phospholipid content. An inhibitor screen is incorporated to exclude an abnormal result due to clotting factor deficiency.

Persistent presence (> 3 months) of antiphospholipid antibodies has been associated with recurrent thrombosis syndromes. A review of testing performed on UCSF patients indicates that, of all patients diagnosed with Lupus Anticoagulants, approximately 50% are detected in both Hexagonal Phospholipid Neutralization and Russell's Viper Venom tests, 25% in only the Hexagonal Phospholipid Neutralization Test, and 25% in only the Russell's Viper Venom Test.

Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results.

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

**ADMINISTRATIVE**

**CPT Codes:**
- 85613

**LOINC Codes:**
- 6303-2

**COMPLETE VIEW**

**Available Stat:**
- No

**Ordering Recommendations:**
When lupus anticoagulant testing is requested, it is appropriate to perform BOTH the RVVT and Lupus Anticoagulant by HEXA tests. For this reason, both will be performed whenever either is ordered. In the uncommon circumstance that a provider wishes to perform only one of these tests, the hematology laboratory should be contacted at 353-1747 to request that only the single test be performed.

**Test Code:**
- RVVTM

**Performing Lab:**
- Parnassus Hematology

**Performed:**
- Test run once per week (Tuesday)

**Remarks:**
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
For patients with Hct's >= 55% please contact Hematology (x3-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
- Blue top x2 filled to full extent of vacuum

Amount to Collect:
- 2.7 mL blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 1 mL plasma

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected. Samples received over 4 hours from collection.

Specimen Preparation:
- Within 4 hour of collection separate, centrifuge, and freeze 1.5 mL of plasma at -20C in a plastic tube.

Note: If Lupus Anticoagulant ordered without further specification order both HEXA and RVVTM.

Units:
- Seconds, Ratio

Reference Interval:
- RVVT: 28.3 - 45.9 seconds
- RVVT Inhibitor Screen 33.4 - 43.4 seconds
- Phospholipid Confirmatory Ratio: 0.90 - 1.09

See 'Additional Information' for interpretation of negative RVVT results.

Synonyms:
- RVVT
- RVVTD
- LA
- Lupus anticoagulant

Stability (from collection to initiation):
- 4 hours

Reported:
- 2-9 days

Additional Information:

Summary of Interpretive Information for test results:

A RVVT test result <= 45.9 seconds is NEGATIVE for lupus anticoagulant according to international guidelines for interpretation.

A negative test result in this assay does not exclude the possibility of a lupus anticoagulant. Current guidelines suggest testing for lupus anticoagulant with two clot based tests (J Thromb Haemost 2009; 7: 1737-40): in addition to this RVVT-based assay, the lupus anticoagulant by HEXA is recommended for detecting lupus anticoagulants. Lupus anticoagulant testing should be considered positive if one of the two tests gives a positive result.

Testing for lupus anticoagulant in the presence of anticoagulant therapy (including warfarin, direct thrombin inhibitors & direct factor 10a inhibitors, and supratherapeutic heparin) is not recommended due to possible interference with test results. The presence of factor deficiencies or a factor specific inhibitor may also interfere with this assay. Clinical correlation is advised.

Test results must be interpreted in their clinical context if a diagnosis of antiphospholipid syndrome is being considered. J Thromb Haemost 2006; 4: 295-306 provides consensus guidelines for diagnosis of antiphospholipid syndrome.

For detection of lupus anticoagulants, which by definition prolong a clotting time, are inhibitors, and are phospholipid dependent. Positives are automatically confirmed with an assay using a different reagent containing increased phospholipid content. An inhibitor screen is incorporated to exclude an abnormal result due to clotting factor deficiency.

Persistent presence (> 3 months) of antiphospholipid antibodies has been associated with recurrent thrombosis syndromes. A review of testing performed on UCSF patients indicates that, of all patients diagnosed with Lupus Anticoagulants, approximately 50% are detected in both Hexagonal Phospholipid Neutralization and Russell's Viper Venom tests, 25% in only the Hexagonal Phospholipid
Neutralization Test, and 25% in only the Russell's Viper Venom Test.

Thrombin inhibitors (e.g. hirudin, argatroban, etc.) present in the sample to be tested may interfere in the test and lead to falsely positive results.

Rivaroxaban, apixaban, and similar agents can cause false positive results in assays used to identify LA. Evaluation for a lupus anticoagulant, therefore, cannot be accurately performed in the presence of rivaroxaban.

To monitor unfractionated heparin therapy in the presence of a lupus anticoagulant, Heparin Levels may be needed.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

CPT Codes:
- 85613

LOINC Codes:
- 6303-2
Saccharomyces cerevisiae Antibody
MOLT

ORDERING
Available Stat:
No
Performing Lab:
Quest
Additional Information:
The presence of IgG or IgA antibodies against the mannan antigen of S. cerevisiae in patients with gastrointestinal complaints is associated with a diagnosis of Crohn’s disease. Although the specificity is relatively high (90-95%), the test may also be positive in small number of patients with gluten sensitive enteropathy, primary biliary cirrhosis, and Behcet's disease.

The sensitivity of the test is low (45-60%), therefore a negative test does not rule out the diagnosis.

COLLECTION
Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

PROCESSING
Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum, send in plastic tube, order #10295N for IgA and/or #10294N for IgG
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum

RESULT INTERPRETATION
Additional Information:
The presence of IgG or IgA antibodies against the mannan antigen of S. cerevisiae in patients with gastrointestinal complaints is associated with a diagnosis of Crohn’s disease. Although the specificity is relatively high (90-95%), the test may also be positive in small number of patients with gluten sensitive enteropathy, primary biliary cirrhosis, and Behcet's disease.

The sensitivity of the test is low (45-60%), therefore a negative test does not rule out the diagnosis.

COMPLETE VIEW
Available Stat: No
Test Code: MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Performing Lab: Quest
Sendout: Yes
Collect: Gold top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Specimen Preparation: Refrigerate serum, send in plastic tube, order #10295N for IgA and/or #10294N for IgG
Additional Information: The presence of IgG or IgA antibodies against the mannan antigen of S. cerevisiae in patients with gastrointestinal complaints is associated with a diagnosis of Crohn’s disease. Although the specificity is relatively high (90-95%), the test may also be positive in small number of patients with gluten sensitive enteropathy, primary biliary cirrhosis, and Behcet's disease.

The sensitivity of the test is low (45-60%), therefore a negative test does not rule out the diagnosis.
Salicylate
SAL

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Timed-endpoint using salicylate hydroxylase (Beckman DxC800)
Reported: STAT 1 hour, Routine 1-3 days
Additional Information:
Note that the therapeutic range applies to use of aspirin for anti-inflammatory purposes. According to the UpToDate guidelines (accessed May 21, 2012) on “Salicylate poisoning in adults” by Barnett and Boyer, “Therapeutic serum salicylate concentrations fall between 10 to 30 mg/dL (0.7 to 2.2 mmol/L); values above 40 mg/dL are associated with toxicity. Although there is no absolute correlation between plasma salicylate concentration and symptoms, most patients show signs of intoxication when the plasma concentration exceeds 40 to 50 mg/dL. Plasma salicylate concentrations >100 mg/dL in acute intoxication and >60 mg/dL in chronic intoxication are indications for hemodialysis.”

Synonyms:
- ASA
- aspirin
- acetylsalicyclic acid

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.3 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen 1 week

PROCESSING

Test Code: SAL
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.3 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen 1 week
RESULT INTERPRETATION

Units: mg/dL
Reference Interval:
  Therapeutic: 10-30 mg/dL
Critical Values:
  >35 mg/dL
Additional Information:
  Note that the therapeutic range applies to use of aspirin for anti-inflammatory purposes. According to the UpToDate guidelines (accessed May 21, 2012) on "Salicylate poisoning in adults" by Barnett and Boyer, "Therapeutic serum salicylate concentrations fall between 10 to 30 mg/dL (0.7 to 2.2 mmol/L); values above 40 mg/dL are associated with toxicity. Although there is no absolute correlation between plasma salicylate concentration and symptoms, most patients show signs of intoxication when the plasma concentration exceeds 40 to 50 mg/dL. Plasma salicylate concentrations >100 mg/dL in acute intoxication and >60 mg/dL in chronic intoxication are indications for hemodialysis."

ADMINISTRATIVE

CPT Codes:
  80329
LOINC Codes:
  4024-6

COMPLETE VIEW

Available Stat: Yes
Test Code: SAL
Performing Lab: Parnassus & Mission Bay Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Timed-endpoint using salicylate hydroxylase (Beckman DxC800)
Collect:
  Gold top or Light Green top
Amount to Collect:
  1 mL blood
Sample Type:
  Serum or plasma
Preferred Volume:
  0.5 mL serum or plasma
Minimum Volume:
  0.3 mL serum or plasma
Units: mg/dL
Reference Interval:
  Therapeutic: 10-30 mg/dL
Critical Values:
  >35 mg/dL
Synonyms:
  - ASA
  - aspirin
• acetylsalicylic acid

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen 1 week

Reported:
  STAT 1 hour, Routine 1-3 days

Additional Information:
  Note that the therapeutic range applies to use of aspirin for anti-inflammatory purposes. According to the UpToDate guidelines (accessed May 21, 2012) on "Salicylate poisoning in adults" by Barnett and Boyer, "Therapeutic serum salicylate concentrations fall between 10 to 30 mg/dL (0.7 to 2.2 mmol/L); values above 40 mg/dL are associated with toxicity. Although there is no absolute correlation between plasma salicylate concentration and symptoms, most patients show signs of intoxication when the plasma concentration exceeds 40 to 50 mg/dL. Plasma salicylate concentrations >100 mg/dL in acute intoxication and >60 mg/dL in chronic intoxication are indications for hemodialysis."

CPT Codes:
  80329

LOINC Codes:
  4024-6
SC5b-9 Level (Terminal Complement Complex)
MOLT

ORDERING

Performing Lab:
National Jewish ADL

Performed:
1st Tuesday of the month

Methodology:
ELISA

Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

Synonyms:
- Soluble Membrane Attack Complex
- sMAC

COLLECTION

Sample Type:
Plasma

Collect:
Lavender top tube (EDTA)

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL plasma

Minimum Volume:
0.25 mL plasma

Stability (from collection to initiation):
1 year frozen

Storage/Transport Temperature:
Frozen

Unacceptable Conditions:
Thawed specimen

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
National Jewish ADL

Specimen Preparation:
Centrifuge at room temp within 30 minutes of collection. Aliquot and immediately freeze at -70C. This aliquot cannot be shared with other tests.

Preferred Volume:
1 mL plasma

Minimum Volume:
0.25 mL plasma

Unacceptable Conditions:
Thawed specimen

Printed 06/07/19
Test information subject to change
Stability (from collection to initiation):
1 year frozen

Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION

Units:
ng/mL

Reference Interval:
72-244 ng/mL

Additional Information:
A test requisition form must be completed and submitted with the sample. Click here for a copy of the form.

ADMINISTRATIVE

CPT Codes:
86160

COMPLETE VIEW

Test Code:
MOLT

Performing Lab:
National Jewish ADL

Sendout:
Yes

Performed:
1st Tuesday of the month

Methodology:
ELISA

Collect:
Lavender top tube (EDTA)

Amount to Collect:
2 mL blood

Sample Type:
Plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.25 mL plasma

Unacceptable Conditions:
Thawed specimen

Specimen Preparation:
Centrifuge at room temp within 30 minutes of collection. Aliquot and immediately freeze at -70C. This aliquot cannot be shared with other tests.

Units:
ng/mL

Reference Interval:
72-244 ng/mL

Synonyms:
- Soluble Membrane Attack Complex
- sMAC

Storage/Transport Temperature:
Frozen

**Stability (from collection to initiation):**

- 1 year frozen

**Additional Information:**

A test requisition form must be completed and submitted with the sample. Click [here](#) for a copy of the form.

**CPT Codes:**

86160
Schistosoma Antibodies
SCHISS

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
ELISA
Reported:
Set up once per week. Turnaround 7-14 days
Additional Information:
This assay will be run only if serial stool/urine examinations are negative.
See also Parasites-Rectal Biopsy,-Stool and-Urine.
Synonyms:
- Schistosomiasis
- Schistosoma mansoni
- Schistosoma haematobium
- Schistosoma japonicum
- Schistosoma mekongi

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.25 mL serum
Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 months, frozen at -20C indefinite.

PROCESSING

Test Code:
SCHISS
Test Group:
Schistosoma
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Refrigerate sample. Order Quest test # 53704P.
Preferred Volume:
1 mL serum
Minimum Volume:  
0.25 mL serum

Stability (from collection to initiation):  
Room temperature 2 weeks, refrigerated 2 months, frozen at -20C indefinite.

RESULT INTERPRETATION

Reference Interval:  
<1.00 = Antibody not detected

Additional Information:  
This assay will be run only if serial stool/urine examinations are negative.

See also Parasites-Rectal Biopsy,-Stool and-Urine.

ADMINISTRATIVE

CPT Codes:  
86682-90

LOINC Codes:  
6629-0

COMPLETE VIEW

Available Stat:  
No

Test Code:  
SCHISS

Test Group:  
Schistosoma

Performing Lab:  
Focus via Quest

Sendout:  
Yes

Methodology:  
ELISA

Collect:  
Red top (Gold top acceptable)

Amount to Collect:  
2 mL blood

Sample Type:  
Serum

Preferred Volume:  
1 mL serum

Minimum Volume:  
0.25 mL serum

Specimen Preparation:  
Refrigerate sample. Order Quest test # 53704P.

Reference Interval:  
<1.00 = Antibody not detected

Synonyms:  
- Schistosomiasis
- Schistosoma mansoni
- Schistosoma haematobium
- Schistosoma japonicum
Schistosoma mekongi

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 months, frozen at -20C indefinite.

Reported:
Set up once per week. Turnaround 7-14 days

Additional Information:
This assay will be run only if serial stool/urine examinations are negative.

See also Parasites-Rectal Biopsy,-Stool and-Urine.

CPT Codes:
86682-90

LOINC Codes:
6629-0
Schistosoma species  
P401, P412, P404  

ORDERING  

Available Stat:  
No  
Performing Lab:  
Microbiology  
Performed:  
Monday-Friday, day shift  
Methodology:  
Microscopy  
Reported:  
1-3 days  
Additional Information:  
If direct examination of urine is negative, a concentrate will be made for examination at an additional charge.  
Synonyms:  
- Schistosomiasis  
- Schistosoma mansoni  
- Schistosoma haematobium  
- Schistosoma japonicum  
- Schistosoma mekongi  

COLLECTION  

Sample Type:  
Stool, Unfixed tissue, Random urine  
Collect:  
- Stool: Urine cup, SAF fixative vial for outpatients  
- Urine: 24-hour urine container  
- Tissue: Urine cup or sterile tube  
SAF tubes and instructions available from the 1st floor ACC draw station, 2330 Post St draw station, 5th floor lab at Parnassus and 2nd floor lab at MtZ.  
Remarks:  
- **Schistosoma haematobium**, collect all urine voided between 10 am - 2 pm (peak egg excretion).  
For Schistosoma species other than S. haematobium, collect 3 stool samples 48 hours apart.  
Rectal or urinary bladder mucosal biopsy is suitable for detection of all species. Place tissue in saline-wetted gauze (do NOT soak tissue) and submit in a urine cup or tube.  
Deliver urine, unpreserved stool, and tissue to laboratory within one hour of collection.  
SAF tubes and instructions available from the 1st floor ACC draw station, 2330 Post St draw station, 5th floor lab at Parnassus and 2nd floor lab at MtZ.  

Stability (from collection to initiation):  
- Unpreserved stool: 1 hour  
- Stool in SAF: indefinite  
- Refrigerated urine and tissue: 2 days  

Unacceptable Conditions:  
- Improperly collected/submitted sample. Unpreserved stool > 1 hour old  

PROCESSING  

Printed 06/07/19  
Test information subject to change
Test Code:
- Stool: P401
- Urine: P412
- Tissue: P404

Test Group:
- Schistosoma

Performing Lab:
- Microbiology

Unacceptable Conditions:
- Improperly collected/submitted sample. Unpreserved stool > 1 hour old

Stability (from collection to initiation):
- Unpreserved stool: 1 hour
- Stool in SAF: indefinite
- Refrigerated urine and tissue: 2 days

RESULT INTERPRETATION

Reference Interval:
- Negative

Additional Information:
- If direct examination of urine is negative, a concentrate will be made for examination at an additional charge.

ADMINISTRATIVE

CPT Codes:
- Stool: 87177, 88313, 87206
- Tissue: 87169
- Urine: 87210

LOINC Codes:
- 10704-5

COMPLETE VIEW

Available Stat:
- No

Test Code:
- Stool: P401
- Urine: P412
- Tissue: P404

Test Group:
- Schistosoma

Performing Lab:
- Microbiology

Performed:
- Monday-Friday, day shift

Methodology:
- Microscopy

Remarks:
- **Schistosoma haematobium**, collect all urine voided between 10 am - 2 pm (peak egg excretion).

  For Schistosoma species other than S. haematobium, collect 3 stool samples 48 hours apart.

  Rectal or urinary bladder mucosal biopsy is suitable for detection of all species. Place tissue in saline-wetted gauze (do NOT soak tissue) and submit in a urine cup or tube.

  Deliver urine, unpreserved stool, and tissue to laboratory within one hour of collection.
SAF tubes and instructions available from the 1st floor ACC draw station, 2330 Post St draw station, 5th floor lab at Parnassus and 2nd floor lab at MtZ.

Collect:
- Stool: Urine cup, SAF fixative vial for outpatients
- Urine: 24-hour urine container
- Tissue: Urine cup or sterile tube

SAF tubes and instructions available from the 1st floor ACC draw station, 2330 Post St draw station, 5th floor lab at Parnassus and 2nd floor lab at MtZ.

Sample Type:
- Stool, Unfixed tissue, Random urine

Unacceptable Conditions:
- Improperly collected/submitted sample. Unpreserved stool > 1 hour old

Reference Interval:
- Negative

Synonyms:
- Schistosomiasis
- Schistosoma mansoni
- Schistosoma haematobium
- Schistosoma japonicum
- Schistosoma mekongi

Stability (from collection to initiation):
- Unpreserved stool: 1 hour
- Stool in SAF: indefinite
- Refrigerated urine and tissue: 2 days

Reported:
- 1-3 days

Additional Information:
- If direct examination of urine is negative, a concentrate will be made for examination at an additional charge.

CPT Codes:
- Stool: 87177, 88313, 87206
- Tissue: 87169
- Urine: 87210

LOINC Codes:
- 10704-5
SCL-70 Antibody
SCL70I

ORDERING

Performing Lab:
   Immunology
Performed:
   Friday, day shift
Methodology:
   Chemiluminescent
Reported:
   2-8 days
Additional Information:
   Clinical Use: Scleroderma may be localized or diffuse (Progressive Systemic Sclerosis PSS) that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. Scl-70 Antibody is present in approximately 40% of patients with PSS.
Synonyms:
   • Topoisomerase I antibodies
   • Scleroderma

COLLECTION

Sample Type:
   Serum
Collect:
   Gold top
Amount to Collect:
   2 mL blood
Preferred Volume:
   1 mL serum
Minimum Volume:
   0.5 mL serum
Stability (from collection to initiation):
   Serum in room temperature no longer than 48 hours; 2 - 8°C serum up to 10 days; -20°C or colder if longer than 10 days.
Storage/Transport Temperature:
   -20°C
Unacceptable Conditions:
   Grossly hemolyzed, icteric or lipemic serum should be avoided.

PROCESSING

Test Code:
   SCL70I
Performing Lab:
   Immunology
Specimen Preparation:
   Freeze sample at -20°C
Preferred Volume:
   1 mL serum
Minimum Volume:
   0.5 mL serum
Unacceptable Conditions:
   Grossly hemolyzed, icteric or lipemic serum should be avoided.
Stability (from collection to initiation):
  Serum in room temperature no longer than 48 hours; 2 - 8°C serum up to 10 days; -20°C or colder if longer than 10 days.

Storage/Transport Temperature:
  -20°C

RESULT INTERPRETATION

Units:
  CU

Reference Interval:
  Negative: <20 CU
  Positive: >=20 CU

Additional Information:
  Clinical Use: Scleroderma may be localized or diffuse (Progressive Systemic Sclerosis PSS) that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. Scl-70 Antibody is present in approximately 40% of patients with PSS.

ADMINISTRATIVE

CPT Codes:
  86235

LOINC Codes:
  27416-7

COMPLETE VIEW

Test Code:
  SCL70I

Performing Lab:
  Immunology

Performed:
  Friday, day shift

Methodology:
  Chemiluminescent

Collect:
  Gold top

Amount to Collect:
  2 mL blood

Sample Type:
  Serum

Preferred Volume:
  1 mL serum

Minimum Volume:
  0.5 mL serum

Unacceptable Conditions:
  Grossly hemolyzed, icteric or lipemic serum should be avoided.

Specimen Preparation:
  Freeze sample at -20°C

Units:
  CU

Reference Interval:
  Negative: <20 CU
  Positive: >=20 CU

Synonyms:
  - Topoisomerase I antibodies
  - Scleroderma
Storage/Transport Temperature:
  -20°C

Stability (from collection to initiation):
  Serum in room temperature no longer than 48 hours; 2 - 8°C serum up to 10 days; -20°C or colder if longer than 10 days.

Reported:
  2-8 days

Additional Information:
  Clinical Use: Scleroderma may be localized or diffuse (Progressive Systemic Sclerosis PSS) that may involve skin, gastrointestinal tracts, lungs, vascular and cardiac systems, and kidneys. Scl-70 Antibody is present in approximately 40% of patients with PSS.

CPT Codes:
  86235

LOINC Codes:
  27416-7
Second Trimester Screen
STS

ORDERING

Available Stat:

No

Performing Lab:

Western Clinical Laboratories, Inc.

Reported:

10 days from time of receipt at Western Clinical laboratories

Additional Information:

For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.

Synonyms:

- Triple screen
- Obstetrical screen
- Down's syndrome screen
- Neural tube defect screen
- Alpha-fetoprotein
- alpha-fetoglobulin
- AFP3
- E3
- Expanded AFP screening
- Maternal serum screen
- MSS3
- Maternal tests
- Prenatal screening

COLLECTION

Patient Preparation:

Have the patient read the Program booklet and sign the consent form. The consent is to remain with the clinic.

Sample Type:

Serum is used for testing but the entire unopened tube must be sent.

Collect:

Special SST supplied in Prenatal Screening test kit.

Amount to Collect:

3.5 mL blood

Preferred Volume:

3.5 mL blood (1.5 mL serum)

Minimum Volume:

3.5 mL blood (1.5 mL serum)

Remarks:

Prior to collection:
Send the remainder of the Program form with the patient to have the sample collected between 15 weeks to 20 weeks of pregnancy (Second Trimester). Include a completed Routine Laboratory requisition listing 'Second Trimester Screen' in the lower right corner of the form.

To allow correct billing, provide Medi-Cal information, if applicable. Otherwise, enclose a copy of insurance card.

At the time of collection: Complete Part B (green) at the bottom of form.
Draw the patient's blood using the 3.5 mL serum separator tube supplied in the program kit.

Apply the white collection label from the top of this page to the tube with the patient's name and collection date.

**Rejection Criteria:**

1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolyzed
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1/2 hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF
11. Patient last name or TRF number is absent from either tube or TRF
12. Different middle initials on tube vs TRF

**PROCESSING**

**Test Code:**
- STS

**Test Group:**
- Prenatal screening

**Sendout:**
- Yes

**Performing Lab:**
- Western Clinical Laboratories, Inc.

**Specimen Preparation:**

Let whole blood stand for 1/2 hour to 1 hour after time of collection before centrifuging to aid clot formation. Centrifuge tube and place the centrifuged tube in the blue plastic tray. Place plastic tray in the absorbent pouch. Seal the pouch.

Place the white copy of the completed form, the insurance information in the red mailing box.

Remove the Business Reply label from the top of the form and place it on the red box, mail the same day, if possible.

If specimen is sent by courier, follow the courier's instructions for packaging.

**Preferred Volume:**
- 3.5 mL blood (1.5 mL serum)

**Minimum Volume:**
- 3.5 mL blood (1.5 mL serum)

**Rejection Criteria:**

1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolyzed
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1/2 hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF
11. Patient last name or TRF number is absent from either tube or TRF
12. Different middle initials on tube vs TRF

**RESULT INTERPRETATION**
Additional Information:
For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.

ADMINISTRATIVE

CPT Codes:
The Prenatal Screening Billing Code is assigned by the Program upon request.

COMPLETE VIEW

Available Stat:
No

Test Code:
STS

Test Group:
Prenatal screening

Performing Lab:
Western Clinical Laboratories, Inc.

Sendout:
Yes

Patient Preparation:
Have the patient read the Program booklet and sign the consent form. The consent is to remain with the clinic.

Remarks:
Prior to collection:
Send the remainder of the Program form with the patient to have the sample collected between 15 weeks to 20 weeks of pregnancy (Second Trimester). Include a completed Routine Laboratory requisition listing 'Second Trimester Screen' in the lower right corner of the form.

To allow correct billing, provide Medi-Cal information, if applicable. Otherwise, enclose a copy of insurance card.

At the time of collection: Complete Part B (green) at the bottom of form.

Draw the patient's blood using the 3.5 mL serum separator tube supplied in the program kit.

Apply the white collection label from the top of this page to the tube with the patient's name and collection date.

Collect:
Special SST supplied in Prenatal Screening test kit.

Amount to Collect:
3.5 mL blood

Sample Type:
Serum is used for testing but the entire unopened tube must be sent.

Preferred Volume:
3.5 mL blood (1.5 mL serum)

Minimum Volume:
3.5 mL blood (1.5 mL serum)

Rejection Criteria:
1. No information on tube or in package containing the tube
2. Specimen arrives with no test request form (TRF)
3. Tube arrives damaged or broken
4. Quantity of serum is insufficient for analysis
5. Specimen arrives hemolyzed
6. Specimen arrives over 30 days (1st trimester) or 10 days (2nd trimester) after blood collection date (1st trimester)
7. EDTA contamination in tube
8. 1st trimester specimen is not properly centrifuged
   - Let whole blood stand 1/h hr to 1 hr before centrifuging to aid clot formation.
   - Centrifuge at 1000 x g for minimum of 10 minutes.
9. TRF number on TRF does not match TRF number on tube
10. Patient last name on tube does not match spelling of patient last name on TRF

Printed 06/07/19
Test information subject to change
11. Patient last name or TRF number is absent from either tube or TRF
12. Different middle initials on tube vs TRF

**Specimen Preparation:**

Let whole blood stand for 1/2 hour to 1 hour after time of collection before centrifuging to aid clot formation. Centrifuge tube and place the centrifuged tube in the blue plastic tray. Place plastic tray in the absorbent pouch. Seal the pouch.

Place the white copy of the completed form, the insurance information in the red mailing box.

Remove the Business Reply label from the top of the form and place it on the red box, mail the same day, if possible.

If specimen is sent by courier, follow the courier's instructions for packaging.

**Synonyms:**

- Triple screen
- Obstetrical screen
- Down's syndrome screen
- Neural tube defect screen
- Alpha-fetoprotein
- alpha-fetoglobulin
- AFP3
- E3
- Expanded AFP screening
- Maternal serum screen
- MSS3
- Maternal tests
- Prenatal screening

**Reported:**

10 days from time of receipt at Western Clinical laboratories

**Additional Information:**

For questions, call the California Prenatal Screening Program at (866) 718-7915 Toll Free.

**CPT Codes:**

The Prenatal Screening Billing Code is assigned by the Program upon request.
Sedimentation Rate
ESR

ORDERING

Available Stat: Yes
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Performed: Test available 24 hours per day 7 days per week
Methodology: Parnassus: Westergren
Mission Bay: Roller 20PN
Reported: STAT 1 hour, Routine 4 hours
Additional Information: The erythrocyte sedimentation rate increases with age; the upper limit is not clearly defined for patients > 60 years old.
Synonyms: Sed rate, ESR, Erythrocyte sedimentation rate

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 2 mL blood
Preferred Volume: 2 mL blood
Stability (from collection to initiation): Sample stable for 12 hours at 4C, for only 5 hours at room temperature.
Unacceptable Conditions: >5 hrs at room temperature, >12 hrs at 4ºC

PROCESSING

Test Code: ESR
Performing Lab: Parnassus, Mission Bay & Mt. Zion Hematology
Preferred Volume: 2 mL blood
Unacceptable Conditions: >5 hrs at room temperature, >12 hrs at 4ºC
Stability (from collection to initiation): Sample stable for 12 hours at 4C, for only 5 hours at room temperature.

RESULT INTERPRETATION
Units:

mm/h

Reference Interval:

Parnassus:
Male 0-10 mm/h
Female 0-15 mm/h

Mission Bay:
Age (yrs) Male Female
0-14 2-34 mm/h 2-34 mm/h
15-50 2-28 mm/h 2-37 mm/h
51-70 2-37 mm/h 2-39 mm/h
>70 3-46 mm/h 3-46 mm/h

Additional Information:

The erythrocyte sedimentation rate increases with age; the upper limit is not clearly defined for patients > 60 years old.

ADMINISTRATIVE

CPT Codes:

85651

LOINC Codes:

4537-7

COMPLETE VIEW

Available Stat:

Yes

Test Code:

ESR

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Hematology

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Parnassus: Westergren
Mission Bay: Roller 20PN

Collect:

Lavender top

Amount to Collect:

2 mL blood

Sample Type:

EDTA whole blood

Preferred Volume:

2 mL blood

Unacceptable Conditions:

>5 hrs at room temperature, >12 hrs at 4ºC

Units:

mm/h

Reference Interval:

Parnassus:
Male 0-10 mm/h
Female 0-15 mm/h

Mission Bay:
Age (yrs) Male Female
0-14  2-34 mm/h 2-34 mm/h
15-50  2-28 mm/h 2-37 mm/h
51-70  2-37 mm/h 2-39 mm/h
>70    3-46 mm/h 3-46 mm/h

Synonyms:
- Sed rate
- ESR
- Erythrocyte sedimentation rate

Stability (from collection to initiation):
Sample stable for 12 hours at 4C, for only 5 hours at room temperature.

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
The erythrocyte sedimentation rate increases with age; the upper limit is not clearly defined for patients > 60 years old.

CPT Codes:
- 85651

LOINC Codes:
- 4537-7
Selenium, plasma
SE

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Atomic Absorption Spectroscopy
Reported:
Test performed Tuesday and Friday. Turnaround time: 2-4 days.
Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.0127.

Selenium is an essential trace element, and is commonly used in industry such as semiconductors, ceramics, glass, and rubber. It is important to monitor its level for health and for avoiding selenosis, especially when it is used as an element of parenteral nutrition. Concentrations are also monitored in children with propionic acidemia who require special diets with supplements.

COLLECTION

Patient Preparation:
Patient should refrain from taking vitamins or mineral supplements at least three days prior to specimen collection.
Sample Type:
EDTA plasma
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL plasma
Minimum Volume:
0.7 mL plasma
Remarks:
Be sure to gently mix the specimen promptly after phlebotomy.
Stability (from collection to initiation):
Room temperature: 8 hours
Refrigerated: 14 days
Frozen: 1 month
Rejection Criteria:
Hemolyzed specimen

PROCESSING

Test Code:
SE
Test Group:
Selenium
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge the Navy Blue-EDTA tube within 1 hour of collection and pour off the plasma into a plastic trace element shipping container.
supplied by reference laboratory. Freeze plasma at -20C. Ship frozen. Order Quest # 5507

Preferred Volume:
2 mL plasma

Minimum Volume:
0.7 mL plasma

Rejection Criteria:
Hemolyzed specimen

Stability (from collection to initiation):
Room temperature: 8 hours
Refrigerated: 14 days
Frozen: 1 month

RESULT INTERPRETATION

Units:
µg/L (mcg/L)

Reference Interval:
<2 years 16-71 µg/L
2-3 years 40-103 µg/L
4-16 years 55-134 µg/L
> 16 years 63-160 µg/L

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.0127.

Selenium is an essential trace element, and is commonly used in industry such as semiconductors, ceramics, glass, and rubber. It is important to monitor its level for health and for avoiding selenosis, especially when it is used as an element of parenteral nutrition. Concentrations are also monitored in children with propionic acidemia who require special diets with supplements.

ADMINISTRATIVE

CPT Codes:
84255-90
LOINC Codes:
5724-0

COMPLETE VIEW

Available Stat:
No

Test Code:
SE

Test Group:
Selenium

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Atomic Absorption Spectroscopy

Patient Preparation:
Patient should refrain from taking vitamins or mineral supplements at least three days prior to specimen collection.

Remarks:
Be sure to gently mix the specimen promptly after phlebotomy.

Collect:
Navy blue top (EDTA) tube
Amount to Collect:  
4 mL blood

Sample Type:  
EDTA plasma

Preferred Volume:  
2 mL plasma

Minimum Volume:  
0.7 mL plasma

Rejection Criteria:  
Hemolyzed specimen

Specimen Preparation:  
Centrifuge the Navy Blue-EDTA tube within 1 hour of collection and pour off the plasma into a plastic trace element shipping container supplied by reference laboratory. Freeze plasma at -20C. Ship frozen. Order Quest # 5507

Units:  
µg/L (mcg/L)

Reference Interval:  
<2 years  16-71 µg/L  
2-3 years  40-103 µg/L  
4-16 years  55-134 µg/L  
> 16 years  63-160 µg/L

Stability (from collection to initiation):  
Room temperature: 8 hours  
Refrigerated: 14 days  
Frozen: 1 month

Reported:  
Test performed Tuesday and Friday. Turnaround time: 2-4 days.

Additional Information:  
To convert µg/L to µmol/L (SI units) multiply by 0.0127.

Selenium is an essential trace element, and is commonly used in industry such as semiconductors, ceramics, glass, and rubber. It is important to monitor its level for health and for avoiding selenosis, especially when it is used as an element of parenteral nutrition. Concentrations are also monitored in children with propionic acidemia who require special diets with supplements.

CPT Codes:  
84255-90

LOINC Codes:  
5724-0
Selenium, urine
SELRU

ORDERING

Available Stat:
No
Performing Lab:
National Medical Services via Quest
Methodology:
Graphite furnace atomic absorption spectrophotometry (GFAAS)
Reported:
Performed at NMS Tuesday & Saturday. Turnaround 7-14 days
Additional Information:
Concentrations are diet dependent.
Creatinine is also run and reported on the sample
Synonyms:
• Se

COLLECTION

Sample Type:
Random urine
Collect:
Acid washed (trace metal free) container or urine cup
Amount to Collect:
15 mL urine
Preferred Volume:
5 mL urine
Minimum Volume:
3 mL urine
Remarks:
Clean catch urine
Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 weeks.
Rejection Criteria:
Frozen sample received

PROCESSING

Test Code:
SELRU
Test Group:
Selenium
Sendout:
Yes
Performing Lab:
National Medical Services via Quest
Specimen Preparation:
Aliquot urine in acid washed (trace metal free) container and refrigerate. DO NOT freeze.
Ship sample refrigerated to Quest, order test # 8829X. If patient is B/T, order LabCorp test # 071613.
Preferred Volume:
5 mL urine

Minimum Volume:
3 mL urine

Rejection Criteria:
Frozen sample received

Stability (from collection to initiation):
Room temperature 2 weeks, refrigerated 2 weeks.

RESULT INTERPRETATION

Units:
µg/L (µg/g Creatinine)

Reference Interval:
Selenium: <= 200 µg/L
Corrected for Creatinine: < 25 µg/g Creatinine

Additional Information:
Concentrations are diet dependent.
Creatinine is also run and reported on the sample

ADMINISTRATIVE

CPT Codes:
84255-90, 82570-90

LOINC Codes:
5726-5

COMPLETE VIEW

Available Stat:
No

Test Code:
SELRU

Test Group:
Selenium

Performing Lab:
National Medical Services via Quest

Sendout:
Yes

Methodology:
Graphite furnace atomic absorption spectrophotometry (GFAAS)

Remarks:
Clean catch urine

Collect:
Acid washed (trace metal free) container or urine cup

Amount to Collect:
15 mL urine

Sample Type:
Random urine

Preferred Volume:
5 mL urine

Minimum Volume:
3 mL urine

Rejection Criteria:
Frozen sample received
Specimen Preparation:
Aliquot urine in acid washed (trace metal free) container and refrigerate. DO NOT freeze.

Ship sample refrigerated to Quest, order test # 8829X. If patient is B/T, order LabCorp test # 071613.

Units:
\( \mu g/L \) (\( \mu g/g \) Creatinine)

Reference Interval:
- Selenium: \( \leq 200 \mu g/L \)
- Corrected for Creatinine: < 25 \( \mu g/g \) Creatinine

Synonyms:
- Se

Stability (from collection to initiation):
- Room temperature 2 weeks, refrigerated 2 weeks.

Reported:
- Performed at NMS Tuesday & Saturday. Turnaround 7-14 days

Additional Information:
- Concentrations are diet dependent.
- Creatinine is also run and reported on the sample

CPT Codes:
- 84255-90, 82570-90

LOINC Codes:
- 5726-5
# Semen Analysis

**SEMN**

## ORDERING

**Performing Lab:**

This testing is no longer offered through the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

## PROCESSING

**Performing Lab:**

This testing is no longer offered through the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

## COMPLETE VIEW

**Performing Lab:**

This testing is no longer offered through the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).
Serotonin
SERO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test run Monday-Saturday. Turnaround time: 2-5 days.
Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.00568.

For testing on urine see 5-HIAA.

COLLECTION

Patient Preparation:
The patient should avoid foods high in indoles for 3 days prior to specimen collection: avocado, banana, eggplant, pineapple, plum, tomato and walnut, as well as avoiding coffee, tea and tobacco.
Sample Type:
Blood
Collect:
Obtain special collection kit from specimen receiving desk (M521).
Amount to Collect:
4 mL blood
Preferred Volume:
4 mL blood
Minimum Volume:
1.1 mL blood
Remarks:
Obtain special collection kit from Specimen Receiving Desk (M521). The specimen collection kit will include a lavender top tube and a special plastic vial containing ascorbic acid. After drawing the specimen into the lavender top tube, mix well and deliver to laboratory asap.

PROCESSING

Test Code:
SERO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Transfer whole blood into the plastic vial, mix well and freeze at -20C. Do NOT centrifuge. Order Quest # 29397P.
Preferred Volume:
4 mL blood
Minimum Volume:
1.1 mL blood

RESULT INTERPRETATION

Test information subject to change
Units:
µg/L (µg/L)

Reference Interval:
>= 18 year old: 55-260 µg/L

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.00568.

For testing on urine see 5-HIAA.

ADMINISTRATIVE

CPT Codes:
84260-90

LOINC Codes:
2939-7

COMPLETE VIEW

Available Stat:
No

Test Code:
SERO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
The patient should avoid foods high in indoles for 3 days prior to specimen collection: avocado, banana, eggplant, pineapple, plum, tomato and walnut, as well as avoiding coffee, tea and tobacco.

Remarks:
Obtain special collection kit from Specimen Receiving Desk (M521). The specimen collection kit will include a lavender top tube and a special plastic vial containing ascorbic acid. After drawing the specimen into the lavender top tube, mix well and deliver to laboratory asap.

Collect:
Obtain special collection kit from specimen receiving desk (M521).

Amount to Collect:
4 mL blood

Sample Type:
Blood

Preferred Volume:
4 mL blood

Minimum Volume:
1.1 mL blood

Specimen Preparation:
Transfer whole blood into the plastic vial, mix well and freeze at -20C. Do NOT centrifuge. Order Quest # 29397P.

Units:
µg/L (µg/L)

Reference Interval:
>= 18 year old: 55-260 µg/L

Reported:
Test run Monday-Saturday. Turnaround time: 2-5 days.

Additional Information:
To convert µg/L to µmol/L (SI units) multiply by 0.00568.

For testing on urine see 5-HIAA.

**CPT Codes:**
84260-90

**LOINC Codes:**
2939-7
Serum Preparation & Storage
HTSPS (Sunquest: ILSPS)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Synonyms:
• Serum for Waitlist, Save Transplant Serum

COLLECTION

Sample Type:
Serum
Collect:
Red top x 2
Amount to Collect:
12 mL blood
Preferred Volume:
6 mL serum
Minimum Volume:
2 mL serum
Remarks:
Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample

PROCESSING

Test Code:
HTSPS (Sunquest: ILSPS)
Test Group:
HLA Sample
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
6 mL serum
Minimum Volume:
2 mL serum
Unacceptable Conditions:
Hemolyzed sample
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  HTSPS (Sunquest: ILSPS)
Test Group:
  HLA Sample
Performing Lab:
  Immunogenetics & Transplantation Laboratory (ITL)
Sendout:
  Yes
Remarks:
  Fill Red top tube completely. If being collected with other antibody and or crossmatch testing, collect 2 tubes.
Collect:
  Red top x 2
Amount to Collect:
  12 mL blood
Sample Type:
  Serum
Preferred Volume:
  6 mL serum
Minimum Volume:
  2 mL serum
Unacceptable Conditions:
  Hemolyzed sample
Specimen Preparation:
  Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Synonyms:
  • Serum for Waitlist, Save Transplant Serum
Stability (from collection to initiation):
  If kept at ambient temperature, can be good for up to 72 hours
CPT Codes:
  N/A
## Serum Viscosity

**VISCO**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday (day shift)

**Reported:**
- 1-3 days

**Additional Information:**
- A full 5 mL of serum is required for the instrument used; Serum viscosity is measured relative to water at 37C.

- This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top x4

**Amount to Collect:**
- 20 mL blood

**Preferred Volume:**
- 10 mL serum

**Minimum Volume:**
- 5 mL serum

**Remarks:**
- If serum is extremely viscous it may be difficult to collect using vacutainers. Use of a syringe and 18 gauge needle may be required.

**Stability (from collection to initiation):**
- Refrigerated 4 days

### PROCESSING

**Test Code:**
- VISCO

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Refrigerate sample

**Preferred Volume:**
- 10 mL serum

**Minimum Volume:**
- 5 mL serum

**Stability (from collection to initiation):**
- Refrigerated 4 days

### RESULT INTERPRETATION

**Reference Interval:**

Printed 06/07/19
Test information subject to change
1.4-1.8

Additional Information:
A full 5 mL of serum is required for the instrument used; Serum viscosity is measured relative to water at 37C.

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Codes:
85810

LDT or Modified FDA:
Yes

LOINC Codes:
41241-1

Available Stat:
No

Test Code:
VISCO

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Remarks:
If serum is extremely viscous it may be difficult to collect using vacutainers. Use of a syringe and 18 gauge needle may be required.

Collect:
Gold top x4

Amount to Collect:
20 mL blood

Sample Type:
Serum

Preferred Volume:
10 mL serum

Minimum Volume:
5 mL serum

Specimen Preparation:
Refrigerate sample

Reference Interval:
1.4-1.8

Stability (from collection to initiation):
Refrigerated 4 days

Reported:
1-3 days

CPT Codes:
85810

LDT or Modified FDA:
Yes
LOINC Codes:
41241-1
Severe Acute Respiratory Syndrome
P319

ORDERING

Available Stat: No
Performing Lab: State Viral & Rickettsial Disease Laboratory
Additional Information:
Laboratory testing is performed at the State of California DHS Viral and Rickettsial Disease Laboratory, and at the Centers for Disease Control, on hospitalized patients with unexplained pneumonia AND, for SARS, with travel to Guangdong Province, China.

Testing is performed for a broad range of pathogens, including Coronavirus, other respiratory viruses, human metapneumovirus, Mycoplasma, and Chlamydia.

Specimens should be kept refrigerated until delivered to the Microbiology laboratory.

Synonyms:
• SARS

COLLECTION

Sample Type:
Nasopharyngeal swab or wash, Serum, Stool or rectal swab, BAL, tracheal aspirate, pleural fluid.
Collect:
Swabs in viral transport media, Gold top, stool in urine cup, fluid in Red top or other sterile container.

Amount to Collect:
Blood: 10 mL
Stool: 50 mL

Preferred Volume:
5 mL serum AND 50 mL stool

Minimum Volume:
2.5 mL serum AND 10 mL stool

Remarks:
Before submitting specimens for SARS testing, clinicians who suspect cases of SARS are requested to report such cases to UCSF Infection Control at 476-5793 and San Francisco Communicable Disease Control Unit at (415)554-2830.

Contact UCSF Microbiology Laboratory (3-1268) to obtain the Unexplained Pneumonia Screening form for specimen submission, and to facilitate transport of specimens to San Francisco DPH Laboratory.

Both upper respiratory (nasopharyngeal swab or wash) and blood are required samples. Stool and lower respiratory samples may also be submitted but are not required.

PROCESSING

Test Code: P319
Sendout: Yes
Performing Lab: State Viral & Rickettsial Disease Laboratory
Specimen Preparation:
Refrigerate sample
Preferred Volume:
5 mL serum AND 50 mL stool
Minimum Volume:
RESULT INTERPRETATION

Additional Information:
Laboratory testing is performed at the State of California DHS Viral and Rickettsial Disease Laboratory, and at the Centers for Disease Control, on hospitalized patients with unexplained pneumonia AND, for SARS, with travel to Guangdong Province, China.

Testing is performed for a broad range of pathogens, including Coronavirus, other respiratory viruses, human metapneumovirus, Mycoplasma, and Chlamydia.

Specimens should be kept refrigerated until delivered to the Microbiology laboratory.

ADMINISTRATIVE

LOINC Codes:
29257-3

COMPLETE VIEW

Available Stat:
No
Test Code:
P319
Performing Lab:
State Viral & Rickettsial Disease Laboratory
Sendout:
Yes
Remarks:
Before submitting specimens for SARS testing, clinicians who suspect cases of SARS are requested to report such cases to UCSF Infection Control at 476-5793 and San Francisco Communicable Disease Control Unit at (415)554-2830.

Contact UCSF Microbiology Laboratory (3-1268) to obtain the Unexplained Pneumonia Screening form for specimen submission, and to facilitate transport of specimens to San Francisco DPH Laboratory.

Both upper respiratory (nasopharyngeal swab or wash) and blood are required samples. Stool and lower respiratory samples may also be submitted but are not required.

Collect:
Swabs in viral transport media, Gold top, stool in urine cup, fluid in Red top or other sterile container.

Amount to Collect:
Blood: 10 mL
Stool: 50 mL

Sample Type:
Nasopharyngeal swab or wash, Serum, Stool or rectal swab, BAL, trachael aspirate, pleural fluid.

Preferred Volume:
5 mL serum AND 50 mL stool

Minimum Volume:
2.5 mL serum AND 10 mL stool

Specimen Preparation:
Refrigerate sample

Synonyms:
- SARS

Additional Information:
Laboratory testing is performed at the State of California DHS Viral and Rickettsial Disease Laboratory, and at the Centers for Disease Control, on hospitalized patients with unexplained pneumonia AND, for SARS, with travel to Guangdong Province, China.

Testing is performed for a broad range of pathogens, including Coronavirus, other respiratory viruses, human metapneumovirus,
Mycoplasma, and Chlamydia.

Specimens should be kept refrigerated until delivered to the Microbiology laboratory.

**LOINC Codes:**

29257-3
Sex Hormone-Binding Globulin
SHBG

ORDERING

Available Stat:
No
Performing Lab:
Esoterix
Performed:
Monday-Friday
Methodology:
Electrochemiluminescence Immunoassay (ECLIA)
Reported:
1-3 days

COLLECTION

Sample Type:
Serum (plasma not acceptable)
Collect:
Gold or red top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum (would not allow repeat testing)
Unacceptable Conditions:
Plasma sample received

PROCESSING

Test Code:
SHBG
Sendout:
Yes
Performing Lab:
Esoterix
Specimen Preparation:
Process immediately. Freeze serum in plastic vial at -20C. Order Esoterix test # 500299.
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum (would not allow repeat testing)
Unacceptable Conditions:
Plasma sample received

RESULT INTERPRETATION

Units:
nmol/L
Reference Interval:
1 mo-23 mo 60-252 nmol/L  
Prepubertal 72-220 nmol/L  
Pubertal males 16-100 nmol/L  
Pubertal females 36-125 nmol/L  
20-49 year old males 16.5-55.9 nmol/L  
>49 year old males 19.3-76.4 nmol/L  
20-49 year old females 24.6-122 nmol/L  
>49 year old females 17.3-76.4 nmol/L

**ADMINISTRATIVE**

CPT Codes:  
84270-90  
LOINC Codes:  
13967-5

**COMPLETE VIEW**

Available Stat:  
No  
Test Code:  
SHBG  
Performing Lab:  
Esoterix  
Sendout:  
Yes  
Performed:  
Monday-Friday  
Methodology:  
Electrochemiluminescence Immunoassay (ECLIA)  
Collect:  
Gold or red top  
Amount to Collect:  
1 mL blood  
Sample Type:  
Serum (plasma not acceptable)  
Preferred Volume:  
0.5 mL serum  
Minimum Volume:  
0.3 mL serum (would not allow repeat testing)  
Unacceptable Conditions:  
Plasma sample received  
Specimen Preparation:  
Process immediately. Freeze serum in plastic vial at -20C. Order Esoterix test # 500299.  
Units:  
nmol/L  
Reference Interval:  
1 mo-23 mo 60-252 nmol/L  
Prepubertal 72-220 nmol/L  
Pubertal males 16-100 nmol/L  
Pubertal females 36-125 nmol/L  
20-49 year old males 16.5-55.9 nmol/L  
>49 year old males 19.3-76.4 nmol/L  
20-49 year old females 24.6-122 nmol/L  
>49 year old females 17.3-76.4 nmol/L
Reported:  
1-3 days  

CPT Codes:  
84270-90  

LOINC Codes:  
13967-5
Shiga Toxin Assay
P315

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Daily, day shift
Methodology:
Rapid membrane enzyme immunoassay
Reported:
2 days
Additional Information:
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

This test is for the simultaneous qualitative detection and differentiation of Shiga toxin 1 and Shiga toxin 2.

Reflex Testing:
Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

Synonyms:
- Hemolytic uremic syndrome
- HUS
- verocytotoxin

COLLECTION

Sample Type:
Stool
Collect:
Urine cup or C & S (Cary & Blair) transport media
Amount to Collect:
5 mL
Preferred Volume:
5 mL
Minimum Volume:
Fresh stool: 0.5 mL or size of pea. Stool in C & S (Cary & Blair) transport medium: 5 mL
Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

Stability (from collection to initiation):
Unpreserved 3 hours, preserved and refrigerated 2 weeks

Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: P315
Performing Lab: Microbiology
Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.
Preferred Volume:
5 mL
Minimum Volume:
Fresh stool: 0.5 mL or size of pea. Stool in C & S (Cary & Blair) transport medium: 5 mL
Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.
Stability (from collection to initiation):
Unpreserved 3 hours, preserved and refrigerated 2 weeks

RESULT INTERPRETATION

Reference Interval:
Not detected
Critical Values:
Inpatient results only. After hours outpatient results will be phoned the following morning. Shiga Toxin detected
Additional Information:
Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

This test is for the simultaneous qualitative detection and differentiation of Shiga toxin 1 and Shiga toxin 2.

ADMINISTRATIVE

CPT Codes:
87427 x2
LOINC Codes:
29257-3

COMPLETE VIEW

Available Stat:
No
Test Code: P315
Performing Lab: Microbiology
Performed:
Daily, day shift
Methodology:
Rapid membrane enzyme immunoassay
Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.
Collect:
   Urine cup or C & S (Cary & Blair) transport media

Amount to Collect:
   5 mL

Sample Type:
   Stool

Preferred Volume:
   5 mL

Minimum Volume:
   Fresh stool: 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

Unacceptable Conditions:
   Unpreserved stool received > 3 hours after collection. More than two samples per day.

Specimen Preparation:
   If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

Reference Interval:
   Not detected

Critical Values:
   Inpatient results only. After hours outpatient results will be phoned the following morning. Shiga Toxin detected

Synonyms:
   • Hemolytic uremic syndrome
   • HUS
   • verocytotoxin

Stability (from collection to initiation):
   Unpreserved 3 hours, preserved and refrigerated 2 weeks

Reported:
   2 days

Reflex Testing:
   Culture for E. coli O157 and Shiga Toxin Assay is automatically performed on stools submitted for bacterial culture, and are billed separately.

Additional Information:
   Bacterial Culture-Stool, E. coli O157 Culture, and Shiga Toxin Assay are orderable as a panel in Apex (Community-Acquired Diarrhea Testing Panel). If testing for individual components of this panel is desired, please contact the microbiology lab.

   This test is for the simultaneous qualitative detection and differentiation of Shiga toxin 1 and Shiga toxin 2.

CPT Codes:
   87427 x2

LOINC Codes:
   29257-3
Sialic Acid

ORDERING

Available Stat: No
Performing Lab: JMC
Reported: Turnaround: 2-4 weeks.

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: See preferred volume
Preferred Volume: 5 mL urine
Remarks: A detailed clinical history must accompany the test request or be sent by fax to (215) 955-9554.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group: Sialic acid
Sendout: Yes
Performing Lab: JMC
Specimen Preparation: Ship by Federal Express at room temperature:

Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 394, 1024 Locust St., Philadelphia, PA 19107, ph: (215) 955-4923, fax: 955-9554, david.wenger@mail.tju.edu
Preferred Volume: 5 mL urine

RESULT INTERPRETATION

Reference Interval: Negative

COMPLETE VIEW

Available Stat: No
Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Test Group:
   Sialic acid

Performing Lab:
   JMC

Sendout:
   Yes

Remarks:
   A detailed clinical history must accompany the test request or be sent by fax to (215) 955-9554.

Collect:
   Urine cup

Amount to Collect:
   See preferred volume

Sample Type:
   Random urine

Preferred Volume:
   5 mL urine

Specimen Preparation:
   Ship by Federal Express at room temperature:

   Dr. David A. Wenger, Jefferson Medical College, Jefferson Alumni Hall, Rm. 394, 1024 Locust St., Philadelphia, PA 19107, ph: (215) 955-4923, fax: 955-9554, david.wenger@mail.tju.edu

Reference Interval:
   Negative

Reported:
   Turnaround: 2-4 weeks.
Sirolimus
SIRO

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Daily (day shift)
Methodology: Abbott Architect Chemiluminescent Immunoassay
Reported: For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.
Additional Information: Sirolimus is an immunosuppressant drug used to prevent organ graft rejection. Therapeutic drug monitoring is used to optimize dose.
This method yields results approximately 20% higher than the Abbott IMx immunoassay due to improved extraction and recovery of sirolimus from whole blood samples. Information regarding cross reactivity of this assay with metabolites and other drugs can be found in the link to the Lab Procedure. See the lab manual’s “A Guide on Drug Level Monitoring” (in the Chemistry Guide) for additional information.
Synonyms: • Rapamune

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top
Amount to Collect: 2 mL blood
Preferred Volume: 2 mL whole blood
Minimum Volume: 0.3 mL whole blood

Note: This volume does not allow for repeat testing if needed.
Remarks:
Time to steady state: 6-10 days
Trough samples should be collected no more than 30-60 minutes before next dose

PROCESSING

Test Code: SIRO
Performing Lab: China Basin Chemistry
Specimen Preparation: Refrigerate
Preferred Volume: 2 mL whole blood
Minimum Volume:
0.3 mL whole blood

Note: This volume does not allow for repeat testing if needed.

RESULT INTERPRETATION

Units:
µg/L

Reference Interval:
Therapeutic trough: 5 - 15 µg/L

Additional Information:
Sirolimus is an immunosuppressant drug used to prevent organ graft rejection. Therapeutic drug monitoring is used to optimize dose.

This method yields results approximately 20% higher than the Abbott IMx immunoassay due to improved extraction and recovery of sirolimus from whole blood samples. Information regarding cross reactivity of this assay with metabolites and other drugs can be found in the link to the Lab Procedure. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
80195

LOINC Codes:
29247-4

COMPLETE VIEW

Available Stat:
No

Test Code:
SIRO

Performing Lab:
China Basin Chemistry

Performed:
Daily (day shift)

Methodology:
Abbott Architect Chemiluminescent Immunoassay

Remarks:
Time to steady state: 6-10 days

Trough samples should be collected no more than 30-60 minutes before next dose

Collect:
Lavender top

Amount to Collect:
2 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
2 mL whole blood

Minimum Volume:
0.3 mL whole blood

Note: This volume does not allow for repeat testing if needed.

Specimen Preparation:
Refrigerate
Units:
µg/L

Reference Interval:
Therapeutic trough: 5 - 15 µg/L

Synonyms:
- Rapamune

Reported:
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

Additional Information:
Sirolimus is an immunosuppressant drug used to prevent organ graft rejection. Therapeutic drug monitoring is used to optimize dose.

This method yields results approximately 20% higher than the Abbott IMx immunoassay due to improved extraction and recovery of sirolimus from whole blood samples. Information regarding cross reactivity of this assay with metabolites and other drugs can be found in the link to the Lab Procedure. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
80195

LOINC Codes:
29247-4
Sjogren's Antibodies
SSAB

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Once a week (usually Tuesday day shift)
Methodology:
Chemiluminescent
Reported:
2-9 days
Additional Information:
Antibodies to SSA (Ro) are present in approximately 60-70% of patients with Sjogren's syndrome and 30-40% of patients with systemic lupus erythematosus (SLE). The presence of this autoantibody in pregnant women has been associated with development of neonatal congenital heart block and neonatal lupus. Antibodies to SSB (La) are found in approximately 60% of patients with Sjogren's syndrome and 11-24% of patients with SLE.

Clinical correlation is advised. Repeat testing may be considered, if clinically indicated.

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code:
SSAB
Performing Lab:
Immunology
Specimen Preparation:
Freeze serum at -20C
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

RESULT INTERPRETATION
Units:
Chemiluminescent Units (CU)

Reference Interval:
anti-SSA-Ro52, anti-SSA-Ro60 and anti-SSB:

Negative: < 20 CU
Positive: >= 20 CU

Additional Information:
Antibodies to SSA (Ro) are present in approximately 60-70% of patients with Sjogren's syndrome and 30-40% of patients with systemic lupus erythematosus (SLE). The presence of this autoantibody in pregnant women has been associated with development of neonatal congenital heart block and neonatal lupus. Antibodies to SSB (La) are found in approximately 60% of patients with Sjogren's syndrome and 11-24% of patients with SLE.

Clinical correlation is advised. Repeat testing may be considered, if clinically indicated.

ADMINISTRATIVE

CPT Codes:
86235 x3

LOINC Codes:
33569-5

COMPLETE VIEW

Available Stat:
No

Test Code:
SSAB

Performing Lab:
Immunology

Performed:
Once a week (usually Tuesday day shift)

Methodology:
Chemiluminescent

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

Specimen Preparation:
Freeze serum at -20C

Units:
Chemiluminescent Units (CU)

Reference Interval:
anti-SSA-Ro52, anti-SSA-Ro60 and anti-SSB:

Negative: < 20 CU
Positive: >= 20 CU
Reported: 2-9 days

Additional Information: Antibodies to SSA (Ro) are present in approximately 60-70% of patients with Sjogren's syndrome and 30-40% of patients with systemic lupus erythematosus (SLE). The presence of this autoantibody in pregnant women has been associated with development of neonatal congenital heart block and neonatal lupus. Antibodies to SSB (La) are found in approximately 60% of patients with Sjogren's syndrome and 11-24% of patients with SLE. Clinical correlation is advised. Repeat testing may be considered, if clinically indicated.

CPT Codes: 86235 x3

LOINC Codes: 33569-5
Smooth Muscle Antibodies
ASMGAB

ORDERING

Available Stat: 
No
Performing Lab: 
Immunology
Performed: 
Thursday (day shift)
Methodology: 
EIA
Reported: 
2 - 8 days
Synonyms: 
- ACTIN IgG ANTIBODIES

COLLECTION

Sample Type: 
Serum
Collect: 
Gold top
Amount to Collect: 
1.0 (blood)
Preferred Volume: 
0.5 (serum)
Minimum Volume: 
0.5 (serum)
Unacceptable Conditions: 
- Grossly hemolyzed, icteric or lipemic serum

PROCESSING

Test Code: 
ASMGAB
Performing Lab: 
Immunology
Specimen Preparation: 
Freeze sample at -20C
Preferred Volume: 
0.5 (serum)
Minimum Volume: 
0.5 (serum)
Unacceptable Conditions: 
- Grossly hemolyzed, icteric or lipemic serum

RESULT INTERPRETATION

Units: 
Units
Reference Interval:
Negative: < 20 Units
Weak Positive: 20 - 30 Units
Moderate to Strong Positive: > 30 Units

ADMINISTRATIVE

CPT Codes:
83516

LOINC Codes:
44706-0

COMPLETE VIEW

Available Stat:
No

Test Code:
ASMGAB

Performing Lab:
Immunology

Performed:
Thursday (day shift)

Methodology:
EIA

Collect:
Gold top

Amount to Collect:
1.0 (blood)

Sample Type:
Serum

Preferred Volume:
0.5 (serum)

Minimum Volume:
0.5 (serum)

Unacceptable Conditions:
Grossly hemolyzed, Icteric or lipemic serum

Specimen Preparation:
Freeze sample at -20C

Units:
Units

Reference Interval:
Negative: < 20 Units
Weak Positive: 20 - 30 Units
Moderate to Strong Positive: > 30 Units

Synonyms:
- ACTIN IgG ANTIBODIES

Reported:
2 - 8 days

CPT Codes:
83516

LOINC Codes:
44706-0
SNP Array for Blood analysis
SNPAB

ORDERING

Approval Required:
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff.

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Methodology:
850K SNP Array

Reported:
10-14 days

Additional Information:

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy.
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds) Imbalances of regions not represented on the array.
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination).

Synonyms:
- SNP array blood

COLLECTION

Sample Type:
EDTA or heparinized whole blood

Extracted DNA may also be acceptable, contact Cytogenetics 514-8964.

Collect:
Lavender top preferred, Dark green top acceptable

Amount to Collect:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood

Preferred Volume:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood
- Extracted DNA: 10 micrograms

Minimum Volume:
- Adult: 2 mL blood
- Infant/Child: 2 mL blood
- Extracted DNA: 10 micrograms

Remarks:
- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays.
- Do not collect sample in lithium heparin (Lt. Green top).
- Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 2 weeks.

Unacceptable Conditions:
Insufficient volume, unlabeled tubes, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

**PROCESSING**

**Test Code:**
- SNPAB

**Performing Lab:**
- Medical Genomics - Cytogenetics (Microarray)

**Specimen Preparation:**
- Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics.

For questions, contact the microarray laboratory at 514-8964.

**Preferred Volume:**
- Adult: 5 mL blood
- Infant/Child: 3 mL blood
- Extracted DNA: 10 micrograms

**Minimum Volume:**
- Adult: 2 mL blood
- Infant/Child: 2 mL blood
- Extracted DNA: 10 micrograms

**Unacceptable Conditions:**
- Insufficient volume, unlabeled tubes, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 2 weeks.

**RESULT INTERPRETATION**

**Additional Information:**

- **Limitations**
  - Genomic aberrations that may not be detected by SNP array assay include:
  - Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
  - Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy.
  - Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
  - Imbalances of regions not represented on the array.
  - Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination).

**ADMINISTRATIVE**

**CPT Codes:**
- 81229

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply.

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Approval Required:**
- Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff.

**Available Stat:**
- No

**Test Code:**
- SNPAB

**Performing Lab:**
- Medical Genomics - Cytogenetics (Microarray)

**Methodology:**
850K SNP Array

Remarks:
- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays.
- Do not collect sample in lithium heparin (Lt. Green top).
- Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Collect:
- Lavender top preferred, Dark green top acceptable

Amount to Collect:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood

Sample Type:
- EDTA or heparinized whole blood
- Extracted DNA may also be acceptable, contact Cytogenetics 514-8964.

Preferred Volume:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood
- Extracted DNA: 10 micrograms

Minimum Volume:
- Adult: 2 mL blood
- Infant/Child: 2 mL blood
- Extracted DNA: 10 micrograms

Unacceptable Conditions:
- Insufficient volume, unlabeled tubes, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

Specimen Preparation:
- Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE**. Transport asap to China Basin Cytogenetics.

For questions, contact the microarray laboratory at 514-8964.

Synonyms:
- SNP array blood

Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 2 weeks.

Reported:
- 10-14 days

Additional Information:

Limitations
- Genomic aberrations that may not be detected by SNP array assay include:
  - Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
  - Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy.
  - Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
  - Imbalances of regions not represented on the array.
  - Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination).

CPT Codes:
- 81229

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply.

LDT or Modified FDA:
- Yes
SNP Array for Prenatal Analysis
SNPAP

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Methodology:
850K SNP Array

Reported:
For direct array analysis, 3-8 days from the time sample is received in laboratory and insurance authorization is obtained; TAT will be longer if reflexed from normal chromosome analysis or if culture is required due to insufficient sample volume or quality (ordering clinician will be notified)

Additional Information:
Method
High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.

The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

Accuracy
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.

Detection of aneuploidy and triploidy: 15 aneuploidy and 2 triploidy prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.

Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.

Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies

Synonyms:
- SNP array amniocentesis
- SNP array CVS
- SNP array chorionic villus sample

Printed 06/07/19
Test information subject to change
**COLLECTION**

**Sample Type:**
Amniotic fluid or chorionic villi only

**Collect:**
Sterile centrifuge tube, CVS in transport media provided by lab

**Amount to Collect:**
See preferred volume.

**Preferred Volume:**

- **Direct Array ONLY:**
  - Amniotic fluid: 25 mL non-bloody fluid (20 mL for array, 5 mL for backup)
  - Placental Villi: 20-25 mg
  - Cultured cells: 2 confluent T25 flasks

- Chromosome analysis with reflex to array if normal
  - Amniotic fluid: 30 mL non-bloody fluid
  - Placental Villi: 30 mg

- Additional fluid or villi may be needed if additional tests are ordered

- Aneuvysion FISH add 5 mL amniotic fluid or 5 mg villi.

**Minimum Volume:**
- Amniotic fluid: 20 mL
- Villi: 20 mg

- These minimum amounts may limit testing that can be performed

**Remarks:**
- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays.
- Do not collect sample in lithium heparin (Lt. Green top).

- Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

**Stability (from collection to initiation):**
- 24 hours at Room temperature

**Unacceptable Conditions:**
- Leaking, contaminated, frozen or mislabeled tube(s)

**PROCESSING**

**Test Code:**
SNPAP

**Performing Lab:**
Medical Genomics - Cytogenetics (Microarray)

**Specimen Preparation:**
Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics

- For questions, contact the microarray laboratory at 514-8964

**Preferred Volume:**

- Direct Array ONLY:
  - Amniotic fluid: 25 mL non-bloody fluid (20 mL for array, 5 mL for backup)
  - Placental Villi: 20-25 mg
  - Cultured cells: 2 confluent T25 flasks
Chromosome analysis with reflex to array if normal
Amniotic fluid 30 mL non-bloody fluid
Placental Villi 30 mg

Additional fluid or villi may be needed if additional tests are ordered

Aneuvysion FISH add 5 mL amniotic fluid or 5 mg villi.

Minimum Volume:
Amniotic fluid 20 mL
Villi 20 mg

These minimum amounts may limit testing that can be performed

Unacceptable Conditions:
Leaking, contaminated, frozen or mislabeled tube(s)

Stability (from collection to initiation):
24 hours at Room temperature

RESULT INTERPRETATION

Additional Information:
Method
High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.

The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

Accuracy
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.
Detection of aneuploidy and triploidy: 15 aneuploidy and 2 triploidy prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.
Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.
Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies.
ADMINISTRATIVE

CPT Codes:
81229, 88233

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply.

LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No

Test Code:
SNPAP

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Methodology:
850K SNP Array

Remarks:

Insurance pre-authorization required for outpatients

Only collect samples Monday - Friday and avoid holidays.

Do not collect sample in lithium heparin (Lt. Green top).

Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Collect:
Sterile centrifuge tube, CVS in transport media provided by lab

Amount to Collect:
See preferred volume.

Sample Type:
Amniotic fluid or chorionic villi only

Preferred Volume:
Direct Array ONLY:
Amniotic fluid 25 mL non-bloody fluid (20 mL for array 5 mL for backup)
Placental Villi 20-25 mg
Cultured cells 2 confluent T25 flasks

Chromosome analysis with reflex to array if normal
Amniotic fluid 30 mL non-bloody fluid
Placental Villi 30 mg

Additional fluid or villi may be needed if additional tests are ordered

Aneuvyision FISH add 5 mL amniotic fluid or 5 mg villi.

Minimum Volume:
Amniotic fluid 20 mL
Villi 20 mg

These minimum amounts may limit testing that can be performed

Unacceptable Conditions:
Leaking, contaminated, frozen or mislabeled tube(s)

Specimen Preparation:
Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics
For questions, contact the microarray laboratory at 514-8964

**Synonyms:**
- SNP array amniocentesis
- SNP array CVS
- SNP array chorionic villus sample

**Stability (from collection to initiation):**
24 hours at Room temperature

**Reported:**
For direct array analysis, 3-8 days from the time sample is received in laboratory and insurance authorization is obtained; TAT will be longer if reflexed from normal chromosome analysis or if culture is required due to insufficient sample volume or quality (ordering clinician will be notified)

**Additional Information:**

**Method**
High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.

The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

**Accuracy**
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.

Detection of aneuploidy and triploidy: 15 aneuploidy and 2 triploidy prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.

Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.

Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).

**Limitations**
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies

**CPT Codes:**
81229, 88233

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply.

**LDT or Modified FDA:**
Yes
SNP Array for Tissue and POC
SNPAT

ORDERING

Available Stat:
- No

Performing Lab:
- Medical Genomics - Cytogenetics (Microarray)

Methodology:
- 850K SNP Array

Reported:
- 7-10 days

Additional Information:

Method
High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.

The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

Accuracy
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.

Detection of aneuploidy and triploidy: 15 aneuploidy and 2 triploidy prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.

Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.

Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies

The lab will charge a tissue culture setup fees (TCPOC) if SNP microarray is ordered without chromosome studies

Synonyms:
- SNP array amniocentesis
- SNP array CVS
- SNP array chorionic villus sample
ACGHT

- Array CGH Tissue or Products of Conception

**COLLECTION**

**Sample Type:**
- Tissue or POC

**Collect:**
- Sterile centrifuge tube with transport media provided by lab, Hanks balanced salt solution or RPMI with antibiotics

**Amount to Collect:**
- 1 cc (Cubic centimeter) or 20 mg tissue

**Preferred Volume:**
- 1 cc (Cubic centimeter) or 20 mg tissue

**Minimum Volume:**
- 0.3 cc (Cubic centimeter) or 15 mg tissue

**Remarks:**
- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays if possible.
- Label tube with type of tissue being submitted
- Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

**Stability (from collection to initiation):**
- 48 hours at Room temperature

**Unacceptable Conditions:**
- Leaking, contaminated, frozen or mislabeled tube(s)

**PROCESSING**

**Test Code:**
- SNPAT

**Performing Lab:**
- Medical Genomics - Cytogenetics (Microarray)

**Specimen Preparation:**
- Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

**Preferred Volume:**
- 1 cc (Cubic centimeter) or 20 mg tissue

**Minimum Volume:**
- 0.3 cc (Cubic centimeter) or 15 mg tissue

**Unacceptable Conditions:**
- Leaking, contaminated, frozen or mislabeled tube(s)

**Stability (from collection to initiation):**
- 48 hours at Room temperature

**RESULT INTERPRETATION**

**Additional Information:**
- Method
  - High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.
The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

Accuracy
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.

Detection of aneuploidy and triploidy: 15 aneuploidy and 2 triploidy prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.

Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.

Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies

The lab will charge a tissue culture setup fees (TCPOC) if SNP microarray is ordered without chromosome studies

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**ADMINISTRATIVE**

**CPT Codes:**
- 81229, 88233

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- SNPAT

**Performing Lab:**
- Medical Genomics - Cytogenetics (Microarray)

**Methodology:**
- 850K SNP Array

**Remarks:**
- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays if possible.
- Label tube with type of tissue being submitted
Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Collect:
Sterile centrifuge tube with transport media provided by lab, Hanks balanced salt solution or RPMI with antibiotics

Amount to Collect:
1 cc (Cubic centimeter) or 20 mg tissue

Sample Type:
Tissue or POC

Preferred Volume:
1 cc (Cubic centimeter) or 20 mg tissue

Minimum Volume:
0.3 cc (Cubic centimeter) or 15 mg tissue

Unacceptable Conditions:
Leaking, contaminated, frozen or mislabeled tube(s)

Specimen Preparation:
Refrigerate samples DO NOT CENTRIFUGE OR FREEZE. Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

Synonyms:
- SNP array amniocentesis
- SNP array CVS
- SNP array chorionic villus sample
- ACGHT
- Array CGH Tissue or Products of Conception

Stability (from collection to initiation):
48 hours at Room temperature

Reported:
7-10 days

Additional Information:

Method
High density single-nucleotide polymorphism (SNP) oligo BeadChip arrays are used for the assay. Genomic DNA from the prenatal sample is amplified, fragmented, and hybridized to synthetic oligonucleotides covalently deposited on the BeadChip array. A single base-pair extension reaction with nucleotides conjugated to different fluorophores is carried out. Analysis with an imaging system reveals the presence of a major or minor allele at a given SNP, while total fluorescence intensity at a given SNP reflects copy number of that locus.

The Illumina CytoSNP 850k BeadChip contains 850,000 SNP probes distributed across the genome, with average resolution of 18 Kb. This array targets 3,262 genes of clinical significance, as defined by the International Collaboration for Clinical Genomics and Cancer Cytogenetics Microarray Consortium, with resolution averaging 10 Kb in these genes. Overall, these SNP probes cover known disease- or syndrome-related loci, subtelomeric regions, pericentromeric regions, and sex chromosomes. Both copy number and B-allele frequency at a given locus are used to guide clinical interpretation.

Classification of copy number variants (CNVs), ROH, and total genome ploidy is performed primarily using BlueFuse Multi Software.

Accuracy
The Accuracy of detecting clinically significant unbalanced changes by the SNP array is 100%.

Detection of aneuploidy and triploidy: 15 aneuploid and 2 triploid prenatal samples detected by conventional chromosome analysis performed in our laboratory were all precisely detected by the SNP array.

Detection of CNVs: 44 prenatal samples, including 15 with CNVs and 29 with normal findings reported by an external reference laboratory were all precisely confirmed by the SNP array.

Detection of ROH: 1 prenatal sample and 1 blood sample with known ROH were both confirmed by the SNP array.

There were no discrepant results within the capabilities of the SNP array technology in comparison of the samples between the SNP array findings and that of the reference lab/alternative methods (such as karyotyping and DNA methylation test).
Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

The lab will charge a tissue culture setup fees (TCAFCV) if SNP microarray is ordered without chromosomes studies

The lab will charge a tissue culture setup fees (TCPOC) if SNP microarray is ordered without chromosome studies

CPT Codes:
81229, 88233

Note: Additional charges for MCC studies when necessary, culture set-up fees may apply

LDT or Modified FDA:
Yes
SNP Array, Family Follow-Up
PSNPA

ORDERING

Approval Required:
Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff. Insurance authorization required.

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics (Microarray)

Methodology:
850K SNP array

Reported:
10-14 days

Additional Information:

Limitations
Genomic aberrations that may not be detected by SNP array assay include:
- Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
- Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
- Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
- Imbalances of regions not represented on the array
- Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

Synonyms:
- Parental SNP Array

COLLECTION

Sample Type:
EDTA or Heparinized whole blood, Extracted DNA

Collect:
Lavender top preferred, Dark green top acceptable

Amount to Collect:
See preferred volume

Preferred Volume:

<table>
<thead>
<tr>
<th>Category</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>5 mL whole blood</td>
</tr>
<tr>
<td>Infant/Child</td>
<td>3 mL whole blood</td>
</tr>
<tr>
<td>Extracted DNA</td>
<td>10 µg (mcg)</td>
</tr>
</tbody>
</table>

Minimum Volume:

<table>
<thead>
<tr>
<th>Category</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>2 mL whole blood</td>
</tr>
<tr>
<td>Infant/Child</td>
<td>2 mL whole blood</td>
</tr>
<tr>
<td>Extracted DNA</td>
<td>10 µg (mcg)</td>
</tr>
</tbody>
</table>

Remarks:
Insurance pre-authorization required for outpatients

Only collect samples Monday - Friday and avoid holidays.

Do not collect sample in lithium heparin (Lt. Green top).

Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks

PROCESSING
Test Code: PSNPA
Test Group: Microarray
Performing Lab: Medical Genomics - Cytogenetics (Microarray)

Specimen Preparation: Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

Preferred Volume:
- Adult: 5 mL whole blood
- Infant/Child: 3 mL whole blood
- Extracted DNA: 10 µg (mcg)

Minimum Volume:
- Adult: 2 mL whole blood
- Infant/Child: 2 mL whole blood
- Extracted DNA: 10 µg (mcg)

Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 2 weeks

RESULT INTERPRETATION

Additional Information:

**Limitations**
- Genomic aberrations that may not be detected by SNP array assay include:
  - Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
  - Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
  - Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
  - Imbalances of regions not represented on the array
  - Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

ADMINISTRATIVE

CPT Codes:
- 81229

LDT or Modified FDA:
- Yes

LOINC Codes:
- 62375-1

COMPLETE VIEW

Approval Required:
- Yes, if not ordered by Genetics, Neurology or Neonatal Intensive Care Unit faculty or fellows. Requests on inpatients require approval from Cytogenetics/Array staff. Insurance authorization required.

Available Stat:
- No

Test Code:
- PSNPA

Test Group:
- Microarray

Performing Lab:
- Medical Genomics - Cytogenetics (Microarray)
850K SNP array

Remarks:

- Insurance pre-authorization required for outpatients
- Only collect samples Monday - Friday and avoid holidays.
- Do not collect sample in lithium heparin (Lt. Green top).
- Transport sample at room temperature as soon as possible to lab. If transport is delayed refrigerate sample.

Collect:

- Lavender top preferred, Dark green top acceptable

Amount to Collect:

- See preferred volume

Sample Type:

- EDTA or Heparinized whole blood, Extracted DNA

Preferred Volume:

<table>
<thead>
<tr>
<th>Group</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>5 mL whole blood</td>
</tr>
<tr>
<td>Infant/Child</td>
<td>3 mL whole blood</td>
</tr>
</tbody>
</table>

Extracted DNA 10 µg (mcg)

Minimum Volume:

<table>
<thead>
<tr>
<th>Group</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>2 mL whole blood</td>
</tr>
<tr>
<td>Infant/Child</td>
<td>2 mL whole blood</td>
</tr>
</tbody>
</table>

Extracted DNA 10 µg (mcg)

Specimen Preparation:

- Refrigerate samples **DO NOT CENTRIFUGE OR FREEZE.** Transport asap to China Basin Cytogenetics

For questions, contact the microarray laboratory at 514-8964

Synonyms:

- Parental SNP Array

Stability (from collection to initiation):

- Room temperature 4 days, refrigerated 2 weeks

Reported:

- 10-14 days

Additional Information:

- Limitations
  - Genomic aberrations that may not be detected by SNP array assay include:
    - Balanced rearrangement (i.e. balanced translocation, insertion or inversion) and tetraploidy resulted from endoduplication.
    - Low level (<30%) mosaicism for unbalanced rearrangements and aneuploidy
    - Nucleotide sequence changes (i.e. point mutation or small insertion/deletion below the level of detection or cut-off thresholds)
    - Imbalances of regions not represented on the array
    - Genomic changes in mixed samples (i.e. prenatal samples with maternal cell contamination)

CPT Codes:

- 81229

LDT or Modified FDA:

- Yes

LOINC Codes:

- 62375-1
SNP microarray Processing, Extraction and Storage

SNPES

ORDERING

Performing Lab:
Cytogenetics

Performed:
Monday to Friday day shift only

Methodology:
DNA Extraction

Reported:
2-3 days

Additional Information:
DNA will be held for 6 months. If no testing is ordered within that time frame, the DNA will be discarded.

For questions, contact the Cytogenetics-microarray laboratory at 514-8964.

Synonyms:
- Hold for SNP microarray

COLLECTION

Sample Type:
Blood, amniotic fluid, CVS, Tissue, POC

Collect:
Lavender top preferred for blood, Dark green top acceptable

Amount to Collect:
See preferred volume.

Preferred Volume:

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>5 mL blood</td>
</tr>
<tr>
<td>Infant/Child</td>
<td>3 mL blood</td>
</tr>
<tr>
<td>Amniotic fluid</td>
<td>25 ml (25ml for array and 5ml backup)</td>
</tr>
<tr>
<td>Placental Villi</td>
<td>20-25 mg</td>
</tr>
<tr>
<td>Cultured cells</td>
<td>2 confluent T25 flasks</td>
</tr>
<tr>
<td>Tissue</td>
<td>1 cc (Cubic centimeter) or 20 mg tissue</td>
</tr>
</tbody>
</table>

Minimum Volume:

<table>
<thead>
<tr>
<th>Type</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult</td>
<td>2 mL blood</td>
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<tr>
<td>Infant/Child</td>
<td>2 mL blood</td>
</tr>
<tr>
<td>Amniotic fluid</td>
<td>20 ml</td>
</tr>
<tr>
<td>Placental Villi</td>
<td>20 mg</td>
</tr>
<tr>
<td>Cultured cells</td>
<td>2 confluent T25 flasks</td>
</tr>
<tr>
<td>Tissue</td>
<td>0.3 cc (Cubic centimeter) or 15 mg tissue</td>
</tr>
</tbody>
</table>

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks.

Unacceptable Conditions:
Unlabeled tubes, QNS, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

PROCESSING

Test Code:
SNPES

Performing Lab:
Cytogenetics

Specimen Preparation:
Refrigerate samples DO NOT CENTRIFUGE OR FREEZE. Transport asap to China Basin Cytogenetics

For questions, contact the Cytogenetics-microarray laboratory at 514-8964

Preferred Volume:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood
- Amniotic fluid: 25 ml (25ml for array and 5ml backup)
- Placental Villi: 20-25 mg
- Cultured cells: 2 confluent T25 flasks
- Tissue: 1 cc (Cubic centimeter) or 20 mg tissue

Minimum Volume:
- Adult: 2 mL blood
- Infant/Child: 2 mL blood
- Amniotic fluid: 20 ml
- Placental Villi: 20 mg
- Cultured cells: 2 confluent T25 flasks
- Tissue: 0.3 cc (Cubic centimeter) or 15 mg tissue

Unacceptable Conditions:
- Unlabeled tubes, QNS, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

Stability (from collection to initiation):
- Room temperature 4 days, refrigerated 2 weeks.

RESULT INTERPRETATION

Additional Information:
- DNA will be held for 6 months. If no testing is ordered within that time frame, the DNA will be discarded.

For questions, contact the Cytogenetics-microarray laboratory at 514-8964.

ADMINISTRATIVE

CPT Codes:
- 81479

COMPLETE VIEW

Test Code:
- SNPES

Performing Lab:
- Cytogenetics

Performed:
- Monday to Friday day shift only

Methodology:
- DNA Extraction

Collect:
- Lavender top preferred for blood, Dark green top acceptable

Amount to Collect:
- See preferred volume.

Sample Type:
- Blood, amniotic fluid, CVS, Tissue, POC

Preferred Volume:
- Adult: 5 mL blood
- Infant/Child: 3 mL blood
- Amniotic fluid: 25 ml (25ml for array and 5ml backup)
- Placental Villi: 20-25 mg
- Cultured cells: 2 confluent T25 flasks
Tissue 1 cc (Cubic centimeter) or 20 mg tissue

Minimum Volume:
- Adult 2 mL blood
- Infant/Child 2 mL blood
- Amniotic fluid 20 ml
- Placental Villi 20 mg
- Cultured cells 2 confluent T25 flasks
- Tissue 0.3 cc (Cubic centimeter) or 15 mg tissue

Unacceptable Conditions:
Unlabeled tubes, QNS, clotted samples, samples received in Lithium-heparin (Lt. Green top) tubes.

Specimen Preparation:
Refrigerate samples DO NOT CENTRIFUGE OR FREEZE. Transport asap to China Basin Cytogenetics

For questions, contact the Cytogenetics-microarray laboratory at 514-8964

Synonyms:
- Hold for SNP microarray

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 2 weeks.

Reported:
2-3 days

Additional Information:
DNA will be held for 6 months. If no testing is ordered within that time frame, the DNA will be discarded.

For questions, contact the Cytogenetics-microarray laboratory at 514-8964.

CPT Codes:
81479
Sodium, 24 hour (or timed) urine
NAUR

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Ion selective electrode (ISE)
Reported: STAT 1 hour, Routine same or next day.
Additional Information: Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.
Synonyms: Urine electrolytes, Na

COLLECTION

Sample Type: Timed urine collection
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output for collection period
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Remarks: Refrigerate the collection container during the period of the collection.
Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.
Stability (from collection to initiation): Refrigerated 2 days
Unacceptable Conditions: Container not refrigerated during collection.

PROCESSING

Test Code: NAUR
Test Group: Sodium
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine

Minimum Volume:
0.2 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mmol/D

Reference Interval:
Usually 40-220 mmol/D

Additional Information:
Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
84300

COMPLETE VIEW

Available Stat:
Yes

Test Code:
NAUR

Test Group:
Sodium

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Ion selective electrode (ISE)

Remarks:
Refrigerate the collection container during the period of the collection.

Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
24 hour urine collection container

Amount to Collect:
Entire urine output for collection period

Sample Type:
Timed urine collection

Preferred Volume:
1 mL urine

Minimum Volume:
0.2 mL urine
Unacceptable Conditions:
- Container not refrigerated during collection.

Units:
- mmol/D

Reference Interval:
- Usually 40-220 mmol/D

Synonyms:
- Urine electrolytes
- Na

Stability (from collection to initiation):
- Refrigerated 2 days

Reported:
- STAT 1 hour, Routine same or next day.

Additional Information:
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

CPT Codes:
- 84300
Sodium, Body Fluid
NABF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

Synonyms:
• Na
• Body fluid electrolytes

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
NABF

Test Group:
Sodium

Performing Lab:
Parnassus & Mission Bay Chemistry

**Preferred Volume:**
1 mL fluid

**Minimum Volume:**
0.2 mL fluid

**Stability (from collection to initiation):**
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

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**RESULT INTERPRETATION**

**Units:**
mmol/L

**Additional Information:**
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

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**ADMINISTRATIVE**

**CPT Codes:**
84295

**LOINC Codes:**
2950-4

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**COMPLETE VIEW**

**Available Stat:**
No

**Ordering Recommendations:**
Not a routinely available test. See ‘Additional information’

**Test Code:**
NABF

**Test Group:**
Sodium

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Ion selective electrode (ISE)

**Remarks:**
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

**Collect:**
Red top or clean container

**Amount to Collect:**
5 mL fluid

**Sample Type:**
Body Fluid

**Preferred Volume:**
1 mL fluid

**Minimum Volume:**
0.2 mL fluid

**Units:**
- mmol/L

**Synonyms:**
- Na
- Body fluid electrolytes

**Stability (from collection to initiation):**
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

**Reported:**
- 4 hours

**Additional Information:**
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

**CPT Codes:**
- 84295

**LOINC Codes:**
- 2950-4
Sodium, Plasma / Serum

NA

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Ion selective electrode (ISE)
Reported:
STAT 1 hour, Routine 4 hours
Additional Information:
Severely lipemic serum/plasma samples will be treated and reassayed. High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L. Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981. The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(Cl+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

Synonyms:
- Na
- Electrolytes
- Anion gap

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
NA
Test Group:
Sodium
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:

mmol/L

Reference Interval:

<1 year  131 - 145 mmol/L
>= 1 year 135 - 145 mmol/L

1. Normal range for children less than 1 year old adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Critical Values:

<125 mmol/L or > 155 mmol/L

Additional Information:

Severely lipemic serum/plasma samples will be treated and reassayed. High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L. Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981. The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

ADMINISTRATIVE

CPT Codes:

84295

LOINC Codes:

2951-2

COMPLETE VIEW

Available Stat:

Yes

Test Code:

NA

Test Group:

Sodium

Performing Lab:

Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Ion selective electrode (ISE)

Collect:

Light green top preferred, Gold top acceptable

Amount to Collect:

1 mL blood

Sample Type:

Plasma or serum

Preferred Volume:

0.5 mL plasma or serum

Minimum Volume:

0.2 mL plasma or serum

Units:

mmol/L
Reference Interval:

- <1 year: 131 - 145 mmol/L
- >= 1 year: 135 - 145 mmol/L

1. Normal range for children less than 1 year old adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
2. Normal range for adults was determined by testing 271 male and female healthy blood donors at UCSF.

Critical Values:

<125 mmol/L or > 155 mmol/L

Synonyms:

- Na
- Electrolytes
- Anion gap

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:

- STAT 1 hour, Routine 4 hours

Additional Information:

Severely lipemic serum/plasma samples will be treated and reassayed. High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981 The anion gap is calculated from the serum Sodium, Chloride and Total CO2 values using the equation: Na-(CL+CO2). The calculation is automatic whenever all three of the electrolytes are ordered together. It is not a separately orderable test. Normal range for the Anion Gap is 4-14.

CPT Codes:

- 84295

LOINC Codes:

- 2951-2
Sodium, random urine
NAU

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Ion selective electrode (ISE)
Reported: STAT 1 hour, Routine same or next day.
Additional Information: Output varies with diet, but the concentration usually exceeds 20 mmol/L.
Synonyms: Urine electrolytes, Na

COLLECTION

Sample Type: Random urine
Collect: Urine cup
Amount to Collect: 20 mL urine
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Stability (from collection to initiation): Refrigerated 2 days

PROCESSING

Test Code: NAU
Test Group: Sodium
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Stability (from collection to initiation): Refrigerated 2 days

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:

mmol/L

Reference Interval:

Output varies with diet, but the concentration usually exceeds 20 mmol/L.

Additional Information:

Output varies with diet, but the concentration usually exceeds 20 mmol/L.

CPT Codes:

84300

LOINC Codes:

2955-3

Available Stat:

Yes

Test Code:

NAU

Test Group:

Sodium

Performing Lab:

Parnassus & Mission Bay Chemistry

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Ion selective electrode (ISE)

Collect:

Urine cup

Amount to Collect:

20 mL urine

Sample Type:

Random urine

Preferred Volume:

1 mL urine

Minimum Volume:

0.2 mL urine

Units:

mmol/L

Reference Interval:

Output varies with diet, but the concentration usually exceeds 20 mmol/L.

Synonyms:

- Urine electrolytes
- Na

Stability (from collection to initiation):

Refrigerated 2 days

Reported:

STAT 1 hour, Routine same or next day.

Additional Information:

Output varies with diet, but the concentration usually exceeds 20 mmol/L.

CPT Codes:

84300

LOINC Codes:
Sodium, stool
NASTL

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrode (ISE)

Reported:
4 hours

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Synonyms:
- Na
- Stool Electrolytes

COLLECTION

Sample Type:
Watery Stool

Collect:
Urine cup or clean container

Unacceptable Conditions:
Non-watery stool submitted

PROCESSING

Test Code:
NASTL

Test Group:
Sodium

Performing Lab:
Parnassus Chemistry

Unacceptable Conditions:
Non-watery stool submitted

RESULT INTERPRETATION

Additional Information:
Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**

84302

**COMPLETE VIEW**

**Available Stat:**

No

**Ordering Recommendations:**

Not a routinely available test. See ‘Additional information’

**Test Code:**

NASTL

**Test Group:**

Sodium

**Performing Lab:**

Parnassus Chemistry

**Performed:**

Test available 24 hours per day 7 days per week

**Methodology:**

Ion selective electrode (ISE)

**Collect:**

Urine cup or clean container

**Sample Type:**

Watery Stool

**Unacceptable Conditions:**

Non-watery stool submitted

**Synonyms:**

- Na
- Stool Electrolytes

**Reported:**

4 hours

**Additional Information:**

Only very watery specimens can be tested. Specimen will be centrifuged and the test is run on the supernatant.

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

**CPT Codes:**

84302
Sodium, whole blood
NAWB

ORDERING

Available Stat:
Yes
Performing Lab:
- Parnassus Parnassus Chemistry
- Mount Zion MtZ Clinical Laboratory
- Mission Bay Hospital Laboratory
Performed:
Test available 24 hours per day 7 days per week
Methodology:
- Direct Ion selective electrode (ISE)
- Parnassus & Mission Bay: Radiometer ABL 800
- MtZ: Gem Premier 3500
Reported:
Stat 15 min, Routine 30 min
Additional Information:
A level < 110 mmol/L or > 170 mmol/L will automatically be re-assayed.
High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981
Synonyms:
- Na
- Electrolytes

COLLECTION

Sample Type:
Heparinized whole blood (Blood gas syringe only)
Collect:
ABG syringe containing 100U of dry heparin
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood
Remarks:
Venous samples:
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient’s name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry station #151, Mission Bay station #21. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

Unacceptable Conditions:
- Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume
Test Code: NAWB
Test Group: Sodium
Performing Lab: Parnassus Parnassus Chemistry
Mount Zion MtZ Clinical Laboratory
Mission Bay Hospital Laboratory
Preferred Volume: 3 mL blood
Minimum Volume: 1 mL blood
Unacceptable Conditions: Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume

RESULT INTERPRETATION

Units: mmol/L
Reference Interval: 136-146 mmol/L
Critical Values: <125 mmol/L or > 155 mmol/L
Additional Information: A level < 110 mmol/L or > 170 mmol/L will automatically be re-assayed.
High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981

ADMINISTRATIVE

CPT Codes: 84295
LOINC Codes: 2947-0

COMPLETE VIEW

Available Stat: Yes
Test Code: NAWB
Test Group: Sodium
Performing Lab: Parnassus Parnassus Chemistry
Mount Zion MtZ Clinical Laboratory
Mission Bay Hospital Laboratory
Performed: Test available 24 hours per day 7 days per week
Methodology: Direct Ion selective electrode (ISE)
Parnassus & Mission Bay: Radiometer ABL 800
MtZ: Gem Premier 3500
Remarks:
Venous samples:

1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to Parnassus Chemistry station #151, Mission Bay station #21. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

Collect:
- ABG syringe containing 100U of dry heparin
Amount to Collect:
- 3 mL blood
Sample Type:
- Heparinized whole blood (Blood gas syringe only)
Preferred Volume:
- 3 mL blood
Minimum Volume:
- 1 mL blood
Unacceptable Conditions:
- Samples with needle attached, containing large bubbles, unlabeled, clotted or of insufficient volume

Units:
- mmol/L
Reference Interval:
- 136-146 mmol/L
Critical Values:
- <125 mmol/L or > 155 mmol/L
Synonyms:
- Na
- Electrolytes
Reported:
- Stat 15 min, Routine 30 min

Additional Information:
- A level < 110 mmol/L or > 170 mmol/L will automatically be re-assayed.

High levels of glucose can lower electrolyte concentrations, each 100 mg/dL causing an apparent decrease in serum sodium of 1.6 mmol/L Ref: Schrier RW: Manual of Nephrology, Boston, Little Brown, 1981

CPT Codes:
- 84295

LOINC Codes:
- 2947-0
Solid Tumor Cytogenetics
CYSTU

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Giemsa banding and brightfield microscopy
Reported:
1-2 weeks
Synonyms:
- Cytogenetic analysis
- Karyotype
- Karyotyping

COLLECTION

Sample Type:
Fresh tumor tissue (Formalin-fixed, paraffin-embedded unacceptable)
Collect:
Orange screw top tube (25 mL) with transport media available for clinical lab.
Amount to Collect:
1 cubic centimeter of tumor tissue
Preferred Volume:
1 cubic centimeter of tumor tissue
Minimum Volume:
0.5 cubic centimeter of tumor tissue
Remarks:
Collect in transport media provided by lab, keep sample in room temperature until received by lab, specimen must be kept moist and sterile. Transport to laboratory immediately.
Stability (from collection to initiation):
1 day
Unacceptable Conditions:
Sample submitted in formalin or alcohol or other fixative. Frozen samples. Formalin fixed paraffin embedded (FFPE) samples.

PROCESSING

Test Code:
CYSTU
Performing Lab:
Medical Genomics - Cytogenetics
Preferred Volume:
1 cubic centimeter of tumor tissue
Minimum Volume:
0.5 cubic centimeter of tumor tissue
Unacceptable Conditions:
Sample submitted in formalin or alcohol or other fixative. Frozen samples. Formalin fixed paraffin embedded (FFPE) samples.
Stability (from collection to initiation):
1 day
ADMINISTRATIVE

CPT Codes:
88239, 88262, 88280
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
CYSTU
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Giemsa banding and brightfield microscopy
Remarks:
Collect in transport media provided by lab, keep sample in room temperature until received by lab, specimen must be kept moist and sterile. Transport to laboratory immediately.
Collect:
Orange screw top tube (25 mL) with transport media available for clinical lab.
Amount to Collect:
1 cubic centimeter of tumor tissue
Sample Type:
Fresh tumor tissue (Formalin-fixed, paraffin-embedded unacceptable)
Preferred Volume:
1 cubic centimeter of tumor tissue
Minimum Volume:
0.5 cubic centimeter of tumor tissue
Unacceptable Conditions:
Sample submitted in formalin or alcohol or other fixative. Frozen samples. Formalin fixed paraffin embedded (FFPE) samples.
Synonyms:
- Cytogenetic analysis
- Karyotype
- Karyotyping
Stability (from collection to initiation):
1 day
Reported:
1-2 weeks
CPT Codes:
88239, 88262, 88280
LDT or Modified FDA:
Yes

Test information subject to change
Sperm Count and Motility
SPMO

ORDERING
Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).
Synonyms:
- Semen

PROCESSING
Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

COMPLETE VIEW
Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).
Synonyms:
- Semen
Sperm Count, Post Vasectomy
PSCT

ORDERING

Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

Synonyms:

- Pelleted sperm count

PROCESSING

Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

COMPLETE VIEW

Performing Lab:
This test is no longer performed by the UCSF Clinical Laboratories. If testing is desired, please contact the UCSF Reproductive Clinic at (415) 353-7475 (option 1).

Synonyms:

- Pelleted sperm count
Spinal Muscular Atrophy
SMAPCR

ORDERING

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Run 1-2x per week, and as needed.

Methodology:
Real time PCR for copy number analysis and Next Generation Sequencing for linked variant detection.

Reported:
14-21 days

Additional Information:
Spinal muscular atrophy (SMA) is an autosomal recessive disorder with a carrier rate of about 1 in 50 in the US, leading to disease in approximately 1 in 10,000 live births. SMA is a neuromuscular disorder and a frequently inherited cause of infant mortality. SMA is characterized by degeneration of lower motor neurons in the spinal cord and brain stem, leading to muscle wasting and paralysis. The disorder is classified into four subtypes (I-IV) based on the age of onset, which can range from infancy to adulthood. In its most severe form (Type I), SMA leads to death in infancy. In other non-fatal forms, affected individuals become disabled. Treatment in these cases is aimed at slow progression of the disease.

SMN1 Copy Number Assay
SMA is most often caused by deletions in the SMN1 gene and thus molecular testing assesses the number of copies of SMN1. Individuals affected with SMA have 0 copies of the SMN1 gene, whereas individuals with 1 copy of the SMN1 gene are predicted to be carriers of SMA. Individuals with 2 or more copies have a reduced risk to be carriers, namely because individuals, who are carriers of SMA as a result of either 2 or 3 copies of SMN1 on one chromosome and the absence of SMN1 on the other chromosome (termed as 2+0 or 3+0) cannot be detected by this assay. The 2+0 genotype occurs in about 3-4% of the general population. This assay will determine SMN1 copy number, but will not detect intragenic mutations within the SMN1 gene.

SMN1 Linked Variants Assay
Duplication of SMN1 has been linked to a haplotype that spans two linked variants (rs143838139 and rs200800214). The presence of these two variants, especially in Ashkenazi Jews and Asians, increases the likelihood of a 2+0 SMN1 genotype, but does not confirm it. This assay will also determine the presence or absence of these two linked variants. Carrier risks estimation based on SMN1 copy number analysis and detection of the linked variants is shown in the Table below.

SMN2 Copy Number Assay
SMN2 is adjacent to SMN1 on chromosome 5 and differs from it by only a few bases. However, SMN2 expresses only about 10% of functional mRNA due to a defect in RNA splicing. Individuals can carry multiple copy numbers of SMN2, ranging from 0 to 5 copies per chromosome. Thus, the presence of multiple copy numbers of SMN2 with 0 copy SMN1 is associated with reduced severity of SMA, thereby accounting for the various SMA phenotypic subtypes. This assay will also determine SMN2 copy number.

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<td>1 in 3,500</td>
<td>1 in 769</td>
<td>1 in 29</td>
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<tr>
<td>Ashkenazi Jewish</td>
<td>1 in 41</td>
<td>90%</td>
<td>1 in 4,000</td>
<td>1 in 580</td>
<td>Likely Carrier</td>
</tr>
<tr>
<td>Asian</td>
<td>1 in 53</td>
<td>93%</td>
<td>1 in 5,000</td>
<td>1 in 702</td>
<td>Likely Carrier</td>
</tr>
<tr>
<td>African American</td>
<td>1 in 66</td>
<td>71%</td>
<td>1 in 3,000</td>
<td>1 in 396</td>
<td>1 in 34</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1 in 117</td>
<td>91%</td>
<td>1 in 11,000</td>
<td>1 in 1762</td>
<td>1 in 140</td>
</tr>
</tbody>
</table>

5. Sugarman EA et al. Pan-ethnic carrier screening and prenatal diagnosis for spinal muscular atrophy: clinical laboratory analysis of
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

Synonyms:
- Werdnig-Hoffmann disease
- SMA type I, II, III, IV
- Congenital axonal neuropathy

**COLLECTION**

**Sample Type:**
- EDTA whole blood
- Amniotic fluid
- Cultured amniocytes
- Chorionic villi
- Cultured chorionic villi

**Collect:**
- Lavender top

**Amount to Collect:**
- See preferred volume.

**Preferred Volume:**
- Blood 5 ml
- Amniotic fluid 20 ml
- Cultured amniocytes 2 T25 flasks
- Chorionic villi 20 mg
- Cultured chorionic villi 2 T25 flasks

**Minimum Volume:**
- Blood 2 ml
- Amniotic fluid 10 ml
- Cultured amniocytes 1 T25 flasks
- Chorionic villi 10 mg
- Cultured chorionic villi: 1 T25 flask

**Remarks:**
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Unacceptable Conditions:**
- Heparinized samples. Low confluence cultures. Insufficient amount of amniotic fluid or chorionic villi

**PROCESSING**

**Test Code:**
- SMAPCR

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
- Refrigerate sample. DO NOT centrifuge or freeze.

**Preferred Volume:**
- Blood 5 ml
- Amniotic fluid 20 ml
- Cultured amniocytes 2 T25 flasks
- Chorionic villi 20 mg
- Cultured chorionic villi 2 T25 flasks

**Minimum Volume:**
- Blood 2 ml
- Amniotic fluid 10 ml
Cultured amniocytes  1 T25 flasks
Chorionic villi  10 mg
Cultured chorionic villi: 1 T25 flask

Unacceptable Conditions:
Heparinized samples. Low confluence cultures. Insufficient amount of amniotic fluid or chorionic villi

RESULT INTERPRETATION

Reference Interval:
- SMN1: 2 copies
- SMN2: 2 copies
- SMN1 c.*3+80T>G (rs143838139)
- SMN1 c.*211_*212del(rs200800214)

Additional Information:
Spinal muscular atrophy (SMA) is an autosomal recessive disorder with a carrier rate of about 1 in 50 in the US, leading to disease in approximately 1 in 10,000 live births. SMA is a neuromuscular disorder and a frequently inherited cause of infant mortality. SMA is characterized by degeneration of lower motor neurons in the spinal cord and brain stem, leading to muscle wasting and paralysis. The disorder is classified into four subtypes (I-IV) based on the age of onset, which can range from infancy to adulthood. In its most severe form (Type I), SMA leads to death in infancy. In other non-fatal forms, affected individuals become disabled. Treatment in these cases is aimed at slow progression of the disease.

SMN1 Copy Number Assay
SMA is most often caused by deletions in the SMN1 gene and thus molecular testing assesses the number of copies of SMN1. Individuals affected with SMA have 0 copies of the SMN1 gene, whereas individuals with 1 copy of the SMN1 gene are predicted to be carriers of SMA. Individuals with 2 or more copies have a reduced risk to be carriers, namely because individuals, who are carriers of SMN1 as a result of either 2 or 3 copies of SMN1 on one chromosome and the absence of SMN1 on the other chromosome (termed as 2+0 or 3+0) cannot be detected by this assay. The 2+0 genotype occurs in about 3-4% of the general population. This assay will determine SMN1 copy number, but will not detect intragenic mutations within the SMN1 gene.

SMN1 Linked Variants Assay
Duplication of SMN1 has been linked to a haplotype that spans two linked variants (rs143838139 and rs200800214). The presence of these two variants, especially in Ashkenazi Jews and Asians, increases the likelihood of a 2+0 SMN1 genotype, but does not confirm it. This assay will also determine the presence or absence of these two linked variants. Carrier risks estimation based on SMN1 copy number analysis and detection of the linked variants is shown in the Table below.

SMN2 Copy Number Assay
SMN2 is adjacent to SMN1 on chromosome 5 and differs from it by only a few bases. However, SMN2 expresses only about 10% of functional mRNA due to a defect in RNA splicing. Individuals can carry multiple copy numbers of SMN2, ranging from 0 to 5 copies per chromosome. Thus, the presence of multiple copy numbers of SMN2 with 0 copy SMN1 is associated with reduced severity of SMA, thereby accounting for the various SMA phenotypic subtypes. This assay will also determine SMN2 copy number.

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This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

**ADMINISTRATIVE**

**CPT Codes:**
- 81329

**LDT or Modified FDA:**
- Yes

**COMPLETE VIEW**

**Test Code:**
- SMAPCR

**Performing Lab:**
- Medical Genomics - Molecular Diagnostics

**Performed:**
- Run 1-2x per week, and as needed.

**Methodology:**
- Real time PCR for copy number analysis and Next Generation Sequencing for linked variant detection.

**Remarks:**
- Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

**Collect:**
- Lavender top

**Amount to Collect:**
- See preferred volume.

**Sample Type:**
- EDTA whole blood
- Amniotic fluid
- Cultured amniocytes
- Chorionic villi
- Cultured chorionic villi

**Preferred Volume:**
- Blood: 5 ml
- Amniotic fluid: 20 ml
- Cultured amniocytes: 2 T25 flasks
- Chorionic villi: 20 mg
- Cultured chorionic villi: 2 T25 flasks

**Minimum Volume:**
- Blood: 2 ml
- Amniotic fluid: 10 ml
- Cultured amniocytes: 1 T25 flasks
- Chorionic villi: 10 mg
- Cultured chorionic villi: 1 T25 flask

**Unacceptable Conditions:**
- Heparinized samples. Low confluence cultures. Insufficient amount of amniotic fluid or chorionic villi

**Specimen Preparation:**
- Refrigerate sample. DO NOT centrifuge or freeze.

**Reference Interval:**
- SMN1: 2 copies
- SMN2: 2 copies
- SMN1 c."3+80T>G (rs143838139)
- SMN1 c."211_*212del(rs200800214)

**Synonyms:**
- Werdnig-Hoffmann disease
- SMA type I, II, III, IV
Congenital axonal neuropathy

Reported:
14-21 days

Additional Information:
Spinal muscular atrophy (SMA) is an autosomal recessive disorder with a carrier rate of about 1 in 50 in the US, leading to disease in approximately 1 in 10,000 live births. SMA is a neuromuscular disorder and a frequently inherited cause of infant mortality. SMA is characterized by degeneration of lower motor neurons in the spinal cord and brain stem, leading to muscle wasting and paralysis. The disorder is classified into four subtypes (I-IV) based on the age of onset, which can range from infancy to adulthood. In its most severe form (Type I), SMA leads to death in infancy. In other non-fatal forms, affected individuals become disabled. Treatment in these cases is aimed at slow progression of the disease.

SMN1 Copy Number Assay
SMA is most often caused by deletions in the \textit{SMN1} gene and thus molecular testing assesses the number of copies of \textit{SMN1}. Individuals affected with SMA have 0 copies of the \textit{SMN1} gene, whereas individuals with 1 copy of the \textit{SMN1} gene are predicted to be carriers of SMA. Individuals with 2 or more copies have a reduced risk to be carriers, namely because individuals, who are carriers of SMA as a result of either 2 or 3 copies of \textit{SMN1} on one chromosome and the absence of \textit{SMN1} on the other chromosome (termed as 2+0 or 3+0) cannot be detected by this assay. The 2+0 genotype occurs in about 3-4% of the general population. This assay will determine SMN1 copy number, but will not detect intragenic mutations within the \textit{SMN1} gene.

SMN1 Linked Variants Assay
Duplication of \textit{SMN1} has been linked to a haplotype that spans two linked variants (rs143838139 and rs200800214). The presence of these two variants, especially in Ashkenazi Jews and Asians, increases the likelihood of a 2+0 \textit{SMN1} genotype, but does not confirm it. This assay will also determine the presence or absence of these two linked variants. Carrier risks estimation based on SMN1 copy number analysis and detection of the linked variants is shown in the Table below.

SMN2 Copy Number Assay
\textit{SMN2} is adjacent to \textit{SMN1} on chromosome 5 and differs from it by only a few bases. However, \textit{SMN2} expresses only about 10% of functional mRNA due to a defect in RNA splicing. Individuals can carry multiple copy numbers of \textit{SMN2}, ranging from 0 to 5 copies per chromosome. Thus, the presence of multiple copy numbers of \textit{SMN2} with 0 copy \textit{SMN1} is associated with reduced severity of SMA, thereby accounting for the various SMA phenotypic subtypes. This assay will also determine \textit{SMN2} copy number.

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CPT Codes:
81329

LDT or Modified FDA:
Yes
Sporotrichosis Serology
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Latex Agglutination
Reported:
3-5 days
Additional Information:
Sporotrichosis is an endemic fungal infection caused by the dimorphic fungus Sporothrix schenckii. Most cases of sporotrichosis have been reported from the subtropical and tropical regions of the Americas, but a global distribution is likely. The organism is often isolated from soil, plants, or plant products (wood), and occupational or recreational exposure to these materials is often implicated in infected individuals.

Infections due to Sporothrix schenckii can be differentiated into several distinct syndromes:

- Cutaneous form of the disease is most common, often arising from sites of minor skin trauma. The primary erythematous, papulonodular lesion may range from several millimeters to 4 cm in size. Secondary lesions develop proximally along lymphatic channels. These generally painless lesions usually do not involve lymph nodes, although lymphadenopathy may develop.

- Extracutaneous sporotrichosis can be manifested as osteoarticular involvement of a single joint. Major joints of the extremities (ankle, knee, elbow, hand) are most often involved. The affected joint is swollen and painful, with an attendant effusion. Systemic symptoms are minimal.

- Pulmonary sporotrichosis with cavitary lesions also has been described.

- Multifocal extracutaneous syndrome has been described, consisting of multijoint involvement, or widely scattered cutaneous lesions. Constitutional symptoms (fever, weight loss) are often noted, and spread to bone and central nervous system may occur. Underlying immune system suppression is often a contributing factor. Untreated infection is ultimately fatal.

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.15 mL serum
Stability (from collection to initiation):
Refrigerated or frozen 2 weeks

PROCESSING

Test Code:
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Sendout:
Yes
Performing Lab:
Specimen Preparation:
Refrigerate sample

Preferred Volume:
1 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated or frozen 2 weeks

RESULT INTERPRETATION

Additional Information:
Sporotrichosis is an endemic fungal infection caused by the dimorphic fungus Sporothrix schenckii. Most cases of sporotrichosis have been reported from the subtropical and tropical regions of the Americas, but a global distribution is likely. The organism is often isolated from soil, plants, or plant products (wood), and occupational or recreational exposure to these materials is often implicated in infected individuals.

Infections due to Sporothrix schenckii can be differentiated into several distinct syndromes:

Cutaneous form of the disease is most common, often arising from sites of minor skin trauma. The primary erythematous, papulonodular lesion may range from several millimeters to 4 cm in size. Secondary lesions develop proximally along lymphatic channels. These generally painless lesions usually do not involve lymph nodes, although lymphadenopathy may develop.

Extracutaneous sporotrichosis can be manifested as osteoarticular involvement of a single joint. Major joints of the extremities (ankle, knee, elbow, hand) are most often involved. The affected joint is swollen and painful, with an attendant effusion. Systemic symptoms are minimal.

-Pulmonary sporotrichosis with cavitary lesions also has been described.

Multifocal extracutaneous syndrome has been described, consisting of multijoint involvement, or widely scattered cutaneous lesions. Constitutional symptoms (fever, weight loss) are often noted, and spread to bone and central nervous system may occur. Underlying immune system suppression is often a contributing factor. Untreated infection is ultimately fatal.

ADMINISTRATIVE

CPT Codes:
86671-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Latex Agglutination

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

**Minimum Volume:**

0.15 mL serum

**Specimen Preparation:**

Refrigerate sample

**Stability (from collection to initiation):**

Refrigerated or frozen 2 weeks

**Reported:**

3-5 days

**Additional Information:**

Sporotrichosis is an endemic fungal infection caused by the dimorphic fungus Sporothrix schenckii. Most cases of sporotrichosis have been reported from the subtropical and tropical regions of the Americas, but a global distribution is likely. The organism is often isolated from soil, plants, or plant products (wood), and occupational or recreational exposure to these materials is often implicated in infected individuals.

Infections due to Sporothrix schenckii can be differentiated into several distinct syndromes:

Cutaneous form of the disease is most common, often arising from sites of minor skin trauma. The primary erythematous, papulonodular lesion may range from several millimeters to 4 cm in size. Secondary lesions develop proximally along lymphatic channels. These generally painless lesions usually do not involve lymph nodes, although lymphadenopathy may develop.

Extracutaneous sporotrichosis can be manifested as osteoarticular involvement of a single joint. Major joints of the extremities (ankle, knee, elbow, hand) are most often involved. The affected joint is swollen and painful, with an attendant effusion. Systemic symptoms are minimal.

- Pulmonary sporotrichosis with cavitary lesions also has been described.

- Multifocal extracutaneous syndrome has been described, consisting of multijoint involvement, or widely scattered cutaneous lesions. Constitutional symptoms (fever, weight loss) are often noted, and spread to bone and central nervous system may occur. Underlying immune system suppression is often a contributing factor. Untreated infection is ultimately fatal.

**CPT Codes:**

86671-90
# St. Louis Equine Encephalitis Antibody

## ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Focus via Quest

**Methodology:**
- IFA

**Reported:**
- Test performed 5x per week. Turnaround 3-5 days

## COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top or Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 2 weeks, frozen at -20°C 6 months.

## PROCESSING

**Test Code:**
- SLOUB

**Sendout:**
- Yes

**Performing Lab:**
- Focus via Quest

**Specimen Preparation:**
- Freeze serum at -20°C. Order Quest test #2649F

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.1 mL serum

**Stability (from collection to initiation):**
- Room temperature 2 days, refrigerated 2 weeks, frozen at -20°C 6 months.

## RESULT INTERPRETATION

**Units:**
- Titer

**Reference Interval:**
- IgG: < 1:16 titer
- IgM: < 1:20 titer

Test information subject to change
ADMINISTRATIVE

CPT Codes:
86653-90 (x2)

LOINC Codes:
9578-6

COMPLETE VIEW

Available Stat:
No

Test Code:
SLOUB

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
IFA

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.1 mL serum

Specimen Preparation:
Freeze serum at -20C. Order Quest test #2649F

Units:
Titer

Reference Interval:
IgG: < 1:16 titer
IgM: < 1:20 titer

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 2 weeks, frozen at -20C 6 months.

Reported:
Test performed 5x per week. Turnaround 3-5 days

CPT Codes:
86653-90 (x2)

LOINC Codes:
9578-6
Staph aureus Culture
P115

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shift.
Methodology:
Culture
Reported:
2-4 days
Reflex Testing:
Susceptibility testing is performed if Staphylococcus aureus is isolated.

COLLECTION

Sample Type:
Anterior nares swab to screen for carrier, skin or soft tissue swab
Collect:
Swab in Amies transport medium with charcoal
Remarks:
Anterior nares swab:
1. Run both swabs quickly under tap water to slightly moisten the swabs.
2. Using both swabs at the same time, gently insert the swabs approx 1/4 " into the anterior nares (just inside the nasal orofice). Swab in a circular motion; and repeat in second nostril, using the same two (2) swabs.
3. Place swabs into Amies transport media with charcoal, cap and deliver to Microbiology.

Stability (from collection to initiation):
24 hours at room temperature or refrigerated

Unacceptable Conditions:
Swabs not submitted in Amies transport medium with charcoal

PROCESSING

Test Code:
P115
Performing Lab:
Microbiology

Unacceptable Conditions:
Swabs not submitted in Amies transport medium with charcoal

Stability (from collection to initiation):
24 hours at room temperature or refrigerated

ADMINISTRATIVE

CPT Codes:
87081

COMPLETE VIEW
Available Stat: No
Test Code: P115
Performing Lab: Microbiology
Performed: Set up daily, day and evening shift.
Methodology: Culture
Remarks: Anterior nares swab:
  1. Run both swabs quickly under tap water to slightly moisten the swabs.
  2. Using both swabs at the same time, gently insert the swabs approx 1/4 " into the anterior nares (just inside the nasal orofice). Swab in a circular motion; and repeat in second nostril, using the same two (2) swabs.
  3. Place swabs into Amies transport media with charcoal, cap and deliver to Microbiology.
Collect: Swab in Amies transport medium with charcoal
Sample Type: Anterior nares swab to screen for carrier, skin or soft tissue swab
Unacceptable Conditions: Swabs not submitted in Amies transport medium with charcoal
Stability (from collection to initiation): 24 hours at room temperature or refrigerated
Reported: 2-4 days
Reflex Testing: Susceptibility testing is performed if Staphylococcus aureus is isolated.
CPT Codes: 87081
Steroid Panel, Congenital Adrenal Hyperplasia
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS/MS
Reported: 4-7 days
Additional Information:
Includes:
Androstenedione; 11-Deoxycortisol; Cortisol; DHEA, Unconjugated; 17-Hydroxypregnenolone; Progesterone; 17-Hydroxyprogesterone; Testosterone, Total, LC/MS/MS; Deoxycorticosterone
Synonyms:
• CAH

COLLECTION

Sample Type: Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.25 mL serum
Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen 1 month
Unacceptable Conditions:
Hemolysis, gross lipemia, gross icterus. Collected in Gold top or other gel containing tube.
Rejection Criteria:
Hemolysis, gross lipemia, gross icterus

PROCESSING

Test Code:
MOLT (Order in Apex as ‘Miscellaneous Outside Lab Test’ using the complete test name above)
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Spin, aliquot and freeze serum at -20C. Order Quest test # 90398
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.25 mL serum

Printed 06/07/19
Test information subject to change
Unacceptable Conditions:
Hemolysis, gross lipemia, gross icterus. Collected in Gold top or other gel containing tube.

Rejection Criteria:
Hemolysis, gross lipemia, gross icterus

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION

Additional Information:
Includes:
Androstenedione; 11-Deoxycortisol; Cortisol; DHEA, Unconjugated; 17-Hydroxypregnenolone; Progesterone; 17-Hydroxyprogesterone; Testosterone, Total, LC/MS/MS; Deoxycorticosterone

ADMINISTRATIVE

CPT Codes:
82157-90, 82634-90, 82533-90, 82626-90, 84143-90, 84144-90, 83498-90, 84403-90, 82633-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.25 mL serum

Rejection Criteria:
Hemolysis, gross lipemia, gross icterus

Unacceptable Conditions:
Hemolysis, gross lipemia, gross icterus. Collected in Gold top or other gel containing tube.

Specimen Preparation:
Spin, aliquot and freeze serum at -20C. Order Quest test # 90398

Synonyms:
• CAH

Stability (from collection to initiation):
Room temperature 3 days, refrigerated 1 week, frozen 1 month

Reported:
4-7 days

Additional Information:
Includes:

Androstenedione; 11-Deoxycortisol; Cortisol; DHEA, Unconjugated; 17-Hydroxyprogrenolone; Progesterone; 17-Hydroxyprogesterone; Testosterone, Total, LC/MS/MS; Deoxycorticosterone

CPT Codes:

82157-90, 82634-90, 82533-90, 82626-90, 84143-90, 84144-90, 83498-90, 84403-90, 82633-90
Sterols
STER

ORDERING

Performing Lab:
Mayo
Methodology:
Gas Chromatography-Mass Spectrometry (GC-MS)/Gas Chromatography-Flame Ionization Detection (GC-FID)
Reported:
7-9 days
Additional Information:
Testing includes desmosterol, lathosterol, campesterol, and sitosterol for the investigation of desmosterolosis and sitosterolemia.

COLLECTION

Patient Preparation:
Fasting (12 hours or more, infants just before next feeding).
Sample Type:
Plasma
Collect:
Dark green top or lavender top
Amount to Collect:
2 mL
Preferred Volume:
1 mL
Minimum Volume:
0.2 mL
Stability (from collection to initiation):
Frozen/refrigerated: 90 days (plasma)

PROCESSING

Test Code:
STER
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Spin down within 45 minutes of draw. Aliquot and freeze. Transport to CB frozen. Order Mayo test code STER.
Preferred Volume:
1 mL
Minimum Volume:
0.2 mL
Stability (from collection to initiation):
Frozen/refrigerated: 90 days (plasma)

RESULT INTERPRETATION

Additional Information:
Testing includes desmosterol, lathosterol, campesterol, and sitosterol for the investigation of desmosterolosis and sitosterolemia.
ADMINISTRATIVE

CPT Codes:
82542-90

LOINC Codes:
75740-1, 75738-5, 75741-9, 75739-3

COMPLETE VIEW

Test Code:
STER

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Gas Chromatography-Mass Spectrometry (GC-MS)/Gas Chromatography-Flame Ionization Detection (GC-FID)

Patient Preparation:
Fasting (12 hours or more, infants just before next feeding).

Collect:
Dark green top or lavender top

Amount to Collect:
2 mL

Sample Type:
Plasma

Preferred Volume:
1 mL

Minimum Volume:
0.2 mL

Specimen Preparation:
Spin down within 45 minutes of draw. Aliquot and freeze. Transport to CB frozen. Order Mayo test code STER.

Stability (from collection to initiation):
Frozen/refrigerated: 90 days (plasma)

Reported:
7-9 days

Additional Information:
Testing includes desmosterol, lathosterol, campesterol, and sitosterol for the investigation of desmosterolosis and sitosterolemia.

CPT Codes:
82542-90

LOINC Codes:
75740-1, 75738-5, 75741-9, 75739-3
Streptococcus Group A Antigen
P116

**ORDERING**

Available Stat:
Yes

Performing Lab:
Microbiology

Performed:
Daily, day and evening shifts until 9 PM

Methodology:
Lateral flow immunassay

Reported:
1 hour after receipt at China Basin Microbiology

Additional Information:
- Sensitivity is approximately 70% compared with culture. Culture will be performed automatically on antigen negative samples.
- Excess blood or mucus on the swab may interfere with the test performance and may yield a false positive result.

Reflex Testing:
- Negative samples are automatically reflexed to culture at an additional charge.

Synonyms:
- Beta-hemolytic Strep
- beta-strep

**COLLECTION**

Sample Type:
Throat swab

Collect:
Polyester (Dacron) swabs x2 in paper envelope or in clean, dry plastic tube (Do not use charcoal transport media)

Amount to Collect:
2 swabs

Preferred Volume:
2 swabs

Minimum Volume:
2 swabs

If only one swab is received, Group A Streptococcus Culture will be performed instead of the antigen test.

Remarks:
- Swab tonsils or tonsilar crypts and posterior pharynx.
- Deliver immediately to laboratory. Refrigerate if transport is delayed.

Stability (from collection to initiation):
- Refrigerated 3 days

Unacceptable Conditions:
- Swab submitted in charcoal media

**PROCESSING**

Test Code:
P116

Test Group:
Streptococcus
Performing Lab: Microbiology

Specimen Preparation:
If antigen test is negative set up a group A strep culture

Preferred Volume:
2 swabs

Minimum Volume:
2 swabs

If only one swab is received, Group A Streptococcus Culture will be performed instead of the antigen test.

Unacceptable Conditions:
Swab submitted in charcoal media

Stability (from collection to initiation):
Refrigerated 3 days

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Sensitivity is approximately 70% compared with culture. Culture will be performed automatically on antigen negative samples.

Excess blood or mucus on the swab may interfere with the test performance and may yield a false positive result.

ADMINISTRATIVE

CPT Codes:
87880

LOINC Codes:
18481-2

COMPLETE VIEW

Available Stat:
Yes

Test Code:
P116

Test Group:
Streptococcus

Performing Lab:
Microbiology

Performed:
Daily, day and evening shifts until 9 PM

Methodology:
Lateral flow immunassay

Remarks:
Swab tonsils or tonsilar crypts and posterior pharynx.

Deliver immediately to laboratory. Refrigerate if transport is delayed.

Collect:
Polyester (Dacron) swabs x2 in paper envelope or in clean, dry plastic tube (Do not use charcoal transport media)

Amount to Collect:
2 swabs

Sample Type:
Throat swab
Preferred Volume:
2 swabs

Minimum Volume:
2 swabs

If only one swab is received, Group A Streptococcus Culture will be performed instead of the antigen test.

Unacceptable Conditions:
Swab submitted in charcoal media

Specimen Preparation:
If antigen test is negative set up a group A strep culture

Reference Interval:
Negative

Synonyms:
- Beta-hemolytic Strep
- beta-strep

Stability (from collection to initiation):
Refrigerated 3 days

Reported:
1 hour after receipt at China Basin Microbiology

Reflex Testing:
Negative samples are automatically reflexed to culture at an additional charge.

Additional Information:
Sensitivity is approximately 70% compared with culture. Culture will be performed automatically on antigen negative samples.

Excess blood or mucus on the swab may interfere with the test performance and may yield a false positive result.

CPT Codes:
87880

LOINC Codes:
18481-2
Streptococcus Group A Culture
P118

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, all shifts
Methodology:
Selective media
Reported:
2 days
Additional Information:
If other organisms are requested the specimen will be processed as Bacterial Culture, Respiratory
Synonyms:
- Bacterial culture
- Beta-hemolytic Strep
- beta-strep
- Throat culture

COLLECTION

Sample Type:
Throat swab
Collect:
Polyester swab in charcoal transport media.

Note: If Streptococcus Group A antigen testing is also being requested it is required to submit two polyester swabs in a paper envelope.
Remarks:
If other throat organisms are of interest they must be specified on the Microbiology requisition.
Stability (from collection to initiation):
Room temperature 24 hours

PROCESSING

Test Code:
P118
Performing Lab:
Microbiology
Stability (from collection to initiation):
Room temperature 24 hours

RESULT INTERPRETATION

Reference Interval:
Negative
Additional Information:
If other organisms are requested the specimen will be processed as Bacterial Culture, Respiratory

ADMINISTRATIVE
CPT Codes:
87081

LOINC Codes:
11268-0

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
P118

**Performing Lab:**
Microbiology

**Performed:**
Set up daily, all shifts

**Methodology:**
Selective media

**Remarks:**
If other throat organisms are of interest they must be specified on the Microbiology requisition.

**Collect:**
Polyester swab in charcoal transport media.

**Note:** If Streptococcus Group A antigen testing is also being requested it is required to submit two polyester swabs in a paper envelope.

**Sample Type:**
Throat swab

**Reference Interval:**
Negative

**Synonyms:**
- Bacterial culture
- Beta-hemolytic Strep
- beta-strep
- Throat culture

**Stability (from collection to initiation):**
Room temperature 24 hours

**Reported:**
2 days

**Additional Information:**
If other organisms are requested the specimen will be processed as Bacterial Culture, Respiratory

CPT Codes:
87081

LOINC Codes:
11268-0
Streptococcus Group B Culture
P138

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Culture
Reported:
3 days
Additional Information:
For detection of carriers prior to delivery.
If penicillin allergy is indicated on the requisition microbiology will perform susceptibility studies to erythromycin and clindamycin.
Synonyms:
• Bacterial culture

COLLECTION

Sample Type:
Anal-vaginal swab
Collect:
Swab in Todd-Hewitt (LIM) broth available from Microbiology or swab in charcoal transport medium (NOT preferred)
Remarks:
Collect combined rectal and introital sample.
Indicate on requisition if the patient is allergic to penicillin.
Stability (from collection to initiation):
Room temperature 12 hours
Unacceptable Conditions:
Swabs not received in Todd-Hewitt (LIM) broth or charcoal transport media.

PROCESSING

Test Code:
P138
Performing Lab:
Microbiology
Specimen Preparation:
Put swabs received in charcoal transport medium into Todd-Hewitt (LIM) broth.
Unacceptable Conditions:
Swabs not received in Todd-Hewitt (LIM) broth or charcoal transport media.
Stability (from collection to initiation):
Room temperature 12 hours

RESULT INTERPRETATION

Critical Values:
Positive culture from L&D patient.
Additional Information:
   For detection of carriers prior to delivery.

   If penicillin allergy is indicated on the requisition microbiology will perform susceptability studies to erythromycin and clindamycin.

**ADMINISTRATIVE**

CPT Codes:
   87081

LOINC Codes:
   582-7

**COMPLETE VIEW**

Available Stat:
   No

Test Code:
   P138

Performing Lab:
   Microbiology

Performed:
   Set up daily, day and evening shifts

Methodology:
   Culture

Remarks:
   Collect combined rectal and introital sample.

   Indicate on requisition if the patient is allergic to penicillin.

Collect:
   Swab in Todd-Hewitt (LIM) broth available from Microbiology or swab in charcoal transport medium (NOT preferred)

Sample Type:
   Anal-vaginal swab

Unacceptable Conditions:
   Swabs not received in Todd-Hewitt (LIM) broth or charcoal transport media.

Specimen Preparation:
   Put swabs received in charcoal transport medium into Todd-Hewitt (LIM) broth.

Critical Values:
   Positive culture from L&D patient.

Synonyms:
   - Bacterial culture

Stability (from collection to initiation):
   Room temperature 12 hours

Reported:
   3 days

Additional Information:
   For detection of carriers prior to delivery.

   If penicillin allergy is indicated on the requisition microbiology will perform susceptability studies to erythromycin and clindamycin.

CPT Codes:
   87081

LOINC Codes:
   582-7
### Strongyloides Antibody (IgG)

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Focus via Quest

**Methodology:**
- Immunoassay

**Reported:**
- Set up 2x per week, turnaround 5-7 days

**Additional Information:**
The assay has been 88% sensitive and 80% specific, but may cross-react with antibody to Echinococcus species, hookworm, filaria, and Paragonimus species, though occult Strongyloides coinfection in patients infected with those organisms cannot be excluded.

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Red top or Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Stability (from collection to initiation):**
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month

### PROCESSING

**Test Code:**
- STRONG

**Test Group:**
- Strongyloides

**Sendout:**
- Yes

**Performing Lab:**
- Focus via Quest

**Specimen Preparation:**
- Refrigerate sample. Order Quest 66324P

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Stability (from collection to initiation):**
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month

### RESULT INTERPRETATION

Test information subject to change.
Reference Interval:
Negative

Additional Information:
The assay has been 88% sensitive and 80% specific, but may cross-react with antibody to Echinococcus species, hookworm, filaria, and Paragonimus species, though occult Strongyloides coinfection in patients infected with those organisms cannot be excluded.

CPT Codes:
86682-90

LOINC Codes:
34376-4

COMPLETE VIEW

Available Stat:
No

Test Code:
STRONG

Test Group:
Strongyloides

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Immunnoassay

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate sample. Order Quest 66324P

Reference Interval:
Negative

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month

Reported:
Set up 2x per week, turnaround 5-7 days

Additional Information:
The assay has been 88% sensitive and 80% specific, but may cross-react with antibody to Echinococcus species, hookworm, filaria, and Paragonimus species, though occult Strongyloides coinfection in patients infected with those organisms cannot be excluded.

CPT Codes:
86682-90

LOINC Codes:
34376-4
Subtelomere FISH
CYSUB

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily, Monday-Friday

Methodology:
Fluorescent in-situ hybridization

Additional Information:
Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Synonyms:
- Cytogenetic analysis
- Chromosome analysis
- Karyotype
- Karyotyping

COLLECTION

Sample Type:
Heparinized whole blood, Unfixed tissue

Collect:
Blood: Dark green top
POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
2 ml blood

Preferred Volume:
2 mL blood

Minimum Volume:
1 mL blood

Remarks:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Stability (from collection to initiation):
48 hours

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
CYSUB

Test Group:
Chromosome Analysis

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Preferred Volume:
2 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
48 hours

RESULT INTERPRETATION

Reference Interval:
Normal. See Additional Information

Additional Information:
Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA '88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

ADMINISTRATIVE

CPT Codes:
88273x3, 88271x8

LDT or Modified FDA:
Yes

LOINC Codes:
49040-9

COMPLETE VIEW

Available Stat:
No

Test Code:
CYSUB

Test Group:
Chromosome Analysis

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily, Monday-Friday

Methodology:
Fluorescent in-situ hybridization

Remarks:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason.

Collect:
Blood: Dark green top
POC: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
2 ml blood
Sample Type:
Heparinized whole blood, Unfixed tissue

Preferred Volume:
2 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
Keep samples at Room temperature. DO NOT CENTRIFUGE for any reason. Send all tubes and completed paperwork asap to the Cytogenetics laboratory at China Basin.

Reference Interval:
Normal. See Additional Information

Synonyms:
- Cytogenetic analysis
- chromosome analysis
- Karyotype
- Karyotyping

Stability (from collection to initiation):
48 hours

Reflex Testing:
If an abnormality is detected the Director will determine the appropriate additional studies to be performed to characterize the abnormality.

Additional testing may be omitted if specifically requested when the sample is submitted for cytogenetic analysis.

Additional Information:
Each FISH test is developed and its performance characteristics determined by the UCSF Cytogenetics Laboratory as required by CLIA ’88 regulations. It has not been cleared or approved for specific uses by the U.S. Food and Drug Administration. All FISH probes undergo internal validation and quality control testing at UCSF Cytogenetics Lab prior to use.

CPT Codes:
88273x3, 88271x8

LDT or Modified FDA:
Yes

LOINC Codes:
49040-9
Sulfatide Autoantibody
SULFAB

ORDERING

Performing Lab:
Quest

Methodology:
ELISA

Reported:
7-10 days

COLLECTION

Sample Type:
Serum

Collect:
Gold top or Red top

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL

Stability (from collection to initiation):
Room Temperature: 72 hours
Refrigerated: 21 days
Frozen: 4 months

Storage/Transport Temperature:
Frozen

PROCESSING

Test Code:
SULFAB

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Aliquot and freeze. Send to CB frozen. Order Quest test code 30175.

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL

Stability (from collection to initiation):
Room Temperature: 72 hours
Refrigerated: 21 days
Frozen: 4 months

Storage/Transport Temperature:
Frozen

RESULT INTERPRETATION
**Reference Interval:**

<table>
<thead>
<tr>
<th></th>
<th>IgM</th>
<th>IgG</th>
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<tbody>
<tr>
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<tr>
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<td>1100</td>
<td>900</td>
</tr>
<tr>
<td>Very High</td>
<td>1700</td>
<td>1500</td>
</tr>
</tbody>
</table>

**ADMINISTRATIVE**

**CPT Codes:**

83520x2

**LOINC Codes:**

49549-9, 8251-1, 8265-1

**COMPLETE VIEW**

**Test Code:**

SULFAB

**Performing Lab:**

Quest

**Sendout:**

Yes

**Methodology:**

ELISA

**Collect:**

Gold top or Red top

**Amount to Collect:**

4 mL blood

**Sample Type:**

Serum

**Preferred Volume:**

2 mL serum

**Minimum Volume:**

0.5 mL

**Specimen Preparation:**

Aliquot and freeze. Send to CB frozen. Order Quest test code 30175.

**Reference Interval:**

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<td>900</td>
</tr>
<tr>
<td>Very High</td>
<td>1700</td>
<td>1500</td>
</tr>
</tbody>
</table>

**Storage/Transport Temperature:**

Frozen

**Stability (from collection to initiation):**

Room Temperature: 72 hours
Refrigerated: 21 days
Frozen: 4 months

**Reported:**

7-10 days

**CPT Codes:**

83520x2

**LOINC Codes:**

49549-9, 8251-1, 8265-1

Test information subject to change
Supersaturation Profile, Urine
SUPSAT

ORDERING

Ordering Recommendations:
Use for kidney stone risk assessment and monitoring; includes interpretation of data. Panel includes calcium, chloride, citric acid, creatinine, magnesium, oxalate, pH, phosphorous, potassium, sodium, sulfate, and uric acid.

Performing Lab:
ARUP

Performed:
Wed, Fri

Methodology:
Quantitative Spectrophotometry/Quantitative Enzymatic/Quantitative Ion-Selective Electrode

Reported:
1-8 days

Synonyms:
• Calculi Risk
• Calculus Risk
• chorde
• citric aci
• creatinine
• Kidney Stone Profile
• Kidney Stone Risk Assessment
• magnesium
• oxalate
• phosphorus
• potassium
• Stone Risk Profile
• sulfate
• uric acid

COLLECTION

Collect:
24-hour urine. Refrigerate during collection.

Remarks:
Record total volume and collection time interval on tube and test request form.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.

PROCESSING

Test Code:
SUPSAT

ARUP Test Code:
2008771

Sendout:
Yes
Performing Lab:
ARUP

Specimen Preparation:
Thoroughly mix entire collection (24-hour) in one container. Transport four separate 4 mL aliquots of urine using Calculi Risk/Supersaturation Urine Collection Kit (ARUP supply# 46007). Available online through eSupply using ARUP Connect(TM) or contact Client Services at (800) 522-2787. Do not exceed 4 mL in tubes.
Aliquot according to the following specifications:
1st aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
2nd aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
3rd aliquot (pH 9): Transfer 4 mL urine into a Sodium Carbonate Tube. (Min: 4 mL) Mix well. Freeze immediately.
4th aliquot: Transfer 4 mL urine into an Unpreserved Tube. (Min: 4 mL) Freeze immediately.
If collection kit is unavailable, transport four 4 mL unadjusted aliquots of urine.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Storage/Transport Temperature:
Frozen.

RESULT INTERPRETATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH, Urine</td>
<td>5.0-7.5</td>
</tr>
<tr>
<td>Calcium, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Calcium free diet: 5-40 mg/d</td>
<td>5-40 mg/d</td>
</tr>
<tr>
<td>Low Calcium Diet (800 mg/d or less)</td>
<td>50-150 mg/d</td>
</tr>
<tr>
<td>Average Calcium diet (about 800 mg/d)</td>
<td>100-250 mg/d</td>
</tr>
<tr>
<td>High Calcium diet (800 mg/d or greater)</td>
<td>Effective February 21, 2012</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Calcium/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td>51-286 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Sulfate, Urine</td>
<td>6-30 mmol/d</td>
</tr>
<tr>
<td>Uric Acid, Urine</td>
<td>250-750 mg/d</td>
</tr>
<tr>
<td>Citric Acid, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Citric Acid, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Magnesium, Urine</td>
<td>Effective August 15, 2011</td>
</tr>
<tr>
<td></td>
<td>12-199 mg/d</td>
</tr>
<tr>
<td>Phosphorus, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Phosphorus, Urine - per volume</td>
<td>Refer to report</td>
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<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>Components</td>
</tr>
<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Chloride, Urine</td>
<td>Components</td>
</tr>
</tbody>
</table>

Printed 06/07/19
Test information subject to change
### Components | Reference Interval
---|---
#### pH, Urine
5.0-7.5

#### Calcium, Urine

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium free diet: 5-40 mg/d</td>
<td>5-40 mg/d</td>
</tr>
<tr>
<td>Low Calcium Diet (800 mg/d or less)</td>
<td>50-150 mg/d</td>
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<td>100-250 mg/d</td>
</tr>
<tr>
<td>High Calcium diet (800 mg/d or greater)</td>
<td>Effective February 21, 2012</td>
</tr>
<tr>
<td>Greater than 250 mg/d</td>
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</table>

#### Creatinine, Urine - per 24h
Refer to report

#### Calcium/Creatinine Ratio, Urine
Refer to report

#### Oxalate, Urine

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
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<tbody>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Oxalate, Urine - per 24h</td>
<td>Refer to report</td>
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</tbody>
</table>

#### Sodium, Urine

<table>
<thead>
<tr>
<th>Component</th>
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</thead>
<tbody>
<tr>
<td>Sodium, Urine</td>
<td>51-286 mmol/d</td>
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<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
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#### Sulfate, Urine

<table>
<thead>
<tr>
<th>Component</th>
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<tbody>
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<td>Sulfate, Urine</td>
<td>5-30 mmol/d</td>
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#### Uric Acid, Urine

<table>
<thead>
<tr>
<th>Component</th>
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<td>Uric Acid, Urine</td>
<td>250-750 mg/d</td>
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#### Citric Acid, Urine

<table>
<thead>
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<th>Components</th>
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<tbody>
<tr>
<td>Citric Acid, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Citric Acid/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

#### Magnesium, Urine

<table>
<thead>
<tr>
<th>Component</th>
<th>Reference Interval</th>
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</thead>
<tbody>
<tr>
<td>Magnesium, Urine</td>
<td>Effective August 15, 2011</td>
</tr>
<tr>
<td></td>
<td>12-199 mg/d</td>
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</tbody>
</table>

#### Phosphorus, Urine

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus, Urine - per volume</td>
<td>Refer to report</td>
</tr>
<tr>
<td>Phosphorus/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
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</tbody>
</table>

#### Potassium, Urine

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<tr>
<td>Potassium, Urine</td>
<td>25-125 mmol/d</td>
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</table>

#### Chloride, Urine

<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
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</thead>
<tbody>
<tr>
<td>Chloride, Urine</td>
<td>140-250 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
<td>Refer to report</td>
</tr>
</tbody>
</table>

### Age | Male | Female
---|---|---
3-8 years | 140-700 mg/d | 140-700 mg/d
9-12 years | 300-1300 mg/d | 300-1300 mg/d
13-17 years | 500-2300 mg/d | 400-1600 mg/d
18-50 years | 1000-2500 mg/d | 700-1600 mg/d
51-80 years | 800-2100 mg/d | 500-1400 mg/d
81 years and older | 600-2000 mg/d | 400-1300 mg/d

### Interpretive Data:
The values determined for this specimen are placed on the chart to indicate the approximate risk associated with the particular concentrations. Increased risk is to the right of center; decreased risk, to the left. Relative supersaturation calculated for calcium oxalate, calcium hydrogen phosphate (brushite) and uric acid calculi is displayed. Relative risk increases from the middle to the right side of this chart.
CPT Codes:
82340; 82436; 82507; 84560; 83735; 83945; 84105; 84133; 84300; 84392; 83986

Ordering Recommendations:
Use for kidney stone risk assessment and monitoring; includes interpretation of data. Panel includes calcium, chloride, citric acid, creatinine, magnesium, oxalate, pH, phosphorous, potassium, sodium, sulfate, and uric acid.

Test Code:
SUPSAT

ARUP Test Code:
2008771

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Wed, Fri

Methodology:
Quantitative Spectrophotometry/Quantitative Enzymatic/Quantitative Ion-Selective Electrode

Remarks:
Record total volume and collection time interval on tube and test request form.

Collect:
24-hour urine. Refrigerate during collection.

Specimen Preparation:
Thoroughly mix entire collection (24-hour) in one container. Transport four separate 4 mL aliquots of urine using Calculi Risk/Supersaturation Urine Collection Kit (ARUP supply# 46007). Available online through eSupply using ARUP Connect(TM) or contact Client Services at (800) 522-2787. Do not exceed 4 mL in tubes.

Aliquot according to the following specifications:
1st aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
2nd aliquot (pH 2): Transfer 4 mL urine into a Sulfamic Acid Tube. (Min: 4 mL) Mix well. Freeze immediately.
3rd aliquot (pH 9): Transfer 4 mL urine into a Sodium Carbonate Tube. (Min: 4 mL) Mix well. Freeze immediately.
4th aliquot: Transfer 4 mL urine into an Unpreserved Tube. (Min: 4 mL) Freeze immediately.

If collection kit is unavailable, transport four 4 mL unadjusted aliquots of urine.

Reference Interval:

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<tr>
<td>Calcium/Creatinine Ratio, Urine</td>
<td>Refer to report</td>
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<tr>
<td>Oxalate, Urine</td>
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<td>Components</td>
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</tr>
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<td>Refer to report</td>
</tr>
<tr>
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<td>Refer to report</td>
</tr>
<tr>
<td>Sodium, Urine</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Reference Interval</td>
</tr>
</tbody>
</table>

Printed 06/07/19
Test information subject to change
### Sodium, Urine
- **Reference Interval**: 51-286 mmol/d
- **Creatinine, Urine - per 24h**: Refer to report

### Sulfate, Urine
- **Reference Interval**: 6-30 mmol/d

### Uric Acid, Urine
- **Reference Interval**: 250-750 mg/d

### Components
- **Reference Interval**:
  - Citric Acid, Urine - per 24h: Refer to report
  - Citric Acid/Creatinine Ratio, Urine: Refer to report

### Magnesium, Urine
- **Effective August 15, 2011**: 12-199 mg/d

### Components
- **Reference Interval**:
  - Phosphorus, Urine - per volume: Refer to report
  - Phosphorus/Creatinine Ratio, Urine: Refer to report

### Potassium, Urine
- **Reference Interval**: 25-125 mmol/d

### Chloride, Urine
- **Reference Interval**: 140-250 mmol/d

### Components
- **Reference Interval**:
  - Chloride, Urine - per 24h: Refer to report

### pH, Urine
- **Reference Interval**: 5.0-7.5

### Calcium, Urine
**Components**
- Calcium free diet: 5-40 mg/d
- Low Calcium Diet (800 mg/d or less): 50-150 mg/d
- Average Calcium diet (about 800 mg/d): 100-250 mg/d
- High Calcium diet (800 mg/d or greater): Effective February 21, 2012
  - Greater than 250 mg/d

- **Creatinine, Urine - per 24h**: Refer to report
  - Calcium/Creatinine Ratio, Urine: Refer to report

### Oxalate, Urine
- **Reference Interval**:
  - Creatinine, Urine - per 24h: Refer to report
  - Oxalate, Urine - per 24h: Refer to report

### Sodium, Urine
- **Reference Interval**: 51-286 mmol/d

### Sulfate, Urine
- **Reference Interval**: 6-30 mmol/d

### Uric Acid, Urine
- **Reference Interval**: 250-750 mg/d

### Components
- **Reference Interval**: Citric Acid, Urine - per 24h: Refer to report
  - Citric Acid/Creatinine Ratio, Urine: Refer to report

### Magnesium, Urine
- **Effective August 15, 2011**: 12-199 mg/d

### Components
- **Reference Interval**: Phosphorus, Urine - per volume: Refer to report
  - Phosphorus/Creatinine Ratio, Urine: Refer to report

### Phosphorus, Urine
- **Reference Interval**: Potassium, Urine

### Potassium, Urine
- **Reference Interval**:
<table>
<thead>
<tr>
<th>Components</th>
<th>Reference Interval</th>
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</thead>
<tbody>
<tr>
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</tr>
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<td>Creatinine, Urine - per 24h</td>
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</tr>
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<td>Chloride, Urine</td>
<td>140-250 mmol/d</td>
</tr>
<tr>
<td>Creatinine, Urine - per 24h</td>
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</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-8 years</td>
<td>140-700 mg/d</td>
<td>140-700 mg/d</td>
</tr>
<tr>
<td>9-12 years</td>
<td>300-1300 mg/d</td>
<td>300-1300 mg/d</td>
</tr>
<tr>
<td>13-17 years</td>
<td>500-2300 mg/d</td>
<td>400-1600 mg/d</td>
</tr>
<tr>
<td>18-50 years</td>
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<td>81 years and older</td>
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<td>400-1300 mg/d</td>
</tr>
</tbody>
</table>

Interpretive Data:

The values determined for this specimen are placed on the chart to indicate the approximate risk associated with the particular concentrations. Increased risk is to the right of center; decreased risk, to the left. Relative supersaturation calculated for calcium oxalate, calcium hydrogen phosphate (brushite) and uric acid calculi is displayed. Relative risk increases from the middle to the right side of this chart.

Synonyms:
- Calculi Risk
- Calculus Risk
- chloride
- citric acid
- creatinine
- Kidney Stone Profile
- Kidney Stone Risk Assessment
- magnesium
- oxalate
- phosphorus
- potassium
- Stone Risk Profile
- sulfate
- uric acid

Storage/Transport Temperature:
Frozen.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: Unacceptable; Frozen: 2 weeks

Reported:
1-8 days

CPT Codes:
82340; 82436; 82507; 84560; 83735; 83945; 84105; 84133; 84300; 84392; 83986
Syphilis Screen by RPR with Reflex to Treponemal Antibody

ORDERING

Performing Lab: Immunology

Performed: Weekdays (day shift)

Methodology: Agglutination

Reported: 1-5 days

Additional Information: RPR is a non-treponemal syphilis test using a cardiolipin substrate. Positive results will automatically be titered and reflex to the Treponemal Antibody Screen (TREPAB) at additional charge. Positive results on both tests provide strong evidence of syphilis. However, false positive tests can be seen in association with autoimmune disease, and cross-reactivity occurs with non-syphilis treponemal infections.

Successful treatment of syphilis is generally indicated by loss of RPR positivity.

Reflex Testing: Yes. If positive, titer and Treponemal Ab will be performed at additional charge.

Synonyms: TPAB, Treponema pallidum, Syphilis, prenatal infection, congenital infection, prenatal screening

COLLECTION

Sample Type: Serum

Collect: Gold top

Amount to Collect: 2 mL blood

Preferred Volume: 1 mL serum

Minimum Volume: 1 mL serum

Remarks: Avoid hemolysis, transport to laboratory as soon as possible. If transport is delayed refrigerate the sample.

Stability (from collection to initiation): Refrigerated, 2 - 8 C: up to 7 days

Frozen, -20 C or colder: 14 days

Storage/Transport Temperature: Refrigerated

Unacceptable Conditions: Grossly lipemic, grossly hemolysed or contaminated samples
Test Code:
   RPRSCR
Test Group:
   Syphilis
Performing Lab:
   Immunology
Preferred Volume:
   1 mL serum
Minimum Volume:
   1 mL serum
Unacceptable Conditions:
   Grossly lipemic, grossly hemolysed or contaminated samples
Stability (from collection to initiation):
   Refrigerated, 2 - 8 C: up to 7 days
   Frozen, -20 C or colder: 14 days
Storage/Transport Temperature:
   Refrigerated

RESULT INTERPRETATION

Reference Interval:
   Non-reactive
Additional Information:
   RPR is a non-treponemal syphilis test using a cardiolipin substrate. Positive results will automatically be titered and reflex to the Treponemal Antibody Screen (TREPAB) at additional charge. Positive results on both tests provide strong evidence of syphilis. However, false positive tests can be seen in association with autoimmune disease, and cross-reactivity occurs with non-syphilis treponemal infections.

   Successful treatment of syphilis is generally indicated by loss of RPR positivity.

ADMINISTRATIVE

CPT Codes:
   86592

COMPLETE VIEW

Test Code:
   RPRSCR
Test Group:
   Syphilis
Performing Lab:
   Immunology
Performed:
   Weekdays (day shift)
Methodology:
   Agglutination
Remarks:
   Avoid hemolysis, transport to laboratory as soon as possible. If transport is delayed refrigerate the sample.
Collect:
   Gold top
Amount to Collect:
   2 mL blood
Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

Unacceptable Conditions:
Grossly lipemic, grossly hemolysed or contaminated samples

Reference Interval:
Non-reactive

Synonyms:
- TPAB
- Treponema pallidum
- Syphilis
- prenatal infection
- congenital infection
- prenatal screening

Storage/Transport Temperature:
Refrigerated

Stability (from collection to initiation):
Refrigerated, 2 - 8 C: up to 7 days
Frozen, -20 C or colder: 14 days

Reported:
1-5 days

Reflex Testing:
Yes. If positive, titer and Treponemal Ab will be performed at additional charge.

Additional Information:
RPR is a non-treponemal syphilis test using a cardiolipin substrate. Positive results will automatically be titered and reflex to the Treponemal Antibody Screen (TREPAB) at additional charge. Positive results on both tests provide strong evidence of syphilis. However, false positive tests can be seen in association with autoimmune disease, and cross-reactivity occurs with non-syphilis treponemal infections.

Successful treatment of syphilis is generally indicated by loss of RPR positivity.

CPT Codes:
86592
T&B Cell Crossmatch - Pronase Treatment (for Donor)
HTTBXFRRP (Sunquest: ILTBPD)

**ORDERING**

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Luminex-based

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**Reflex Testing:**
Yes

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**COLLECTION**

**Sample Type:**
ACD Whole blood

**Collect:**
ACD (Yellow top) x 6

**Amount to Collect:**
51 mL blood

**Preferred Volume:**
51 mL serum

**Minimum Volume:**
Contact ITL

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**PROCESSING**

**Test Code:**
HTTBXFRRP (Sunquest: ILTBPD)

**Test Group:**
HLA Antibody Testing

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
51 mL serum

**Minimum Volume:**
Contact ITL

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

---

**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
86833

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTTBXFRP (Sunquest: ILTBPD)

**Test Group:**
HLA Antibody Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Luminex-based

**Remarks:**

SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

**Collect:**
ACD (Yellow top) x 6

**Amount to Collect:**
51 mL blood

**Sample Type:**
ACD Whole blood

**Preferred Volume:**
51 mL serum

**Minimum Volume:**
Contact ITL

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
• Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**
86833
T&B Cell Crossmatch - Pronase Treatment (for Recipient)
HTTBXFRP (Sunquest: ILTBX)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
3 mL serum
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTTBXFRP (Sunquest: ILTBX)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
3 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

---

**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
86833

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**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTTBXFRP (Sunquest: ILTBPX)

**Test Group:**
HLA Antibody Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Luminex-based

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
Red top

**Amount to Collect:**
6 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
3 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:
86833
T&B Cell Crossmatch by Cytoxicity (for Recipient)
HTTBXCR (Sunquest: ILTBCX)

ORDERING

Available Stat:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Methodology:
Luminex-based

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

Reflex Testing:
Yes

Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
6 mL blood

Preferred Volume:
3 mL serum

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTTBXCR (Sunquest: ILTBCX)

Test Group:
HLA Antibody Testing

Sendout:
Yes

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Preferred Volume:
3 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**ADMINISTRATIVE**

**CPT Codes:**
- 86833

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- HTTBXCR (Sunquest: ILTBCX)

**Test Group:**
- HLA Antibody Testing

**Performing Lab:**
- Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
- Yes

**Methodology:**
- Luminex-based

**Remarks:**
- **SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
- Red top

**Amount to Collect:**
- 6 mL blood

**Sample Type:**
- Serum

**Preferred Volume:**
- 3 mL serum

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Additional Information:

This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:

86833
T&B Cell Crossmatch by Flow Cytometry (for Donor)
HTTBXFR (Sunquest: ILTXFD)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Luminex-based
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing:
Yes
Synonyms:
• Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type:
ACD Whole blood
Collect:
ACD (Yellow top) x 6
Amount to Collect:
51 mL blood
Preferred Volume:
51 mL serum
Minimum Volume:
Contact ITL
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code:
HTTBXFR (Sunquest: ILTXFD)
Test Group:
HLA Antibody Testing
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
51 mL serum

**Minimum Volume:**
Contact ITL

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 72 hours

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**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

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**ADMINISTRATIVE**

**CPT Codes:**
86833

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**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTTBXFR (Sunquest: ILTXFD)

**Test Group:**
HLA Antibody Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Luminex-based

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
ACD (Yellow top) x 6

**Amount to Collect:**
51 mL blood

**Sample Type:**
ACD Whole blood

**Preferred Volume:**
51 mL serum

**Minimum Volume:**
Contact ITL

**Unacceptable Conditions:**
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

Reflex Testing:
Yes

Additional Information:
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

CPT Codes:
86833
T&B Cell Crossmatch by Flow Cytometry (for Recipient)
HTTBXFR (Sunquest: ILTXFR)

ORDERING

Available Stat: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Methodology: Luminex-based
Reported: Test run Monday - Friday. Expected TAT for routine test is < 11 working days.
Additional Information: This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).
Reflex Testing: Yes
Synonyms:
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 6 mL blood
Preferred Volume: 3 mL serum
Remarks:

SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

PROCESSING

Test Code: HTTBXFR (Sunquest: ILTXFR)
Test Group: HLA Antibody Testing
Sendout: Yes
Performing Lab: Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation: Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
3 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**RESULT INTERPRETATION**

**Additional Information:**
This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**ADMINISTRATIVE**

**CPT Codes:**
86833

**COMPLETE VIEW**

**Available Stat:**
Yes

**Test Code:**
HTTBXFR (Sunquest: ILTXFR)

**Test Group:**
HLA Antibody Testing

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Luminex-based

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
Red top

**Amount to Collect:**
6 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
3 mL serum

**Unacceptable Conditions:**
- Hemolyzed sample and or presence of substances that can interfere with the assay (high background).

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- Class II Single Antigen Testing by Luminex, Single Antigen Specificity Class II

**Stability (from collection to initiation):**
- If kept at ambient temperature, can be good for up to 72 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 11 working days.

**Reflex Testing:**
Yes

**Additional Information:**

This test assigns cPRA (calculated PRA) and determines specific Class II antibodies. It is used in both pre-transplant antibody testing and post-transplant monitoring. This test is NOT for evaluation of transfusion-related fever or refractoriness to platelet transfusions (contact Blood Bank, 415-353-1313).

**CPT Codes:**

86833
**T&B-Cell Crossmatch by Flow Cytometry (For Donor)**

**ORDERING**

**Available Stat:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Methodology:**
Cytotoxicity (AHG)

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

**Synonyms:**
- T&B-Cell Crossmatch by Flow

**COLLECTION**

**Sample Type:**
ACD anticoagulated whole blood

**Collect:**
Yellow top (ACD) x6

**Amount to Collect:**
50 mL blood

**Preferred Volume:**
50 mL blood

**Minimum Volume:**
4 mL blood

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours

**Unacceptable Conditions:**
Specimen > 48 hours

**PROCESSING**

**Test Code:**
ILTXFD

**Test Group:**
HLA Crossmatching

**Sendout:**
Yes

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Preferred Volume:**
50 mL blood

**Minimum Volume:**
4 mL blood

**Unacceptable Conditions:**
Specimen > 48 hours

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours

**ADMINISTRATIVE**

CPT Codes:
86825 x2

**COMPLETE VIEW**

Available Stat:
Yes

Test Code:
ILTXFD

Test Group:
HLA Crossmatching

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Cytotoxicity (AHG)

Remarks:

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

Collect:
Yellow top (ACD) x6

Amount to Collect:
50 mL blood

Sample Type:
ACD anticoagulated whole blood

Preferred Volume:
50 mL blood

Minimum Volume:
4 mL blood

Unacceptable Conditions:
Specimen > 48 hours

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- T&B-Cell Crossmatch by Flow

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

CPT Codes:
86825 x2
T&B-Cell Crossmatch by Flow Cytometry (Recipient)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Flow Cytometry
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
Synonyms:
- T&B-Cell Crossmatch by Flow

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample

PROCESSING

Test Code:
ILTXFR
Test Group:
HLA Crossmatching
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum
Unacceptable Conditions:
Hemolyzed sample

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

ADMINISTRATIVE

CPT Codes:
86825 x2

COMPLETE VIEW

Available Stat:
Yes

Test Code:
ILTXFR

Test Group:
HLA Crossmatching

Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)

Sendout:
Yes

Methodology:
Flow Cytometry

Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387

Collect:
Red top

Amount to Collect:
6 mL blood

Sample Type:
Serum

Preferred Volume:
4 mL serum

Minimum Volume:
2 mL serum

Unacceptable Conditions:
Hemolyzed sample

Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:
- T&B-Cell Crossmatch by Flow

Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours

Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

CPT Codes:
86825 x2
T3, Reverse
T3RV

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
LC/MS/MS

**Reported:**
3-5 days

**Additional Information:**
Reverse T3 has limited application. The assay may be useful in the diagnosis of nonthyroidal illness (NTI). Patients with NTI have low T3 concentrations of rT3. RT3 may be useful in neonates to distinguish euthyroid sick syndrome from central hypothyroidism.

This test is performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute. This test should not be used for diagnosis without confirmation by other medically established means.

**Synonyms:**
- Reverse T3
- RT3

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.25 mL serum

**Minimum Volume:**
0.15 mL serum

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 3 weeks, frozen 3 weeks

**PROCESSING**

**Test Code:**
T3RV

**Test Group:**
Thyroid tests

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Freeze serum, ship frozen to China Basin

**Preferred Volume:**
0.25 mL serum

**Minimum Volume:**

Test information subject to change
0.15 mL serum

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 3 weeks, frozen 3 weeks

RESULT INTERPRETATION

Units:
ng/dL

Reference Interval:
Male: 9-28 ng/dL
Female: 7-24 ng/dL

Additional Information:
Reverse T3 has limited application. The assay may be useful in the diagnosis of nonthyroidal illness (NTI). Patients with NTI have low T3 concentrations of rT3. RT3 may be useful in neonates to distinguish euthyroid sick syndrome from central hypothyroidism.

This test is performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute. This test should not be used for diagnosis without confirmation by other medically established means.

ADMINISTRATIVE

CPT Codes:
84482-90

LOINC Codes:
3052-8

COMPLETE VIEW

Available Stat:
No

Test Code:
T3RV

Test Group:
Thyroid tests

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Red top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.25 mL serum

Minimum Volume:
0.15 mL serum

Specimen Preparation:
Freeze serum, ship frozen to China Basin

Units:
ng/dL

Reference Interval:
Male: 9-28 ng/dL
Female: 7-24 ng/dL

**Synonyms:**
- Reverse T3
- RT3

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 3 weeks, frozen 3 weeks

**Reported:**
3-5 days

**Additional Information:**
Reverse T3 has limited application. The assay may be useful in the diagnosis of nonthyroidal illness (NTI). Patients with NTI have low T3 concentrations of rT3. RT3 may be useful in neonates to distinguish euthyroid sick syndrome from central hypothyroidism.

This test is performed using a kit that has not been cleared or approved by the FDA. The analytical performance characteristics of this test have been determined by Quest Diagnostics Nichols Institute. This test should not be used for diagnosis without confirmation by other medically established means.

**CPT Codes:**
84482-90

**LOINC Codes:**
3052-8
T3, Total

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Monday - Saturday (day shift)
Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported: 0 to 2 days
Additional Information: The total T3 level may be elevated in the < 5% of hyperthyroid patients in whom the FT4 level is normal (T3 toxicosis). Measurement of T3 is of no value in the diagnosis of hypothyroidism. Total T3 can be affected by changes in thyroid binding protein levels. Measurements of Free T3 better reflect biologically active hormone levels than measurements of total T3.
Synonyms: • Triiodothyronine

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.25 mL serum or plasma

PROCESSING

Test Code: T3
Test Group: Thyroid tests
Performing Lab: China Basin Chemistry
Specimen Preparation: Refrigerate.
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.25 mL serum or plasma

RESULT INTERPRETATION

Units: nmol/L
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 months</td>
<td>0.9-3.1 nmol/L</td>
<td>1.6-3.5 nmol/L</td>
</tr>
<tr>
<td>1-5 years</td>
<td>1.6-3.1 nmol/L</td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td>1.6-2.8 nmol/L</td>
<td></td>
</tr>
<tr>
<td>11-14 years</td>
<td>1.0-2.9 nmol/L</td>
<td></td>
</tr>
<tr>
<td>15-18 years</td>
<td>1.1-2.7 nmol/L</td>
<td></td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>0.9-2.4 nmol/L</td>
<td></td>
</tr>
</tbody>
</table>

Adult reference ranges adopted from manufacturer reference range studies (95% CI) and verified in-house using blood donor samples (N=124) (excluding autologous donors) on no medications and negative for anti-Tg and TPO antibodies.


Additional Information:

The total T3 level may be elevated in the < 5% of hyperthyroid patients in whom the FT4 level is normal (T3 toxicosis). Measurement of T3 is of no value in the diagnosis of hypothyroidism. Total T3 can be affected by changes in thyroid binding protein levels. Measurements of Free T3 better reflect biologically active hormone levels than measurements of total T3.
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
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<td>0.9-3.1 nmol/L</td>
<td>1.6-3.5 nmol/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male &amp; Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5 years</td>
<td>1.6-3.1 nmol/L</td>
<td></td>
</tr>
<tr>
<td>6-10 years</td>
<td>1.6-2.8 nmol/L</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>&gt;18 years</td>
<td>0.9-2.4 nmol/L</td>
<td></td>
</tr>
</tbody>
</table>

Adult reference ranges adopted from manufacturer reference range studies (95% CI) and verified in-house using blood donor samples (N=124) (excluding autologous donors) on no medications and negative for anti-Tg and TPO antibodies.


Synonyms:
- Triiodothyronine

Reported:
0 to 2 days

Additional Information:
The total T3 level may be elevated in the < 5% of hyperthyroid patients in whom the FT4 level is normal (T3 toxicosis). Measurement of T3 is of no value in the diagnosis of hypothyroidism. Total T3 can be affected by changes in thyroid binding protein levels. Measurements of Free T3 better reflect biologically active hormone levels than measurements of total T3.

CPT Codes:
- 84480

LOINC Codes:
- 3053-6
T4, Total
TT4

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Test run Monday-Friday AM. Results available 1-2 days.
Additional Information:
Conversion: 1 µg/dL = 12.9 nmol/L

Clinical significance: Thyroxine (T4) is the major secretory hormone of the thyroid. Only 0.03% of T4 is unbound and free for exchange with tissues. Thyroid function may be assessed with thyroid stimulating hormone (TSH) and free T4 measured.

Although free T4 is generally preferred over total T4 when monitoring thyroid function, the total T4 measurement may be preferred for monitoring of pregnant patients where total T4 reference ranges are available. The total T4 concentrations tend to be stable throughout pregnancy at 150% of the values in non-pregnant subjects and can be useful when the levels are evaluated according to pregnancy specific total T4 reference ranges which are approx. 1.5 times greater than non-pregnant ranges.


Synonyms:
- thyroxine
- tetraiodothyronine

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Indicate testing is for pregnant patient on requisition.

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 7 days, frozen at -20C 1 month.

PROCESSING

Test Code:
TT4
Test Group:
Thyroid tests
Sendout:
Yes
Performing Lab:
Quest

Specimen Preparation:
Store at room temperature. Order Quest # 17733

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 7 days, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
µg/dL (mcg/dL)

Reference Interval:
1-8 Years  5.9-11.5 mcg/dL
9-13 Years  4.7-10.4 mcg/dL
14-17 Years 5.0-9.8 mcg/dL
>= 18 year old 4.8-10.4 mcg/dL

Pregnancy:
1st Trimester 6.4-15.2 mcg/dL
2nd Trimester 7.4-15.2 mcg/dL
3rd Trimester 7.7-13.8 mcg/dL
All Trimesters Together 7.0-14.7 mcg/dL

Additional Information:
Conversion: 1 µg/dL = 12.9 nmol/L

Clinical significance: Thyroxine (T4) is the major secretory hormone of the thyroid. Only 0.03% of T4 is unbound and free for exchange with tissues. Thyroid function may be assessed with thyroid stimulating hormone (TSH) and free T4 measured.

Although free T4 is generally preferred over total T4 when monitoring thyroid function, the total T4 measurement may be preferred for monitoring of pregnant patients where total T4 reference ranges are available. The total T4 concentrations tend to be stable throughout pregnancy at 150% of the values in non-pregnant subjects and can be useful when the levels are evaluated according to pregnancy specific total T4 reference ranges which are approx. 1.5 times greater than non-pregnant ranges.


ADMINISTRATIVE

CPT Codes:
84436-90

LOINC Codes:
3026-2

COMPLETE VIEW

Available Stat:
No

Test Code:
TT4

Test Group:
Thyroid tests

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Immunoassay

Remarks:
Indicate testing is for pregnant patient on requisition.

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Store at room temperature. Order Quest # 17733

Units:
µg/dL (mcg/dL)

Reference Interval:

<table>
<thead>
<tr>
<th>Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8 Years</td>
<td>5.9-11.5 mcg/dL</td>
</tr>
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</tr>
<tr>
<td>&gt;= 18 year old</td>
<td>4.8-10.4 mcg/dL</td>
</tr>
</tbody>
</table>

Pregnancy:

<table>
<thead>
<tr>
<th>Trimester</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Trimester</td>
<td>6.4-15.2 mcg/dL</td>
</tr>
<tr>
<td>2nd Trimester</td>
<td>7.4-15.2 mcg/dL</td>
</tr>
<tr>
<td>3rd Trimester</td>
<td>7.7-13.8 mcg/dL</td>
</tr>
<tr>
<td>All Trimesters</td>
<td>7.0-14.7 mcg/dL</td>
</tr>
</tbody>
</table>

Synonyms:
- thyroxine
- tetraiodothyronine

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 7 days, frozen at -20C 1 month.

Reported:
Test run Monday-Friday AM. Results available 1-2 days.

Additional Information:
Conversion: 1 µg/dL = 12.9 nmol/L

Clinical significance: Thyroxine (T4) is the major secretory hormone of the thyroid. Only 0.03% of T4 is unbound and free for exchange with tissues. Thyroid function may be assessed with thyroid stimulating hormone (TSH) and free T4 measured.

Although free T4 is generally preferred over total T4 when monitoring thyroid function, the total T4 measurement may be preferred for monitoring of pregnant patients where total T4 reference ranges are available. The total T4 concentrations tend to be stable throughout pregnancy at 150% of the values in non-pregnant subjects and can be useful when the levels are evaluated according to pregnancy specific total T4 reference ranges which are approx. 1.5 times greater than non-pregnant ranges.


CPT Codes:
84436-90

LOINC Codes:
3026-2
Tacrolimus, Trough
TAC

ORDERING

Available Stat:
No
Performing Lab:
    China Basin Chemistry
Performed:
    Daily (day shift)
Methodology:
    Chemiluminescent Immunoassay - Abbott Architect
Reported:
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.
Additional Information:
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
Synonyms:
    • Prograf
    • FK 506
    • FK506
    • Hecoria

COLLECTION

Sample Type:
    EDTA whole blood
Collect:
    Lavender top
Amount to Collect:
    3 mL blood
Preferred Volume:
    3 mL blood
Minimum Volume:
    0.3 mL blood

This volume does not allow for repeat testing if needed.
Remarks:
    Time to steady state: 3 doses
    Collect trough samples no more than 30-60 minutes before AM dose. Samples should not be drawn from any line through which the drug has been infused but only from a peripheral site.
    Specimens must be received in the laboratory by 1200 (Monday-F) or 1000 (Weekends and holidays) for same day results.
Stability (from collection to initiation):
    Refrigerated 1 week.
Unacceptable Conditions:
    Samples collected outside of stated time frames

PROCESSING

Test Code:
    TAC
Performing Lab:
  China Basin Chemistry

Preferred Volume:
  3 mL blood

Minimum Volume:
  0.3 mL blood

  This volume does not allow for repeat testing if needed.

Unacceptable Conditions:
  Samples collected outside of stated time frames

Stability (from collection to initiation):
  Refrigerated 1 week.

RESULT INTERPRETATION

Units:
  µg/L

Reference Interval:
  Therapeutic trough: 5 - 15 µg/L

Additional Information:
  See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
  80197

LOINC Codes:
  11253-2

COMPLETE VIEW

Available Stat:
  No

Test Code:
  TAC

Performing Lab:
  China Basin Chemistry

Performed:
  Daily (day shift)

Methodology:
  Chemiluminescent Immunoassay - Abbott Architect

Remarks:
  Time to steady state: 3 doses

Collect trough samples no more than 30-60 minutes before AM dose. Samples should not be drawn from any line through which the drug has been infused but only from a peripheral site.

Specimens must be received in the laboratory by 1200 (Monday-F) or 1000 (Weekends and holidays) for same day results.

Collect:
  Lavender top

Amount to Collect:
  3 mL blood

Sample Type:
  EDTA whole blood

Preferred Volume:
  3 mL blood
Minimum Volume:
0.3 mL blood

This volume does not allow for repeat testing if needed.

Unacceptable Conditions:
Samples collected outside of stated time frames

Units:
µg/L

Reference Interval:
Therapeutic trough: 5 - 15 µg/L

Synonyms:
- Prograf
- FK 506
- FK506
- Hecoria

Stability (from collection to initiation):
Refrigerated 1 week.

Reported:
For samples received by 1200 (Monday-Friday) and 1000 (weekends and holidays) the results will be available by 1600. Results for samples that miss the cut-off times will be available the following day.

Additional Information:
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
80197

LOINC Codes:
11253-2
Tapeworm Segments
P404

ORDERING

Available Stat:
No
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift
Methodology:
Microscopy
Reported:
1-3 days
Additional Information:
Examination of proglottid segments can reliably identify the infecting species, whereas the eggs of the beef and pork tapeworms are indistinguishable.

See also Taenia solium Antibody.

COLLECTION

Sample Type:
Stool
Collect:
Urine cup or clean container with moistened gauze
Remarks:
Collect 3 samples over 10 days (no more than one per 48 hours) to improve the chance of a positive result. Includes genus, species and stage of intestinal parasite on requisition.

Containers and instructions are available from Specimen Receiving, outpatient phlebotomy, or Microbiology.

Specimens may be collected by colonic aspiration or proctoscopy. Only SAF-preserved specimens should be submitted.

Stability (from collection to initiation):
Refrigerated 24 hours

PROCESSING

Test Code:
P404
Performing Lab:
Microbiology
Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information:
Examination of proglottid segments can reliably identify the infecting species, whereas the eggs of the beef and pork tapeworms are indistinguishable.

See also Taenia solium Antibody.

ADMINISTRATIVE

Printed 06/07/19
Test information subject to change
CPT Codes:
87169
LOINC Codes:
673-4

COMPLETE VIEW

Available Stat:
No
Test Code:
P404
Performing Lab:
Microbiology
Performed:
Monday-Friday, day shift
Methodology:
Microscopy
Remarks:
Collect 3 samples over 10 days (no more than one per 48 hours) to improve the chance of a positive result. Includes genus, species and stage of intestinal parasite on requisition.

Containers and instructions are available from Specimen Receiving, outpatient phlebotomy, or Microbiology.

Specimens may be collected by colonic aspiration or proctoscopy. Only SAF-preserved specimens should be submitted.

Collect:
Urine cup or clean container with moistened gauze
Sample Type:
Stool
Stability (from collection to initiation):
Refrigerated 24 hours
Reported:
1-3 days
Additional Information:
Examination of proglottid segments can reliably identify the infecting species, whereas the eggs of the beef and pork tapeworms are indistinguishable.

See also Taenia solium Antibody.

CPT Codes:
87169
LOINC Codes:
673-4

Printed 06/07/19
Test information subject to change
T-Cell Crossmatch by Cytotoxicity (For Donor)
HTTXCD (Sunquest: ILTXCD)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Cytotoxicity (AHG)
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
Synonyms:
• T-Cell Crossmatch by AHG

COLLECTION

Sample Type:
ACD anticoagulated whole blood
Collect:
Yellow top (ACD) x 6
Amount to Collect:
51 mL blood
Preferred Volume:
51 mL blood
Minimum Volume:
Contact ITL
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS
ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 48 hours
Unacceptable Conditions:
Specimen > 48 hours

PROCESSING

Test Code:
HTTXCD (Sunquest: ILTXCD)
Test Group:
HLA Crossmatching
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
51 mL blood
Minimum Volume:
Contact ITL
Unacceptable Conditions:
Specimen > 48 hours

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours

### ADMINISTRATIVE

**CPT Codes:**
- 86805

### COMPLETE VIEW

**Available Stat:**
Yes

**Test Code:**
HTTXCD (Sunquest: ILTXCD)

**Test Group:**
HLA Crossmatching

**Performing Lab:**
Immunogenetics & Transplantation Laboratory (ITL)

**Sendout:**
Yes

**Methodology:**
Cytotoxicity (AHG)

**Remarks:**

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

**Collect:**
Yellow top (ACD) x 6

**Amount to Collect:**
51 mL blood

**Sample Type:**
ACD anticoagulated whole blood

**Preferred Volume:**
51 mL blood

**Minimum Volume:**
Contact ITL

**Unacceptable Conditions:**
Specimen > 48 hours

**Specimen Preparation:**
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

**Synonyms:**
- T-Cell Crossmatch by AHG

**Stability (from collection to initiation):**
If kept at ambient temperature, can be good for up to 48 hours

**Reported:**
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

**CPT Codes:**
- 86805
T-Cell Crossmatch by Cytotoxicity w/ DTT (Recipient)

ORDERING

Available Stat:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Methodology:
Cytotoxicity
Reported:
Test run Monday - Friday. Expected TAT for routine test is < 5 working days.
Synonyms:
- T-Cell Crossmatch by AHG - DTT Treated

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
6 mL blood
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum
Remarks:
SAMPLE COLLECTION GUIDE FOR ITL TESTS

ITL (415) 476-3387
Stability (from collection to initiation):
If kept at ambient temperature, can be good for up to 72 hours
Unacceptable Conditions:
Hemolyzed sample

PROCESSING

Test Code:
ILTXDT
Test Group:
HLA Crossmatching
Sendout:
Yes
Performing Lab:
Immunogenetics & Transplantation Laboratory (ITL)
Specimen Preparation:
Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.
Preferred Volume:
4 mL serum
Minimum Volume:
2 mL serum
Unacceptable Conditions:
Hemolyzed sample

**Stability (from collection to initiation):**

If kept at ambient temperature, can be good for up to 72 hours

---

**ADMINISTRATIVE**

CPT Codes:

- 86805

---

**COMPLETE VIEW**

Available Stat:

- Yes

Test Code:

- ILTXDT

Test Group:

- HLA Crossmatching

Performing Lab:

- Immunogenetics & Transplantation Laboratory (ITL)

Sendout:

- Yes

Methodology:

- Cytotoxicity

Remarks:

**SAMPLE COLLECTION GUIDE FOR ITL TESTS**

ITL (415) 476-3387

Collect:

- Red top

Amount to Collect:

- 6 mL blood

Sample Type:

- Serum

Preferred Volume:

- 4 mL serum

Minimum Volume:

- 2 mL serum

Unacceptable Conditions:

- Hemolyzed sample

Specimen Preparation:

- Keep sample at Room Temperature, DO NOT refrigerate or centrifuge.

Synonyms:

- T-Cell Crossmatch by AHG - DTT Treated

Stability (from collection to initiation):

If kept at ambient temperature, can be good for up to 72 hours

Reported:

- Test run Monday - Friday. Expected TAT for routine test is < 5 working days.

CPT Codes:

- 86805
T-Cell Receptor Beta Gene Rearrangement
TCRB

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: PCR
Reported: 5 - 7 days

Additional Information:
This assay which interrogates the T-cell receptor beta locus (TCRB) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with T-cell receptor (TCR) gamma PCR assay (Test code 90509), since false-negative results can occur in up to 5-10% of T-cell malignancies with TCRB PCR alone.

Synonyms:
- TCR Beta
- T-cell clonality

COLLECTION

Sample Type: Whole blood, bone marrow
Collect: Lavender top
Amount to Collect: See preferred volume.
Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL
Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

PROCESSING

Test Code: TCRB
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
Do not aliquot or freeze. Store ambient and transport to CB. Order Quest test code 91446.
Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL
Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

RESULT INTERPRETATION
Additional Information:

This assay which interrogates the T-cell receptor beta locus (TCRB) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with T-cell receptor (TCR) gamma PCR assay (Test code 90509), since false-negative results can occur in up to 5-10% of T-cell malignancies with TCRB PCR alone.

CPT Codes:
81340-90, 84999-90

Complete View

Available Stat:
No

Test Code:
TCRB

Performing Lab:
Quest

Sendout:
Yes

Methodology:
PCR

Collect:
Lavender top

Amount to Collect:
See preferred volume.

Sample Type:
Whole blood, bone marrow

Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL

Specimen Preparation:
Do not aliquot or freeze. Store ambient and transport to CB. Order Quest test code 91446.

Synonyms:
- TCR Beta
- T-cell clonality

Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

Reported:
5 - 7 days

Additional Information:
This assay which interrogates the T-cell receptor beta locus (TCRB) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with T-cell receptor (TCR) gamma PCR assay (Test code 90509), since false-negative results can occur in up to 5-10% of T-cell malignancies with TCRB PCR alone.

CPT Codes:
81340-90, 84999-90
T-Cell Receptor Gamma Gene Rearrangement
TCRG

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
PCR
Reported:
5 - 7 days
Additional Information:
This assay which interrogates the T-cell receptor gamma locus (TCRG) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with the T-cell receptor beta (TCRB) PCR assay (Test code 91446) since false-negative results can occur in up to 5-10% of T-cell malignancies when testing for TCRG PCR only.

Synonyms:
- TCR Gamma
- T-cell clonality

COLLECTION

Sample Type:
Whole blood, bone marrow
Collect:
Lavender top
Amount to Collect:
See preferred volume.
Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL
Minimum Volume:
Whole blood: 3 mL
Marrow: 0.5 mL
Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

PROCESSING

Test Code:
TCRG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do not aliquot or freeze. Store ambient and transport to CB. Order Quest test code 90509.
Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL
Minimum Volume:
Whole blood: 3 mL
Marrow: 0.5 mL

Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

RESULT INTERPRETATION

Additional Information:
This assay which interrogates the T-cell receptor gamma locus (TCRG) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with the T-cell receptor beta (TCRB) PCR assay (Test code 91446) since false-negative results can occur in up to 5-10% of T-cell malignancies when testing for TCRG PCR only.

ADMINISTRATIVE

CPT Codes:
81342-90, 84999-90

COMPLETE VIEW

Available Stat:
No

Test Code:
TCRG

Performing Lab:
Quest

Sendout:
Yes

Methodology:
PCR

Collect:
Lavender top

Amount to Collect:
See preferred volume.

Sample Type:
Whole blood, bone marrow

Preferred Volume:
Whole blood: 5 mL
Marrow: 1 mL

Minimum Volume:
Whole blood: 3 mL
Marrow: 0.5 mL

Specimen Preparation:
Do not aliquot or freeze. Store ambient and transport to CB. Order Quest test code 90509.

Synonyms:
- TCR Gamma
- T-cell clonality

Stability (from collection to initiation):
Room temperature 1 week, Refrigerated 1 week.

Reported:
5 - 7 days

Additional Information:
This assay which interrogates the T-cell receptor gamma locus (TCRG) by a PCR method based on the BIOMED-2 consensus, is useful for establishing clonality of T-cell lymphoid neoplasms and identification of minimal residual disease or early recurrence in patients with a previous diagnosis of a T-cell neoplasm. It can be used in association with the T-cell receptor beta (TCRB) PCR assay (Test code 91446) since false-negative results can occur in up to 5-10% of T-cell malignancies when testing for TCRG PCR only.
CPT Codes:
81342-90, 84999-90
T-cell Subsets, Regulatory
TREGS

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Flow cytometry
Additional Information:
Used in evaluating patients with clinical features of IPEX (immune dysregulation, polyendocrinopathy, enteropathy, X-linked inheritance) and other primary immunodeficiencies, autoimmune diseases, allergy and asthma, and graft-vs-host disease post-hematopoietic stem cell transplantation
Synonyms:
• Tregs
• T-reg

COLLECTION

Sample Type:
EDTA Whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood
Remarks:
Collect samples Monday - Thursday only, Do not collect, Friday, weekends or holidays.
Requires a separate lavender top be collected.
Unacceptable Conditions:
Gross hemolysis or lipemia
Rejection Criteria:
Gross hemolysis or lipemia

PROCESSING

Test Code:
TREGS
Sendout:
Yes
Performing Lab:
Mayo
Specimen Preparation:
Send specimen in original tube. Do not aliquot.
Send specimen Monday through Thursday only. Specimen must arrive at Mayo within 24 hours of draw and by 10 a.m. on Friday.
Draw and package specimen as close to shipping time as possible. Ship specimen overnight. Order MML test code TREGS.
Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Unacceptable Conditions:
- Gross hemolysis or lipemia

Rejection Criteria:
- Gross hemolysis or lipemia

RESULT INTERPRETATION

Additional Information:
Used in evaluating patients with clinical features of IPEX (immune dysregulation, polyendocrinopathy, enteropathy, X-linked inheritance) and other primary immunodeficiencies, autoimmune diseases, allergy and asthma, and graft-vs-host disease post-hematopoietic stem cell transplantation

ADMINISTRATIVE

CPT Codes:
86359-90, 86361-90

COMPLETE VIEW

Available Stat:
No

Test Code:
TREGS

Performing Lab:
Mayo

Sendout:
Yes

Methodology:
Flow cytometry

Remarks:
Collect samples Monday - Thursday only, Do not collect, Friday, weekends or holidays.

Requires a separate lavender top be collected.

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA Whole blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Rejection Criteria:
Gross hemolysis or lipemia

Unacceptable Conditions:
Gross hemolysis or lipemia

Specimen Preparation:
Send specimen in original tube. Do not aliquot.

Send specimen Monday through Thursday only. Specimen must arrive at Mayo within 24 hours of draw and by 10 a.m. on Friday.
Draw and package specimen as close to shipping time as possible. Ship specimen overnight. Order MML test code TREGS.

**Synonyms:**
- Tregs
- T-regs

**Additional Information:**
Used in evaluating patients with clinical features of IPEX (immune dysregulation, polyendocrinopathy, enteropathy, X-linked inheritance) and other primary immunodeficiencies, autoimmune diseases, allergy and asthma, and graft-vs-host disease post-hematopoietic stem cell transplantation

**CPT Codes:**
86359-90, 86361-90
TCR Alpha Beta/CD19 Depletion by Clinimacs

TCRDEP

ORDERING

Performing Lab:
Pediatric Cellular Therapy Laboratory (PTCL)

Performed:
PROCESSING PERFORMED MONDAY - FRIDAY. NO HOLIDAYS & WEEKENDS. MUST MAKE PRIOR ARRANGEMENT WITH THE LABORATORY.

Methodology:
CLINIMACS PLUS OR CLINIMACS PRODIGY

COLLECTION

Sample Type:
HPC, APHERESIS, HPC, MARROW

Collect:
APHERESIS COLLECTION BAG, MARROW COLLECTION BAG

Remarks:
CONTACT PEDIATRIC APHERESIS DEPARTMENT OR PEDIATRIC INFUSION CENTER OR PARNASSUS INFUSION CENTER

Stability (from collection to initiation):
CELLS MUST BE PROCESSED WITHIN 24 HOURS AFTER COLLECTION

Storage/Transport Temperature:
HPC, APHERESIS MUST BE STORED AT TEMPERATURE BETWEEN 2 TO 8 DEG C & HPC, MARROW MUST BE STORED AT ROOM TEMPERATURE

Unacceptable Conditions:
PLEASE CALL PCTL AT 6-4860

PROCESSING

Test Code:
TCRDEP

Performing Lab:
Pediatric Cellular Therapy Laboratory (PTCL)

Unacceptable Conditions:
PLEASE CALL PCTL AT 6-4860

Stability (from collection to initiation):
CELLS MUST BE PROCESSED WITHIN 24 HOURS AFTER COLLECTION

Storage/Transport Temperature:
HPC, APHERESIS MUST BE STORED AT TEMPERATURE BETWEEN 2 TO 8 DEG C & HPC, MARROW MUST BE STORED AT ROOM TEMPERATURE

RESULT INTERPRETATION

Units:
%, x 10 e6 / kg, x 10 e4 / kg

Interpretive Data:
THIS IS A HIGH COMPLEXITY TESTING AND PROCRESSING THAT NEEDS PRIOR ARRANGEMENT WITH PCTL. CONTACT ATTENDING MD FOR DOSING GUIDELINES.

CPT Codes:
COMPLETE VIEW

Test Code: TCRDEP
Performing Lab: Pediatric Cellular Therapy Laboratory (PTCL)
Performed: PROCESSING PERFORMED MONDAY - FRIDAY. NO HOLIDAYS & WEEKENDS. MUST MAKE PRIOR ARRANGEMENT WITH THE LABORATORY.
Methodology: CLINIMACS PLUS OR CLINIMACS PRODIGY
Remarks: CONTACT PEDIATRIC APHERESIS DEPARTMENT OR PEDIATRIC INFUSION CENTER OR PARNASSUS INFUSION CENTER
Collect: APHERESIS COLLECTION BAG, MARROW COLLECTION BAG
Sample Type: HPC, APHERESIS, HPC, MARROW
Unacceptable Conditions: PLEASE CALL PCTL AT 6-4860
Units: %, x 10 e6 / kg, x 10 e4 / kg
Interpretive Data: THIS IS A HIGH COMPLEXITY TESTING AND PROCCESSING THAT NEEDS PRIOR ARRANGEMENT WITH PCTL. CONTACT ATTENDING MD FOR DOSING GUIDELINES.
Storage/Transport Temperature: HPC, APHERESIS MUST BE STORED AT TEMPERATURE BETWEEN 2 TO 8 DEG C & HPC, MARROW MUST BE STORED AT ROOM TEMPERATURE
Stability (from collection to initiation): CELLS MUST BE PROCESSED WITHIN 24 HOURS AFTER COLLECTION
CPT Codes: 38210
**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Immunology

**Performed:**
Monday-sat (day shift)

**Reported:**
1-2 days

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**Synonyms:**
- Terminal deoxynucleotidyl Transferase

**COLLECTION**

**Sample Type:**
EDTA whole blood, Bone marrow, Unfixed tissue

**Collect:**
Lavender top

**Amount to Collect:**
3 mL blood

**Preferred Volume:**
Specimen amount varies-contact Immunology at x3-1712.

**PROCESSING**

**Test Code:**
TDT

**Performing Lab:**
Immunology

**Specimen Preparation:**
Hold bone marrow and blood specimens at room temperature. Do NOT centrifuge.

Refrigerate fine needle aspirates in special holding medium.

Each specimen should be assigned its own accession number.

If specimens are delivered to Specimen Receiving, contact Immunology immediately. If a specimen arrives after 1700 hours Monday-Friday, hold it at room temperature for delivery to Immunology after 0800 hours the following morning. After 1700 hours on Saturday, on Sunday or on a holiday contact the resident on call.

If a glass slide is received with an FNA sample, label it with an accession number label and send it with the sample to CB for testing.

**Preferred Volume:**
Specimen amount varies-contact Immunology at x3-1712.

**RESULT INTERPRETATION**

**Reference Interval:**
Negative

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

**ADMINISTRATIVE**

CPT Codes:
- 88346

LDT or Modified FDA:
- Yes

LOINC Codes:
- 30117-6

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- TDT

Performing Lab:
- Immunology

Performed:
- Monday-sat (day shift)

Collect:
- Lavender top

Amount to Collect:
- 3 mL blood

Sample Type:
- EDTA whole blood, Bone marrow, Unfixed tissue

Preferred Volume:
- Specimen amount varies-contact Immunology at x3-1712.

Specimen Preparation:
- Hold bone marrow and blood specimens at room temperature. Do NOT centrifuge.

- Refrigerate fine needle aspirates in special holding medium.

- Each specimen should be assigned its own accession number.

If specimens are delivered to Specimen Receiving, contact Immunology immediately. If a specimen arrives after 1700 hours Monday-Friday, hold it at room temperature for delivery to Immunology after 0800 hours the following morning. After 1700 hours on Saturday, on Sunday or on a holiday contact the resident on call.

If a glass slide is received with an FNA sample, label it with an accession number label and send it with the sample to CB for testing.

Reference Interval:
- Negative

Synonyms:
- Terminal deoxynucleotidyl Transferase

Reported:
- 1-2 days

Additional Information:
- An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

CPT Codes:
- 88346

LDT or Modified FDA:
- Yes

LOINC Codes:
- 30117-6
TEG

ORDERING

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.
Performing Lab:
Mission Bay Hematology
Performed:
By appointment only, 0800-1530 daily
Reported:
2 hours
Additional Information:
If patient is on a Heparinized line at the time of draw, please order a HEPTEG.
Synonyms:
- Thromboelastograph

COLLECTION

Sample Type:
Citrated Whole Blood
Collect:
Citrated Blue Top
Amount to Collect:
2.7 mL
Preferred Volume:
2.7 mL
Minimum Volume:
2.7 mL
Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology laboratory.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

PROCESSING

Test Code:
TEG
Performing Lab:
Mission Bay Hematology
Preferred Volume:
2.7 mL
Minimum Volume:
2.7 mL

Unacceptable Conditions:
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

Stability (from collection to initiation):
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

RESULT INTERPRETATION

Units:
R (min)  K (min)  Angle (deg)  MA (mm)

Reference Interval:
ADULT NORMAL VALUES:  TEG

<table>
<thead>
<tr>
<th>R (min)</th>
<th>K (min)</th>
<th>Angle (deg)</th>
<th>MA (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0-10.4</td>
<td>0.8-2.8</td>
<td>55.2-78.4</td>
<td>50.6-69.4</td>
</tr>
</tbody>
</table>

The thrombelastograph has been cleared by the U.S. FDA as a medical device indicated for use with adult patients where an evaluation of their blood coagulation properties is desired. The use of TEG in pediatric patients has not been cleared by the FDA. The performance characteristics of the test were assessed by the UCSF Clinical Laboratories.

Additional Information:
If patient is on a Heparinized line at the time of draw, please order a HEPTEG.

ADMINISTRATIVE

CPT Codes:
85347, 85384, 85576, 85390

LOINC Codes:
67790-6

COMPLETE VIEW

Approval Required:
By appointment only, contact Mission Bay Hematology at x-60194.

Test Code:
TEG

Performing Lab:
Mission Bay Hematology

Performed:
By appointment only, 0800-1530 daily

Remarks:
By appointment only, contact Mission Bay Hematology at x-60194.

1. Use a 21G needle to perform the venipuncture.
2. Draw and discard the first 3 mL of blood or fill another tube. Blue top cannot be the first tube drawn.
3. After collection, mix each tube by gently inverting 3 to 4 times.
4. Discard the sample if there is a venous collapse or stoppage of blood flow during collection. Likewise, avoid prolonged placement of the tourniquet or a traumatic phlebotomy.
5. Sample should be hand delivered immediately to the Hematology laboratory.

Collect:
Citrated Blue Top

Amount to Collect:
2.7 mL

Sample Type:
Citrated Whole Blood
Preferred Volume:  
2.7 mL

Minimum Volume:  
2.7 mL

Unacceptable Conditions:  
Unapproved orders, sample past stability time, tubed samples, samples from a traumatic phlebotomy, over or under filled tubes.

Units:  
R (min)  K (min)  Angle (deg)  MA (mm)

Reference Interval:  
ADULT NORMAL VALUES: TEG

<table>
<thead>
<tr>
<th>R (min)</th>
<th>K (min)</th>
<th>Angle (deg)</th>
<th>MA (mm)</th>
</tr>
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The thrombelastograph has been cleared by the U.S. FDA as a medical device indicated for use with adult patients where an evaluation of their blood coagulation properties is desired. The use of TEG in pediatric patients has not been cleared by the FDA. The performance characteristics of the test were assessed by the UCSF Clinical Laboratories.

Synonyms:  
- Thromboelastograph

Stability (from collection to initiation):  
Room Temperature, hand deliver immediately to Hematology Laboratory within 30 minutes of collection.

Reported:  
2 hours

Additional Information:  
If patient is on a Heparinized line at the time of draw, please order a HEPTEG.

CPT Codes:  
85347, 85384, 85576, 85390

LOINC Codes:  
67790-6
Testosterone, Free (includes Total Testosterone), Adult
FTCA

ORDERING

Performing Lab: China Basin Chemistry
Performed: Sunday and Wednesday (day shift)
Methodology: Total Testosterone (Chemiluminescent Microparticle Immunoassay - Abbott Architect i2000), Free Testosterone calculation
Reported: Test run on Sunday and Wednesday. Turnaround time 1-5 days
Additional Information: Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.
Includes determination of total testosterone.
Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.
Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.
Synonyms: Free testosterone

COLLECTION

Sample Type: Serum
Collect: Red top
Amount to Collect: 2 mL (blood)
Preferred Volume: 1 mL (serum)
Minimum Volume: 0.75 mL (serum)
Stability (from collection to initiation):
Refrigerated (2-8°C): 2 weeks
Frozen at (-20°C): 3 years
Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

PROCESSING

Test Code: FTCA
Test Group: Testosterone
Performing Lab: China Basin Chemistry
Specimen Preparation: Refrigerate serum.
Preferred Volume: 1 mL (serum)
Minimum Volume:
0.75 mL (serum)

Stability (from collection to initiation):
Refrigerated (2-8°C): 2 weeks
Frozen at (-20°C): 3 years

Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

RESULT INTERPRETATION

Units:
pg/mL (free) and ng/dL (total)

Reference Interval:
Testosterone, Total:
Males >= 18 years  240-871 ng/dL
Females >= 18 years 9-55 ng/dL

Testosterone, Free:
Age   Males   Females
18-69 years 35-155 pg/mL 0.1-6.4 pg/mL
70-89 years 30-135 pg/mL 0.2-3.7 pg/mL

Additional Information:
Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.

Includes determination of total testosterone.

Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.

Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

ADMINISTRATIVE

CPT Codes:
84402 and 84403

LOINC Codes:
2991-8 and 2986-8

COMPLETE VIEW

Test Code:
FTCA

Test Group:
Testosterone

Performing Lab:
China Basin Chemistry

Performed:
Sunday and Wednesday (day shift)

Methodology:
Total Testosterone (Chemiluminescent Microparticle Immunoassay - Abbott Architect i2000), Free Testosterone calculation

Collect:
Red top

Amount to Collect:
2 mL (blood)

Sample Type:
Serum
Preferred Volume:  
1 mL (serum)

Minimum Volume:  
0.75 mL (serum)

Specimen Preparation:  
Refrigerate serum.

Units:  
pg/mL (free) and ng/dL (total)

Reference Interval:
Testosterone, Total:
Males >= 18 years  240-871 ng/dL  
Females >= 18 years 9-55 ng/dL

Testosterone, Free:
Age    Males    Females
18-69 years 35-155 pg/mL 0.1-6.4 pg/mL
70-89 years 30-135 pg/mL 0.2-3.7 pg/mL

Synonyms:  
• Free testosterone

Stability (from collection to initiation):  
Refrigerated (2-8°C): 2 weeks  
Frozen at (-20°C): 3 years

Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

Reported:  
Test run on Sunday and Wednesday. Turnaround time 1-5 days

Additional Information:  
Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.

Includes determination of total testosterone.

Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.

Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

CPT Codes:  
84402 and 84403

LOINC Codes:  
2991-8 and 2986-8
Testosterone, Free (includes Total Testosterone), Pediatric
FTCP

ORDERING

Approval Required:
Yes, contact Chemistry/Immunology Resident at 415-353-1438 for patients > 20 years old.

Performing Lab:
China Basin Chemistry

Performed:
Wednesday (day shift)

Methodology:
Total testosterone by LC-MS/MS, free testosterone by calculation

Reported:
Test run once per week (Wednesday). Turnaround time 2-8 days

Additional Information:
Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.

Includes determination of total testosterone.

Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.

Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

Synonyms:
• Free testosterone

COLLECTION

Sample Type:
Serum

Collect:
Red top

Amount to Collect:
2 mL (blood)

Preferred Volume:
1 mL (serum)

Minimum Volume:
0.75 mL (serum)

Stability (from collection to initiation):
Refrigerated (2-8°C): 2 weeks
Frozen at (-20°C): 3 years

Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

PROCESSING

Test Code:
FTCP

Test Group:
Testosterone

Performing Lab:
China Basin Chemistry

Specimen Preparation:
Refrigerate serum.
Preferred Volume:
1 mL (serum)

Minimum Volume:
0.75 mL (serum)

Stability (from collection to initiation):
Refrigerated (2-8°C): 2 weeks
Frozen at (-20°C): 3 years

Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

RESULT INTERPRETATION

Units:
pg/mL (free) and ng/dL (total)

Reference Interval:

Testosterone, Total:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature (26-28 weeks)</td>
<td>59-125 ng/dL</td>
<td>5-16 ng/dL</td>
</tr>
<tr>
<td>Premature (31-35 weeks)</td>
<td>37-198 ng/dL</td>
<td>5-22 ng/dL</td>
</tr>
<tr>
<td>Newborn</td>
<td>75-400 ng/dL</td>
<td>20-64 ng/dL</td>
</tr>
<tr>
<td>1-5 months</td>
<td>14-363 ng/dL</td>
<td>&lt;20 ng/dL</td>
</tr>
<tr>
<td>6-24 months</td>
<td>&lt;37 ng/dL</td>
<td>&lt;9 ng/dL</td>
</tr>
<tr>
<td>2-3 years</td>
<td>&lt;15 ng/dL</td>
<td>&lt;20 ng/dL</td>
</tr>
<tr>
<td>4-5 years</td>
<td>&lt;19 ng/dL</td>
<td>&lt;30 ng/dL</td>
</tr>
<tr>
<td>6-7 years</td>
<td>&lt;13 ng/dL</td>
<td>&lt;7 ng/dL</td>
</tr>
<tr>
<td>8-9 years</td>
<td>2-8 ng/dL</td>
<td>1-11 ng/dL</td>
</tr>
<tr>
<td>10-11 years</td>
<td>2-165 ng/dL</td>
<td>3-32 ng/dL</td>
</tr>
<tr>
<td>12-13 years</td>
<td>3-619 ng/dL</td>
<td>6-50 ng/dL</td>
</tr>
<tr>
<td>14-15 years</td>
<td>31-733 ng/dL</td>
<td>6-52 ng/dL</td>
</tr>
<tr>
<td>16-17 years</td>
<td>158-826 ng/dL</td>
<td>9-58 ng/dL</td>
</tr>
<tr>
<td>18-39 years</td>
<td>300-1080 ng/dL</td>
<td>9-55 ng/dL</td>
</tr>
</tbody>
</table>

Testosterone, Free:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 -9.9 years</td>
<td>&lt;= 5.3 pg/mL</td>
<td>0.2-5.0 pg/mL</td>
</tr>
<tr>
<td>10-13.9 years</td>
<td>0.7-52.0 pg/mL</td>
<td>0.1-7.4 pg/mL</td>
</tr>
<tr>
<td>14-17.9 years</td>
<td>18-111 pg/mL</td>
<td>0.5-3.9 pg/mL</td>
</tr>
<tr>
<td>18-69 years</td>
<td>35-155 pg/mL</td>
<td>0.1-6.4 pg/mL</td>
</tr>
</tbody>
</table>

Additional Information:

Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.

Includes determination of total testosterone.

Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.

Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.
CPT Codes:
84402 and 84403

LOINC Codes:
2991-8 and 2986-8

COMPLETE VIEW

Approval Required:
Yes, contact Chemistry/Immunology Resident at 415-353-1438 for patients > 20 years old.

Test Code:
FTCP

Test Group:
Testosterone

Performing Lab:
China Basin Chemistry

Performed:
Wednesday (day shift)

Methodology:
Total testosterone by LC-MS/MS, free testosterone by calculation

Collect:
Red top

Amount to Collect:
2 mL (blood)

Sample Type:
Serum

Preferred Volume:
1 mL (serum)

Minimum Volume:
0.75 mL (serum)

Specimen Preparation:
Refrigerate serum.

Units:
pg/mL (free) and ng/dL (total)

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Total Testosterone, Males (ng/dL)</th>
<th>Total Testosterone, Females (ng/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature (26-28 weeks)</td>
<td>59-125</td>
<td>5-16</td>
</tr>
<tr>
<td>Premature (31-35 weeks)</td>
<td>37-198</td>
<td>5-22</td>
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<td>&lt;20</td>
</tr>
<tr>
<td>4-5 years</td>
<td>&lt;19</td>
<td>&lt;30</td>
</tr>
<tr>
<td>6-7 years</td>
<td>&lt;13</td>
<td>&lt;7</td>
</tr>
<tr>
<td>8-9 years</td>
<td>2-8</td>
<td>1-11</td>
</tr>
<tr>
<td>10-11 years</td>
<td>2-165</td>
<td>3-32</td>
</tr>
<tr>
<td>12-13 years</td>
<td>3-619</td>
<td>6-50</td>
</tr>
<tr>
<td>14-15 years</td>
<td>31-733</td>
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</tr>
<tr>
<td>18-39 years</td>
<td>300-1080</td>
<td>9-55</td>
</tr>
</tbody>
</table>

Total testosterone reference ranges by pubertal stage:

<table>
<thead>
<tr>
<th>Tanner Stage</th>
<th>Males (ng/dL)</th>
<th>Females (ng/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanner Stage I</td>
<td>2-15</td>
<td>2-17</td>
</tr>
<tr>
<td>Tanner Stage II</td>
<td>3-303</td>
<td>5-40</td>
</tr>
</tbody>
</table>

Printed 06/07/19
Test information subject to change
Testosterone, Free:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 9.9 years</td>
<td>&lt;= 5.3 pg/mL</td>
<td>0.2 - 2.5 pg/mL</td>
</tr>
<tr>
<td>10 - 13.9 years</td>
<td>0.7 - 52.0 pg/mL</td>
<td>0.1 - 7.4 pg/mL</td>
</tr>
<tr>
<td>14 - 17.9 years</td>
<td>18 - 111 pg/mL</td>
<td>0.5 - 3.9 pg/mL</td>
</tr>
<tr>
<td>18 - 69 years</td>
<td>35 - 155 pg/mL</td>
<td>0.1 - 6.4 pg/mL</td>
</tr>
</tbody>
</table>

Synonyms:
- Free testosterone

Stability (from collection to initiation):
- Refrigerated (2-8°C): 2 weeks
- Frozen at (-20°C): 3 years

Serum is stable on the clot up to 24 hours refrigerated (2-8°C).

Reported:
- Test run once per week (Wednesday). Turnaround time 2-8 days

Additional Information:
- Reference ranges adopted from Quest Diagnostics based on correlation studies comparing our method with the Quest method and by in-house testing of 24 normal male and 31 normal female volunteers in the UCSF Laboratory.

Includes determination of total testosterone.

Free: To convert pg/mL to pmol/L (SI units) multiply by 3.467.

Total: To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

CPT Codes:
- 84402 and 84403

LOINC Codes:
- 2991-8 and 2986-8

Tanner Stage III 10-851 ng/dL 10-63 ng/dL
Tanner Stage IV-V 162-847 ng/dL 11-62 ng/dL
**Testosterone, Total, Pediatric**

**PTES**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
China Basin Chemistry

**Performed:**
Set up Wednesday, reports next day

**Methodology:**
LC/MS/MS

**Reported:**
Test run once per week. Turnaround time 2-8 days

**Additional Information:**
This assay is primarily intended for testing in pediatric patients with suspected or complex endocrine abnormalities or in settings where very low levels of testosterone are expected. For routine testing in adult patients, order "Testosterone" (test code TTES).

Testing may be helpful in assessing testicular function in males and managing hirsutism, virilization in females. Measurement of testosterone by LC/MS/MS overcomes interferences and the known limitations of direct immunoassays in measurement of testosterone values in the lower range. These advantages are particularly relevant for assessment of testosterone in women, children/infants, and men on testosterone reduction therapy for prostate cancer.

Reference ranges adapted from ARUP Laboratories (Clin Chem 2010; 56(7):1138-1147) based on patient correlation studies comparing this LC/MSMS method with the ARUP method and by in-house testing of 20 normal male and 20 normal female volunteers in the UCSF Chemistry laboratory at China Basin.

**Synonyms:**
- Testosterone ultrasensitive

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Stability (from collection to initiation):**
- Refrigerated serum on cells: 3 days
- Refrigerated serum: 2 weeks
- Frozen serum: 3 years

**PROCESSING**

**Test Code:**
PTES

**Test Group:**
Testosterone

**Performing Lab:**
China Basin Chemistry
Specimen Preparation:
- Centrifuge samples aliquot serum and refrigerate

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Stability (from collection to initiation):
- Refrigerated serum on cells: 3 days
- Refrigerated serum: 2 weeks
- Frozen serum: 3 years

RESULT INTERPRETATION

Units:
- ng/dL

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature (26-28 weeks)</td>
<td>59-125 ng/dL</td>
<td>5-16 ng/dL</td>
</tr>
<tr>
<td>Premature (31-35 weeks)</td>
<td>37-198 ng/dL</td>
<td>5-22 ng/dL</td>
</tr>
<tr>
<td>Newborn</td>
<td>75-400 ng/dL</td>
<td>20-64 ng/dL</td>
</tr>
<tr>
<td>1-5 months</td>
<td>14-363 ng/dL</td>
<td>&lt;20 ng/dL</td>
</tr>
<tr>
<td>6-24 months</td>
<td>&lt;37 ng/dL</td>
<td>&lt;9 ng/dL</td>
</tr>
<tr>
<td>2-3 years</td>
<td>&lt;15 ng/dL</td>
<td>&lt;20 ng/dL</td>
</tr>
<tr>
<td>4-5 years</td>
<td>&lt;19 ng/dL</td>
<td>&lt;30 ng/dL</td>
</tr>
<tr>
<td>6-7 years</td>
<td>&lt;13 ng/dL</td>
<td>&lt;7 ng/dL</td>
</tr>
<tr>
<td>8-9 years</td>
<td>2-8 ng/dL</td>
<td>1-11 ng/dL</td>
</tr>
<tr>
<td>10-11 years</td>
<td>2-165 ng/dL</td>
<td>3-32 ng/dL</td>
</tr>
<tr>
<td>12-13 years</td>
<td>3-619 ng/dL</td>
<td>6-50 ng/dL</td>
</tr>
<tr>
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<td>31-733 ng/dL</td>
<td>6-52 ng/dL</td>
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<tr>
<td>16-17 years</td>
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<td>9-58 ng/dL</td>
</tr>
<tr>
<td>18-39 years</td>
<td>300-1080 ng/dL</td>
<td>9-55 ng/dL</td>
</tr>
<tr>
<td>40-59 years</td>
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<td>9-55 ng/dL</td>
</tr>
<tr>
<td>60 years and older</td>
<td>300-720 ng/dL</td>
<td>5-32 ng/dL</td>
</tr>
</tbody>
</table>

Tanner Stage                      | Males            | Females          |
| Tanner Stage I                  | 2-15 ng/dL       | 2-17 ng/dL       |
| Tanner Stage II                 | 3-303 ng/dL      | 5-40 ng/dL       |
| Tanner Stage III                | 10-851 ng/dL     | 10-63 ng/dL      |
| Tanner Stage IV-V               | 162-847 ng/dL    | 11-62 ng/dL      |

Additional Information:
This assay is primarily intended for testing in pediatric patients with suspected or complex endocrine abnormalities or in settings where very low levels of testosterone are expected. For routine testing in adult patients, order "Testosterone" (test code TTES).

Testing may be helpful in assessing testicular function in males and managing hirsutism, virilization in females. Measurement of testosterone by LC/MS/MS overcomes interferences and the known limitations of direct immunoassays in measurement of testosterone values in the lower range. These advantages are particularly relevant for assessment of testosterone in women, children/infants, and men on testosterone reduction therapy for prostate cancer.

Reference ranges adapted from ARUP Laboratories (Clin Chem 2010; 56(7):1138-1147) based on patient correlation studies comparing this LC/MSMS method with the ARUP method and by in-house testing of 20 normal male and 20 normal female volunteers in the UCSF Chemistry laboratory at China Basin.

ADMINISTRATIVE

CPT Codes: 84403
LDT or Modified FDA: Yes
LOINC Codes:
Available Stat: No
Test Code: PTES
Test Group: Testosterone
Performing Lab: China Basin Chemistry
Performed: Set up Wednesday, reports next day
Methodology: LC/MS/MS
Collect: Red top
Amount to Collect: 2 mL blood
Sample Type: Serum
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Specimen Preparation: Centrifuge samples aliquot serum and refrigerate
Units: ng/dL
Reference Interval:

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<th>Females</th>
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</thead>
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<tr>
<td>Tanner Stage II</td>
<td>3-303 ng/dL</td>
<td>5-40 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage III</td>
<td>10-851 ng/dL</td>
<td>10-63 ng/dL</td>
</tr>
<tr>
<td>Tanner Stage IV-V</td>
<td>162-847 ng/dL</td>
<td>11-62 ng/dL</td>
</tr>
</tbody>
</table>

Synonyms: Testosterone ultrasensitive
Stability (from collection to initiation):
Refrigerated serum on cells: 3 days
Refrigerated serum: 2 weeks
Frozen serum: 3 years

**Reported:**
Test run once per week. Turnaround time 2-8 days

**Additional Information:**
This assay is primarily intended for testing in pediatric patients with suspected or complex endocrine abnormalities or in settings where very low levels of testosterone are expected. For routine testing in adult patients, order "Testosterone" (test code TTES).

Testing may be helpful in assessing testicular function in males and managing hirsutism, virilization in females. Measurement of testosterone by LC/MS/MS overcomes interferences and the known limitations of direct immunoassays in measurement of testosterone values in the lower range. These advantages are particularly relevant for assessment of testosterone in women, children/infants, and men on testosterone reduction therapy for prostate cancer.

Reference ranges adapted from ARUP Laboratories (Clin Chem 2010; 56(7):1138-1147) based on patient correlation studies comparing this LC/MSMS method with the ARUP method and by in-house testing of 20 normal male and 20 normal female volunteers in the UCSF Chemistry laboratory at China Basin.

**CPT Codes:**
84403

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
51005-7
Testosterone, Total
TTES

**ORDERING**

Available Stat:
- No

Performing Lab:
- China Basin Chemistry

Performed:
- Sunday and Wednesday (day shift)

Methodology:
- Two Step Chemiluminescent Microparticle Immunoassay on Abbott Architect i2000

Reported:
- 1-4 days

Additional Information:
- This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.
- To convert ng/dL to nmol/L (SI units) multiply by 0.0347.
- For pediatric patients, see entry for Testosterone, Ultrasensitive.

**COLLECTION**

Sample Type:
- Serum

Collect:
- Red top

Amount to Collect:
- 2 mL blood

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Stability (from collection to initiation):
- Room Temp: 8 hours
- Refrigerated (2-8°C): 3 days
- Frozen (-20°C): 7 days

**PROCESSING**

Test Code:
- TTES

Test Group:
- Testosterone

Performing Lab:
- China Basin Chemistry

Specimen Preparation:
- Refrigerate

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Stability (from collection to initiation):
- Room Temp: 8 hours
Refrigerated (2-8°C): 3 days
Frozen (-20°C): 7 days

RESULT INTERPRETATION

Units:
ng/dL

Reference Interval:
Males >= 18 years: 240-871 ng/dL
Females >= 18 years: 9-55 ng/dL

Reference ranges for females adapted from ARUP Laboratories & vendor performed studies and verified by in-house testing of 20 normal female volunteers in the UCSF laboratory.

Reference ranges for males adapted from vendor performed studies and verified by in-house testing of 22 normal male volunteers in the laboratory.

Additional Information:
This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

For pediatric patients, see entry for Testosterone, Ultrasensitive.

ADMINISTRATIVE

CPT Codes:
84403

LOINC Codes:
49041-7

COMPLETE VIEW

Available Stat:
No

Test Code:
TTES

Test Group:
Testosterone

Performing Lab:
China Basin Chemistry

Performed:
Sunday and Wednesday (day shift)

Methodology:
Two Step Chemiluminescent Microparticle Immunoassay on Abbott Architect i2000

Collect:
Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate
Units:
ng/dL

Reference Interval:
Males >= 18 years: 240-871 ng/dL
Females >= 18 years: 9-55 ng/dL

Reference ranges for females adapted from ARUP Laboratories & vendor performed studies and verified by in-house testing of 20 normal female volunteers in the UCSF laboratory.

Reference ranges for males adapted from vendor performed studies and verified by in-house testing of 22 normal male volunteers in the laboratory.

Stability (from collection to initiation):
Room Temp: 8 hours
Refrigerated (2-8°C): 3 days
Frozen (-20°C): 7 days

Reported:
1-4 days

Additional Information:
This assay is performed in-house and is suitable for use in adult patients to assess general endocrine function.

To convert ng/dL to nmol/L (SI units) multiply by 0.0347.

For pediatric patients, see entry for Testosterone, Ultrasensitive.

CPT Codes:
84403

LOINC Codes:
49041-7
## Tetanus Antitoxin
TETA

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- Enzyme Immunoassay

**Reported:**
- Test run Monday & Thursday. Turnaround time: 1-5 days.

**Additional Information:**
- Following immunization, levels usually increase approx. 4-fold.

**Synonyms:**
- Tetanus antitoxoid

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.3 mL serum

### PROCESSING

**Test Code:**
- TETA

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Freeze at -20°C. Order Quest # 50922P

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.3 mL serum

### RESULT INTERPRETATION

**Units:**
- IU/mL

**Reference Interval:**
- Detectable: > 0.1 IU/mL
- Protective: > 0.15 IU/mL
Additional Information:
Following immunization, levels usually increase approx. 4-fold.

Administrative

CPT Codes:
- 86774-90

LOINC Codes:
- 41483-9

Complete View

Available Stat:
- No

Test Code:
- TETA

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Enzyme Immunoassay

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.3 mL serum

Specimen Preparation:
- Freeze at -20C. Order Quest # 50922P

Units:
- IU/mL

Reference Interval:
- Detectable: > 0.1 IU/mL
- Protective: > 0.15 IU/mL

Synonyms:
- Tetanus antitoxoid

Reported:
- Test run Monday & Thursday. Turnaround time: 1-5 days.

Additional Information:
Following immunization, levels usually increase approx. 4-fold.

CPT Codes:
- 86774-90

LOINC Codes:
- 41483-9
Tetrahydrocannabinol Screen, Urine
THC

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Competitive enzyme immunoassay method (Beckman UniCel DxC800 analyzer) using G6PDH labeling
Reported:
Stat 2 hours, Routine 4 hours
Additional Information:
This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.
A concentration of < 50 µg/L is considered negative by this test. A positive result is >= 50 µg/L and indicates the presence of this class of drugs.
Cannabis metabolites can be detected in urine up to 95 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)
False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. False negative results are also possible, for example, with use of newer JWH compounds and other synthetic cannabinoids.

Click here for List of Cross Reactive Substances

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code THCQNT.

Synonyms:
- THC
- marijuana
- Tetrahydrocannabinol
- cannabis
- pot
- Cannabinoids

COLLECTION

Sample Type:
Random Urine
Collect:
Urine cup
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL urine
Minimum Volume:
0.5 mL urine
Stability (from collection to initiation):
Refrigerated 7 days, frozen at -20C 2. weeks
PROCESSING

Test Code: THC
Test Group: Cannabinoid
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume: 0.5 mL urine
Stability (from collection to initiation):
  Refrigerated 7 days, frozen at -20C 2. weeks

RESULT INTERPRETATION

Reference Interval:
  Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 50 µg/L

Additional Information:
  This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.
  A concentration of < 50 µg/L is considered negative by this test. A positive result is >= 50 µg/L and indicates the presence of this class of drugs.
  Cannabis metabolites can be detected in urine up to 95 days after use.( From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)
  False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. False negative results are also possible, for example, with use of newer JWH compounds and other synthetic cannabinoids.

Click here for List of Cross Reactive Substances

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code THCONT.

ADMINISTRATIVE

CPT Codes:
  80301
LOINC Codes:
  18282-4

COMPLETE VIEW

Available Stat:
  Yes
Test Code:
  THC
Test Group:
  Cannabinoid
Performing Lab:
  Parnassus & Mission Bay Chemistry
**Performed:**
Test available 24 hours per day 7 days per week

**Methodology:**
Competitive enzyme immunoassay method (Beckman UniCel DxC800 analyzer) using G6PDH labeling

**Collect:**
Urine cup

**Amount to Collect:**
See preferred volume

**Sample Type:**
Random Urine

**Preferred Volume:**
1 mL urine

**Minimum Volume:**
0.5 mL urine

**Reference Interval:**
Negative

Note: a negative result indicates that this class of drugs is not present, or they are present at a concentration below the cut-off concentration of 50 µg/L

**Synonyms:**
- THC
- marijuana
- Tetrahydrocannabinol
- cannabis
- pot
- Cannabinoids

**Stability (from collection to initiation):**
Refrigerated 7 days, frozen at -20°C 2. weeks

**Reported:**
Stat 2 hours, Routine 4 hours

**Additional Information:**
This immunoassay is only a screening test and is not definitive. Results cannot be used for medico-legal purposes.

A concentration of < 50 µg/L is considered negative by this test. A positive result is >= 50 µg/L and indicates the presence of this class of drugs.

Cannabis metabolites can be detected in urine up to 95 days after use. (From: Verstraete AG. Detection Times of Drugs of Abuse in Blood, Urine and Oral Fluid. Ther Drug Monit, 26(2) April 2004, 200-205)

False positive results may occur due to other cross reacting substances, however, positive results are NOT routinely confirmed by a second method. If confirmation of the test result is required, it is the responsibility of the physician to separately order a specific confirmatory test for the drug identified. False negative results are also possible, for example, with use of newer JWH compounds and other synthetic cannabinoids.

[Click here for List of Cross Reactive Substances](#)

Samples are held for 7 days. Contact laboratory at x 31667 to request confirmatory testing. Confirmation test code THCQNT.

**CPT Codes:**
80301

**LOINC Codes:**
18282-4
TH/TO Autoantibodies
THTO

ORDERING

Available Stat:
No
Performing Lab:
RDL Reference Lab
Methodology:
IPP
Reported:
10-14 days

COLLECTION

Sample Type:
Serum or Plasma
Collect:
Red top, Gold top or Lavender top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL Serum or Plasma
Minimum Volume:
1 mL Serum or Plasma

PROCESSING

Test Code:
THTO
Sendout:
Yes
Performing Lab:
RDL Reference Lab
Specimen Preparation:
Freeze serum/plasma aliquot
Preferred Volume:
1 mL Serum or Plasma
Minimum Volume:
1 mL Serum or Plasma

RESULT INTERPRETATION

Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
83516-90

COMPLETE VIEW
Available Stat:
   No
Test Code:
   THTO
Performing Lab:
   RDL Reference Lab
Sendout:
   Yes
Methodology:
   IPP
Collect:
   Red top, Gold top or Lavender top
Amount to Collect:
   2 mL blood
Sample Type:
   Serum or Plasma
Preferred Volume:
   1 mL Serum or Plasma
Minimum Volume:
   1 mL Serum or Plasma
Specimen Preparation:
   Freeze serum/plasma aliquot
Reference Interval:
   Negative
Reported:
   10-14 days
CPT Codes:
   83516-90
Thallium, 24 hour urine
MOLT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
ICP/MS
Reported:
Test performed Tuesday-Saturday. Turnaround time: 3-6 days.
Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 4.89

COLLECTION

Sample Type:
24 hour urine collection
Collect:
24 hour urine collection container
Amount to Collect:
Entire 24 hour urine output
Preferred Volume:
7 mL urine
Minimum Volume:
3 mL urine

PROCESSING

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate 7 mL aliquot. For 24 hour urine order Quest # 84723N.
Preferred Volume:
7 mL urine
Minimum Volume:
3 mL urine

RESULT INTERPRETATION

Units:
µg/L (mcg/L)
Reference Interval:
Normal: < 2 µg/L
Toxic: > 200 µg/L
Critical Values:
Quest Priority-1: >= 200 µg/L
Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 4.89

ADMINISTRATIVE

CPT Codes:
83018-90

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
ICP/MS

Collect:
24 hour urine collection container

Amount to Collect:
Entire 24 hour urine output

Sample Type:
24 hour urine collection

Preferred Volume:
7 mL urine

Minimum Volume:
3 mL urine

Specimen Preparation:
Follow the detailed processing instructions for Trace Metal Analysis. Refrigerate 7 mL aliquot. For 24 hour urine order Quest # 84723N.

Units:
µg/L (mcg/L)

Reference Interval:
Normal: < 2 µg/L
Toxic: > 200 µg/L

Critical Values:
Quest Priority-1: >= 200 µg/L

Reported:
Test performed Tuesday-Saturday. Turnaround time: 3-6 days.

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 4.89

CPT Codes:
83018-90
Thallium, random urine

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Inductively-coupled Plasma Mass Spectroscopy
Reported: Performed 5x per week. Turnaround 4-7 days.

COLLECTION

Sample Type: Random urine (second AM void preferred)
Collect: Urine cup
Amount to Collect: 7 mL urine
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Stability (from collection to initiation): Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.

PROCESSING

Test Code: THALR
Test Group: Thallium
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot into an acid-washed container. Refrigerate urine at 4C. Order Quest test # 57455P
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Stability (from collection to initiation): Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.

RESULT INTERPRETATION

Units: µg/g creatinine
Reference Interval: Printed 06/07/19
Test information subject to change
Available Stat: No
Test Code: THALR
Test Group: Thallium
Performing Lab: Quest
Sendout: Yes
Methodology: Inductively-coupled Plasma Mass Spectroscopy
Collect: Urine cup
Amount to Collect: 7 mL urine
Sample Type: Random urine (second AM void preferred)
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Specimen Preparation: Aliquot into an acid-washed container. Refrigerate urine at 4C. Order Quest test # 57455P
Units: µg/g creatinine
Reference Interval: <= 0.4 µg/g creatinine
Stability (from collection to initiation): Room temperature 2 days, refrigerated 5 days, frozen at -20C 2 weeks.
Reported: Performed 5x per week. Turnaround 4-7 days.
CPT Codes: 82570-90, 83018-90
LOINC Codes: 13469-2
THC Metabolite, Urine, Quantitative
THCQNT

ORDERING

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, THC (Cannabinoids), Urine Screen with Reflex to Quantitation (2012270) is preferred.

Performing Lab:
ARUP

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry

Reported:
1-4 days

Synonyms:
- 9-Carboxy-THC
- Cannabinoids
- Cannabis
- Dronabinol
- Marijuana
- Marinol
- Pain Management
- Pain Management, Marijuana Metabolite, Quantitative, with medMATCH, Urine
- Pain Management, Marijuana Metabolite, with Confirmation with medMATCH, Urine
- THC

COLLECTION

Collect:
Random urine.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

PROCESSING

Test Code:
THCQNT

Test Group:
Cannabinoid

ARUP Test Code:
0090369

Sendout:
Yes

Performing Lab:
ARUP
Specimen Preparation:
Transfer 1 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Storage/Transport Temperature:
Room temperature.

RESULT INTERPRETATION

Reference Interval:
Effective August 17, 2015

<table>
<thead>
<tr>
<th>Drugs Covered</th>
<th>Cutoff Concentrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-Nor-9-carboxy-THC</td>
<td>5 ng/mL</td>
</tr>
</tbody>
</table>

Interpretive Data:
Methodology: Liquid Chromatography-Tandem Mass Spectrometry
Positive cutoff: 5 ng/mL
For medical purposes only; not valid for forensic use.

The drug analyte detected in this assay, 9-carboxy THC, is a metabolite of delta-9-tetrahydrocannabinol (THC). Detection of 9-carboxy THC suggests use of, or exposure to, a product containing THC. This test cannot distinguish between prescribed or non-prescribed forms of THC, nor can it distinguish between active or passive use. The 9-carboxy THC metabolite can be detected in urine for several weeks. Normalization of results to creatinine concentration can help document elimination or suggest recent use, when specimens are collected at least one week apart.

ADMINISTRATIVE

CPT Codes:
80349 (Alt code: G0480)

LOINC:
- 3436-3

COMPLETE VIEW

Ordering Recommendations:
Preferred test to follow-up presumptive results. For general screening, THC (Cannabinoids), Urine Screen with Reflex to Quantitation (2012270) is preferred.

Test Code:
THCQNT

Test Group:
Cannabinoid

ARUP Test Code:
0090369

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Sun-Sat

Methodology:
Quantitative Liquid Chromatography-Tandem Mass Spectrometry
Collect:
Random urine.

Unacceptable Conditions:
Specimens exposed to repeated freeze/thaw cycles.

Specimen Preparation:
Transfer 1 mL urine with no additives or preservatives to an ARUP Standard Transport Tube. (Min: 0.5 mL)

Reference Interval:
Effective August 17, 2015

<table>
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Interpretive Data:
Methodology: Liquid Chromatography-Tandem Mass Spectrometry
Positive cutoff: 5 ng/mL
For medical purposes only; not valid for forensic use.

The drug analyte detected in this assay, 9-carboxy THC, is a metabolite of delta-9-tetrahydrocannabinol (THC). Detection of 9-carboxy THC suggests use of, or exposure to, a product containing THC. This test cannot distinguish between prescribed or non-prescribed forms of THC, nor can it distinguish between active or passive use. The 9-carboxy THC metabolite can be detected in urine for several weeks. Normalization of results to creatinine concentration can help document elimination or suggest recent use, when specimens are collected at least one week apart.

Synonyms:
- 9-Carboxy-THC
- Cannabinoids
- Cannabis
- Dronabinol
- Marijuana
- Marinol
- Pain Management
- Pain Management, Marijuana Metabolite, Quantitative, with medMATCH, Urine
- Pain Management, Marijuana Metabolite, with Confirmation with medMATCH, Urine
- THC

Storage/Transport Temperature:
Room temperature.

Stability (from collection to initiation):
Ambient: 1 week; Refrigerated: 1 month; Frozen: 3 years

Reported:
1-4 days

CPT Codes:
80349 (Alt code: G0480)

LOINC:
- 3436-3
Theophylline
THEO

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Turbidimetric inhibition immunoassay (Beckman DxC800)
Reported: STAT 1 hour, Routine 4 hours

Additional Information:
According to the UpToDate guidelines (accessed May 21, 2012) on “Theophylline use in asthma” by Hendeles and Weinberger, MD, “The efficacy and toxicity of theophylline are closely related to the PEAK serum concentration. In patients receiving theophylline monotherapy, doses providing a PEAK serum concentration of 10 to 20 mg/L (mcg/mL) are best documented to improve symptoms and reduce the need for rescue therapy. However, bronchodilatory, antiinflammatory, and immunomodulatory effects of this drug are detectable at levels as low as 5 mg/L; in addition, serum concentrations of 5 to 10 mg/L may be adequate for some patients, particularly if they are also receiving inhaled glucocorticoids.” These authors also state that they “recommend titrating dosage to a PEAK concentration of 10 to 15 mg/L with a theophylline formulation and dosing interval that will not result in large fluctuations between the peak and trough levels. A widely quoted guideline recommends a target serum concentration of 5 to 15 mg/L, but does not specify whether this should be a peak or trough level. Such a distinction is important because fluctuations in serum concentration can be sufficient for a trough concentration in the 5 to 15 mg/L range to result in a peak above 20 mg/L and consequent toxicity.”

Note: The presence of human anti-mouse antibodies or heterophile antibodies may interfere with the theophylline assay in some cases. Testing for theophylline levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's “A Guide on Drug Level Monitoring” (in the Chemistry Guide) for additional information.

Synonyms:
- Theodur

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Remarks: Time to steady state: highly variable 3-4 days (adults) or 3 doses
Indicate date and time of draw on requisition.
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen 1 week

PROCESSING

Test Code:
THEO
Performing Lab:
   Parnassus & Mission Bay Chemistry
Preferred Volume:
   0.5 mL serum or plasma
Minimum Volume:
   0.2 mL serum or plasma
Stability (from collection to initiation):
   Room temperature 8 hours, refrigerated 2 days, frozen 1 week

RESULT INTERPRETATION

Units:
   mg/L
Reference Interval:
   Therapeutic peak: 5-20 mg/L
Critical Values:
   >30 mg/L
Additional Information:
   According to the UpToDate guidelines (accessed May 21, 2012) on "Theophylline use in asthma" by Hendeles and Weinberger, MD, "The efficacy and toxicity of theophylline are closely related to the PEAK serum concentration. In patients receiving theophylline monotherapy, doses providing a PEAK serum concentration of 10 to 20 mg/L (mcg/mL) are best documented to improve symptoms and reduce the need for rescue therapy. However, bronchodilatory, antiinflammatory, and immunomodulatory effects of this drug are detectable at levels as low as 5 mg/L; in addition, serum concentrations of 5 to 10 mg/L may be adequate for some patients, particularly if they are also receiving inhaled glucocorticoids." These authors also state that they "recommend titrating dosage to a PEAK concentration of 10 to 15 mg/L with a theophylline formulation and dosing interval that will not result in large fluctuations between the peak and trough levels. A widely quoted guideline recommends a target serum concentration of 5 to 15 mg/L, but does not specify whether this should be a peak or trough level. Such a distinction is important because fluctuations in serum concentration can be sufficient for a trough concentration in the 5 to 15 mg/L range to result in a peak above 20 mg/L and consequent toxicity."

   Note: The presence of human anti-mouse antibodies or heterophile antibodies may interfere with the theophylline assay in some cases. Testing for theophylline levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
   80198
LOINC Codes:
   4049-3

COMPLETE VIEW

Available Stat:
   Yes
Test Code:
   THEO
Performing Lab:
   Parnassus & Mission Bay Chemistry
Performed:
   Test available 24 hours per day 7 days per week
Methodology:
   Turbidimetric inhibition immunoassay (Beckman DxC800)
Remarks:
   Time to steady state: highly variable 3-4 days (adults) or 3 doses
Indicate date and time of draw on requisition.

Collect:
- Gold top or Light Green top

Amount to Collect:
- 1 mL blood

Sample Type:
- Serum or plasma

Preferred Volume:
- 0.5 mL serum or plasma

Minimum Volume:
- 0.2 mL serum or plasma

Units:
- mg/L

Reference Interval:
- Therapeutic peak: 5-20 mg/L

Critical Values:
- >30 mg/L

Synonyms:
- Theodur

Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days, frozen 1 week

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:

According to the UpToDate guidelines (accessed May 21, 2012) on "Theophylline use in asthma" by Hendeles and Weinberger, MD, "The efficacy and toxicity of theophylline are closely related to the PEAK serum concentration. In patients receiving theophylline monotherapy, doses providing a PEAK serum concentration of 10 to 20 mg/L (mcg/mL) are best documented to improve symptoms and reduce the need for rescue therapy. However, bronchodilatory, anti-inflammatory, and immunomodulatory effects of this drug are detectable at levels as low as 5 mg/L; in addition, serum concentrations of 5 to 10 mg/L may be adequate for some patients, particularly if they are also receiving inhaled glucocorticoids." These authors also state that they "recommend titrating dosage to a PEAK concentration of 10 to 15 mg/L with a theophylline formulation and dosing interval that will not result in large fluctuations between the peak and trough levels. A widely quoted guideline recommends a target serum concentration of 5 to 15 mg/L, but does not specify whether this should be a peak or trough level. Such a distinction is important because fluctuations in serum concentration can be sufficient for a trough concentration in the 5 to 15 mg/L range to result in a peak above 20 mg/L and consequent toxicity."

Note: The presence of human anti-mouse antibodies or heterophile antibodies may interfere with the theophylline assay in some cases. Testing for theophylline levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:
- 80198

LOINC Codes:
- 4049-3
Thermal Amplitude Test
MOLT

ORDERING

Approval Required:
Yes; Approval from the Clinical Hematology Consult Service is required before order is placed.

Performing Lab:
American Red Cross (ARC) Immunohematology Reference Lab (Pomona, CA)

Performed:
Test set up Monday-Friday

Reported:
4-7 days

Additional Information:
The thermal amplitude test is performed to determine the reactivity of a cold autoantibody at varying temperatures. Cold autoantibodies that are reactive at temperatures equal to or greater than 30° C have the potential to be clinically significant. Cold antibodies that are reactive at < 30° C are not clinically significant.

COLLECTION

Sample Type:
Serum and EDTA anti-coagulated whole blood

Collect:
2 red and 2 lavender tops

Amount to Collect:
Red top: 2 x 6 mL
Lavender (EDTA) top: 2 x 7 mL

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.

Storage/Transport Temperature:
Tubes need to be transported at ROOM TEMP.

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
American Red Cross (ARC) Immunohematology Reference Lab (Pomona, CA)

Specimen Preparation:
Send samples to blood bank to be shipped at ROOM TEMP to ARC Reference Lab. Do not separate plasma or serum.

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

Storage/Transport Temperature:
Tubes need to be transported at ROOM TEMP.

RESULT INTERPRETATION

Reference Interval:
Titer <= 64 at 4°C and 21°C; No agglutination at 30°C and 37°C phases of testing
Additional Information:

The thermal amplitude test is performed to determine the reactivity of a cold autoantibody at varying temperatures. Cold autoantibodies that are reactive at temperatures equal to or greater than 30° C have the potential to be clinically significant. Cold antibodies that are reactive at < 30° C are not clinically significant.

COMPLETE VIEW

Approval Required:
Yes; Approval from the Clinical Hematology Consult Service is required before order is placed.

Test Code:
MOLT

Performing Lab:
American Red Cross (ARC) Immunohematology Reference Lab (Pomona, CA)

Sendout:
Yes

Performed:
Test set up Monday-Friday

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample, or phlebotomist ID.

Collect:
2 red and 2 lavender tops

Amount to Collect:
Red top: 2 x 6 mL
Lavender (EDTA) top: 2 x 7 mL

Sample Type:
Serum and EDTA anti-coagulated whole blood

Unacceptable Conditions:
Mislabeled or unlabeled sample, phlebotomist ID or name not documented on label.

Specimen Preparation:
Send samples to blood bank to be shipped at ROOM TEMP to ARC Reference Lab. Do not separate plasma or serum.

Reference Interval:
Titer <= 64 at 4°C and 21°C; No agglutination at 30°C and 37°C phases of testing

Storage/Transport Temperature:
Tubes need to be transported at ROOM TEMP.

Reported:
4-7 days

Additional Information:
The thermal amplitude test is performed to determine the reactivity of a cold autoantibody at varying temperatures. Cold autoantibodies that are reactive at temperatures equal to or greater than 30° C have the potential to be clinically significant. Cold antibodies that are reactive at < 30° C are not clinically significant.
Thiocyanate
SCN

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Colorimetric
Reported: Test run Monday-Friday. Turnaround time: 1-4 days.
Additional Information: To convert mg/dL to µmol/L (SI units) multiply by 172.

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top NOT acceptable)
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL serum
Minimum Volume: 1 mL serum
Unacceptable Conditions: Collected in Gold top

PROCESSING

Test Code: SCN
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Separate serum immediately and freeze in a plastic transport vial at -20C. Order Quest # 879X
Preferred Volume: 2 mL serum
Minimum Volume: 1 mL serum
Unacceptable Conditions: Collected in Gold top

RESULT INTERPRETATION

Units: mg/dL
Reference Interval:
Non-smokers <0.4 mg/dL
Smokers <2.0 mg/dL
Nitroprusside infusion <2.9 mg/dL
Toxic >10 mg/dL

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 172.

ADMINISTRATIVE

CPT Codes:
- 84430-90

LOINC Codes:
- 3002-3

COMPLETE VIEW

Available Stat:
No

Test Code:
SCN

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Colorimetric

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
1 mL serum

Unacceptable Conditions:
Collected in Gold top

Specimen Preparation:
Separate serum immediately and freeze in a plastic transport vial at -20°C. Order Quest # 879X

Units:
mg/dL

Reference Interval:
- Non-smokers <0.4 mg/dL
- Smokers <2.0 mg/dL
- Nitroprusside infusion <2.9 mg/dL
- Toxic >10 mg/dL

Reported:
Test run Monday-Friday. Turnaround time: 1-4 days.

Additional Information:
To convert mg/dL to µmol/L (SI units) multiply by 172.

CPT Codes:
- 84430-90

LOINC Codes:
- 3002-3
Thiopental
MOLT

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: GC
Reported: Test performed daily. Turnaround time: 1-3 days
Additional Information: Includes testing for metabolite Pentobarbital.

Because of readier availability of the assay for pentobarbital, and because release of thiopental from fat depots after the patient has been on continuous IV therapy cannot be controlled, pentobarbital is preferred for sustaining barbiturate coma (thiopental is partially metabolized to pentobarbital). In a patient receiving only thiopental therapy, a pentobarbital level which exceeds 2.0 mg/L indicates hepatic toxicity. If both pentobarbital and thiopental are being administered normal ranges for each apply

Synonyms:
• Pentothal

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Wrap the tube in aluminum foil to protect it from light.

PROCESSING

Test Code: MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Refrigerate serum in a dark pour-off vial. Order Quest # 94403
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum

RESULT INTERPRETATION
Units:
mg/L

Reference Interval:
- Sedative: 1-5 mg/L
- Toxic: > 10 mg/L
- Anoxic Rx: 20-60 mg/L

Additional Information:
Includes testing for metabolite Pentobarbital.

Because of readier availability of the assay for pentobarbital, and because release of thiopental from fat depots after the patient has been on continuous iv therapy cannot be controlled, pentobarbital is preferred for sustaining barbiturate coma (thiopental is partially metabolized to pentobarbital). In a patient receiving only thiopental therapy, a pentobarbital level which exceeds 2.0 mg/L indicates hepatic toxicity. If both pentobarbital and thiopental are being administered normal ranges for each apply.

CPT Codes:
- 82205-90 x2

COMPLETE VIEW

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
Quest

Sendout:
Yes

Methodology:
GC

Remarks:
Wrap the tube in aluminum foil to protect it from light.

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Specimen Preparation:
Refrigerate serum in a dark pour-off vial. Order Quest # 94403

Units:
mg/L

Reference Interval:
- Sedative: 1-5 mg/L
- Toxic: > 10 mg/L
- Anoxic Rx: 20-60 mg/L

Synonyms:
- Pentothal

Reported:
Test performed daily. Turnaround time: 1-3 days
Additional Information:

Includes testing for metabolite Pentobarbital.

Because of readier availability of the assay for pentobarbital, and because release of thiopental from fat depots after the patient has been on continuous iv therapy cannot be controlled, pentobarbital is preferred for sustaining barbiturate coma (thiopental is partially metabolized to pentobarbital). In a patient receiving only thiopental therapy, a pentobarbital level which exceeds 2.0 mg/L indicates hepatic toxicity. If both pentobarbital and thiopental are being administered normal ranges for each apply.

CPT Codes:

82205-90 x2
Thiopurine Metabolites
THM

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LC/MS/MS
Synonyms:
- 6-Thioguanine
- 6-TG
- 6-MMP

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top (6 mL size)
Amount to Collect:
5 mL
Preferred Volume:
5 mL blood
Minimum Volume:
2.5 mL blood
Remarks:
Collect as a trough specimen 1 hour prior to next dose
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days. Frozen samples are unacceptable.
Unacceptable Conditions:
Hemolyzed or clotted samples.
Rejection Criteria:
Frozen, hemolyzed or clotted samples.

PROCESSING

Test Code:
THM
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate sample, DO NOT aliquot. or freeze Transport to China Basin refrigerated. Quest order code is #91745
Preferred Volume:
5 mL blood
Minimum Volume:
2.5 mL blood
Unacceptable Conditions:
Hemolyzed or clotted samples.
Rejection Criteria:
- Frozen, hemolyzed or clotted samples.

Stability (from collection to initiation):
- Room temperature 2 days, refrigerated 5 days. Frozen samples are unacceptable.

**ADMINISTRATIVE**

CPT Codes:
- 83789-90

LOINC Codes:
- 32660-3, 32654-6

**COMPLETE VIEW**

Available Stat:
- No

Test Code:
- THM

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- LC/MS/MS

Remarks:
- Collect as a trough specimen 1 hour prior to next dose

Collect:
- Lavender top (6 mL size)

Amount to Collect:
- 5 mL

Sample Type:
- EDTA whole blood

Preferred Volume:
- 5 mL blood

Minimum Volume:
- 2.5 mL blood

Rejection Criteria:
- Frozen, hemolyzed or clotted samples.

Unacceptable Conditions:
- Hemolyzed or clotted samples.

Specimen Preparation:
- Refrigerate sample, DO NOT aliquot or freeze. Transport to China Basin refrigerated. Quest order code is #91745

Synonyms:
- 6-Thioguanine
- 6-TG
- 6-MMP

Stability (from collection to initiation):
- Room temperature 2 days, refrigerated 5 days. Frozen samples are unacceptable.

CPT Codes:
- 83789-90

LOINC Codes:
- 32660-3, 32654-6
Thiopurine methyl transferase Genotyping
TPMTGN

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
PCR, Single nucleotide primer extension reaction
Reported:
Set up 2x per week. Turnaround 5-7 days
Synonyms:
- TPMT
- myelotoxicity

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL
Preferred Volume:
5 mL
Minimum Volume:
3 mL
Stability (from collection to initiation):
Room temperature 8 days, refrigerated 8 days

PROCESSING

Test Code:
TPMTGN
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Ship whole blood at room temperature to China basin for sendout to Quest. Order Quest test # 37742Z. DO NOT freeze sample.
Preferred Volume:
5 mL
Minimum Volume:
3 mL
Stability (from collection to initiation):
Room temperature 8 days, refrigerated 8 days

ADMINISTRATIVE

CPT Codes:
83890-90, 83900-90, 83912-90, 83892-90 x2, 83896-90 x4
Available Stat:  No
Test Code:  TPMTGN
Performing Lab:  Quest
Sendout:  Yes
Methodology:  PCR, Single nucleotide primer extension reaction
Collect:  Lavender top (6 mL size preferred)
Amount to Collect:  6 mL
Sample Type:  EDTA whole blood
Preferred Volume:  5 mL
Minimum Volume:  3 mL
Specimen Preparation:  Ship whole blood at room temperature to China basin for sendout to Quest. Order Quest test # 37742Z. DO NOT freeze sample.
Synonyms:  
  • TPMT
  • myelotoxicity
Stability (from collection to initiation):  Room temperature 8 days, refrigerated 8 days
Reported:  Set up 2x per week. Turnaround 5-7 days
CPT Codes:  83890-90, 83900-90, 83912-90, 83892-90 x2, 83896-90 x4

Test information subject to change
Thiopurine Methyltransferase Activity
TPMTA

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS/MS
Additional Information:
Testing is used to prevent hepatotoxicity from thiopurine therapy. This test can identify individuals at increased risk of hepatotoxicity from thiopurine dose escalation.

Patients with a TMPT activity of 4-12 nmol 6-MMP/hr/mL RBC (heterozygote/low metabolizer) are at increased risk and may require a lower dose of thiopurine drug.

Synonyms:
● TMPT enzyme

COLLECTION

Sample Type: EDTA whole blood
Collect:
Lavender top x2
Amount to Collect:
8 ml blood
Preferred Volume:
8 mL blood (4 mL in EACH tube)
Minimum Volume:
4 mL blood (2 mL in EACH tube)
Remarks:
NOTE: Two (2) separate lavender top tubes are required for testing. Preferred to have 4 mL in each tube. Minimum sample volume would be 2 mL in each tube.

Stability (from collection to initiation):
Room temperature 2 days, refrigerated 6 days.

Unacceptable Conditions:
Clotted or hemolyzed samples.

Rejection Criteria:
Frozen samples. Clotted or hemolyzed samples

PROCESSING

Test Code:
TPMTA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate samples (Do NOT freeze) and ship refrigerated to China Basin. Quest test order code is #18831
Preferred Volume:
8 mL blood (4 mL in EACH tube)
**Minimum Volume:**
4 mL blood (2 mL in EACH tube)

**Unacceptable Conditions:**
Clotted or hemolyzed samples.

**Rejection Criteria:**
Frozen samples. Clotted or hemolyzed samples

**Stability (from collection to initiation):**
Room temperature 2 days, refrigerated 6 days.

---

**RESULT INTERPRETATION**

**Units:**
6 -MMP/hr/mL RBC

**Additional Information:**
Testing is used to prevent hepatotoxicity from thiopurine therapy. This test can identify individuals at increased risk of hepatotoxicity from thiopurine dose escalation.

Patients with a TMPT activity of 4-12 nmol 6-MMP/hr/mL RBC (heterozygote/low metabolizer) are at increased risk and may require a lower dose of thiopurine drug.

---

**ADMINISTRATIVE**

**CPT Codes:**
83789-90

**LOINC Codes:**
21563-2

---

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
TPMTA

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
LC/MS/MS

**Remarks:**

**NOTE:** Two (2) separate lavender top tubes are required for testing. Preferred to have 4 mL in each tube. Minimum sample volume would be 2 mL in each tube.

**Collect:**
Lavender top x2

**Amount to Collect:**
8 ml blood

**Sample Type:**
EDTA whole blood

**Preferred Volume:**
8 mL blood (4 mL in EACH tube)

**Minimum Volume:**
4 mL blood (2 mL in EACH tube)

**Rejection Criteria:**
Frozen samples. Clotted or hemolyzed samples

**Unacceptable Conditions:**
Clotted or hemolyzed samples.

**Specimen Preparation:**
Refrigerate samples (Do NOT freeze) and ship refrigerated to China Basin. Quest test order code is #18831

**Units:**
6 -MMP/hr/mL RBC

**Synonyms:**
- TMPT enzyme

**Stability (from collection to initiation):**
Room temperature 2 days, refrigerated 6 days.

**Additional Information:**
Testing is used to prevent hepatotoxicity from thiopurine therapy. This test can identify individuals at increased risk of hepatotoxicity from thiopurine dose escalation.

Patients with a TMPT activity of 4-12 nmol 6-MMP/hr/mL RBC (heterozygote/low metabolizer) are at increased risk and may require a lower dose of thiopurine drug.

**CPT Codes:**
83789-90

**LOINC Codes:**
21563-2
Thrombin Time

ORDERING

Available Stat: Yes
Performing Lab: Parnassus Hematology
Performed:
STAT: 24 hours, 7 days a week
Routine: Daily, day shift
Reported:
Routine: 24 hours
STAT: 1 hour
Additional Information:
A prolonged thrombin time can be due to inhibitors of thrombin (for example, unfractionated heparin, direct thrombin inhibitors including argatroban and lepirudin, or paraneoplastic-associated heparinoid) or fibrinogen abnormalities (afibrinogenemia, hypofibrinogenemia, dysfibrinogenemia, anti-fibrinogen antibodies, or high fibrin split products). Correlation with fibrinogen level and clinical setting is suggested. Laboratory medicine resident can be reached by contacting the hematology lab at 353-1747.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for.

Thrombin time is performed at Parnassus Hematology. Samples from Mission Bay or Mt. Zion that are ordered routine will be sent to Parnassus on a routine courier. Please contact Mission Bay or Mt. Zion Hematology lab if a STAT thrombin time is ordered so that a STAT courier can be requested for delivery to Parnassus.

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Remarks:
Do not draw from heparin-containing lines.
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code:
TT
Performing Lab:
Parnassus Hematology

Specimen Preparation:
Test specimens within four hours of collection or freeze plasma in a plastic tube at -20C.

Preferred Volume:
1 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Units:
seconds

Reference Interval:
21.6-30.1 sec

Additional Information:
A prolonged thrombin time can be due to inhibitors of thrombin (for example, unfractionated heparin, direct thrombin inhibitors including argatroban and lepirudin, or paraneoplastic-associated heparinoid) or fibrinogen abnormalities (afibrinogenemia, hypofibrinogenemia, dysfibrinogenemia, anti-fibrinogen antibodies, or high fibrin split products). Correlation with fibrinogen level and clinical setting is suggested. Laboratory medicine resident can be reached by contacting the hematology lab at 353-1747.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Thrombin time is performed at Parnassus Hematology. Samples from Mission Bay or Mt. Zion that are ordered routine will be sent to Parnassus on a routine courier. Please contact Mission Bay or Mt. Zion Hematology lab if a STAT thrombin time is ordered so that a STAT courier can be requested for delivery to Parnassus.

ADMINISTRATIVE

CPT Codes:
85670

LOINC Codes:
3243-3

COMPLETE VIEW

Available Stat:
Yes

Test Code:
TT

Performing Lab:
Parnassus Hematology

Performed:
STAT: 24 hours, 7 days a week
Routine: Daily, day shift

Remarks:
Do not draw from heparin-containing lines.

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled toabove the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (For Parnassus patients call 3-1747, for Mission Bay patients call 6-0194) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum
Amount to Collect: 2.7 mL blood
Sample Type: Citrated plasma
Preferred Volume: 1 mL plasma
Unacceptable Conditions: Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Specimen Preparation: Test specimens within four hours of collection or freeze plasma in a plastic tube at -20C.
Units: seconds
Reference Interval: 21.6-30.1 sec
Reported: Routine: 24 hours STAT: 1 hour
Additional Information: A prolonged thrombin time can be due to inhibitors of thrombin (for example, unfractionated heparin, direct thrombin inhibitors including argatroban and lepirudin, or paraneoplastic-associated heparinoid) or fibrinogen abnormalities (afibrinogenemia, hypofibrinogenemia, dysfibrinogenemia, anti-fibrinogen antibodies, or high fibrin split products). Correlation with fibrinogen level and clinical setting is suggested. Laboratory medicine resident can be reached by contacting the hematology lab at 353-1747.

If unusual findings are noted a pathologist review and interpretation may be performed and separately billed for

Thrombin time is performed at Parnassus Hematology. Samples from Mission Bay or Mt. Zion that are ordered routine will be sent to Parnassus on a routine courier. Please contact Mission Bay or Mt. Zion Hematology lab if a STAT thrombin time is ordered so that a STAT courier can be requested for delivery to Parnassus.

CPT Codes: 85670
LOINC Codes: 3243-3
Thyroglobulin Antibodies
TGAB

ORDERING

Available Stat:  
No
Performing Lab:  
China Basin Chemistry
Performed:  
Tuesday, Friday (day shift)
Methodology:  
Chemiluminescent Microparticle Immunoassay-Abbott Architect i2000
Reported:  
1-5 days
Additional Information:  
This assay is automatically performed and reported whenever a thyroglobulin test is ordered. The presence of anti-thyroglobulin antibodies can variably interfere in thyroglobulin immunoassays and tend to falsely lower thyroglobulin results.

Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.

The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer's reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately 20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV cutoff) are reported as <2.00.

Synonyms:
• anti-Tg antibodies
• anti-TGLB antibodies
• anti-Thyroglobulin antibodies

COLLECTION

Sample Type:  
Serum
Collect:  
Gold top
Amount to Collect:  
2 mL blood
Preferred Volume:  
1 mL serum
Minimum Volume:  
0.15 mL serum
Stability (from collection to initiation):  
Refrigerated 7 days, frozen 1 month.

PROCESSING

Test Code:  
TGAB
Test Group:  
Thyroid tests
Performing Lab:  
China Basin Chemistry
Specimen Preparation:
Freeze serum at -20C.

Preferred Volume:
1 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Refrigerated 7 days, frozen 1 month.

RESULT INTERPRETATION

Units:
IU/mL

Reference Interval:
<2.00 IU/mL

Reference range is based on the functional CV cutoff (20% CV cutoff) for the assay estimated by monitoring the CV in low end patient pools and samples tested over periods of 1 - 6 months. This functional CV cutoff is in accord with that reported by Pickett et al, Ann Clin Biochem, 49:463-467, 2012 for the Abbott Architect assay. Approximately 80% of healthy subjects with normal thyroid function tests and no thyroperoxidase antibodies will have an anti-TG antibody level < 2.00 IU/mL in this assay. The normal range cutoff has been set at the lower reporting limit of the assay (functional CV cutoff) in accordance with the view that any detectable level of anti-thyroglobulin antibody may be considered abnormal and might negatively interfere in the thyroglobulin assay.

Additional Information:
This assay is automatically performed and reported whenever a thyroglobulin test is ordered. The presence of anti-thyroglobulin antibodies can variably interfere in thyroglobulin immunoassays and tend to falsely lower thyroglobulin results.

Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.

The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer's reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately 20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV cutoff) are reported as <2.00.

ADMINISTRATIVE

CPT Codes:
86800

LOINC Codes:
8098-6

COMPLETE VIEW

Available Stat:
No

Test Code:
TGAB

Test Group:
Thyroid tests

Performing Lab:
China Basin Chemistry

Performed:
Tuesday, Friday (day shift)

Methodology:
Chemiluminescent Microparticle Immunoassay-Abbott Architect i2000

Collect:
Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.15 mL serum

**Specimen Preparation:**
Freeze serum at -20°C.

**Units:**
IU/mL

**Reference Interval:**
<2.00 IU/mL

Reference range is based on the functional CV cutoff (20% CV cutoff) for the assay estimated by monitoring the CV in low end patient pools and samples tested over periods of 1 - 6 months. This functional CV cutoff is in accord with that reported by Pickett et al, Ann Clin Biochem, 49:463-467, 2012 for the Abbott Architect assay. Approximately 80% of healthy subjects with normal thyroid function tests and no thyroperoxidase antibodies will have an anti-TG antibody level < 2.00 IU/mL in this assay. The normal range cutoff has been set at the lower reporting limit of the assay (functional CV cutoff) in accordance with the view that any detectable level of anti-thyroglobulin antibody may be considered abnormal and might negatively interfere in the thyroglobulin assay.

**Synonyms:**
- anti-Tg antibodies
- anti-TGLB antibodies
- abnTI-Thyroglobulin antibodies

**Stability (from collection to initiation):**
Refrigerated 7 days, frozen 1 month.

**Reported:**
1-5 days

**Additional Information:**
This assay is automatically performed and reported whenever a thyroglobulin test is ordered. The presence of anti-thyroglobulin antibodies can variably interfere in thyroglobulin immunoassays and tend to falsely lower thyroglobulin results.

Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.

The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer’s reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately 20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV cutoff) are reported as <2.00.

**CPT Codes:**
86800

**LOINC Codes:**
8098-6
Thyroglobulin, Body Fluid (FNA)
TGLBF

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
Parnassus Chemistry

Performed:
Tuesday, Friday (day shift)

Methodology:
Immunoenzymatic assay (Beckman Access assay on UnicelDxI 600)

Reported:
1-5 days

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."

Measurement of thyroglobulin in lymph node aspirates may be useful for diagnosis of metastatic differentiated thyroid cancer. In a study of 190 malignant lymph nodes, and 338 benign lymph nodes, the median FNA-Tg was 521.2 (3676.8) ng/mL in the malignant LNs, and 0.1 (0.2) ng/mL in the benign LNs. The optimal cutoff value of FNA-Tg in distinguishing malignant LNs from benign LNs was 1.0 ng/mL (sensitivity, 93.2%; specificity, 95.9%). Moon et al, J Clin Endo Metab, March 2013.

Note that the presence of anti-TG antibodies may tend to decrease results of TG measurements. The extent to which the presence of anti-TG antibodies interferes in the assessment of FNA-TG measurements is unclear. Some, but not all, investigators have suggested that FNA-TG results are still useful even in the presence of anti-TG antibodies. Cunha et al, European Journal of Endocrinology (2007) 157 101-107.

In this Beckman Access assay on the UnicelDxI platform, the functional sensitivity defined as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified in house and in other laboratories to be < 0.1 µg/L (Malandrino et al, J Clin Endocrinol Metab 2011). Results below 0.1 µg/L are reported as < 0.1 µg/L.

Synonyms:
- TGB
- TGLB
- Tg
- Thyroid cancer

COLLECTION

Sample Type:
Fine needle aspirate fluid or tissue aspirate

Collect:
Sterile tube (see collection instructions)

Amount to Collect:
1.0 mL (see collection instructions)

Preferred Volume:
1 mL fluid

Minimum Volume:
0.5 mL fluid
Remarks:
Submit fine needle aspiration (FNA) samples suspended in 1.0 mL (20 drops) of saline in a sterile tube. Each sample should be labeled with an identifier and the same information listed below to allow for proper identification of sample(s) on lab reports.

Deliver immediately to laboratory

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen 1 month

PROCESSING

Test Code:
TGLBF
Test Group:
Thyroid tests
Performing Lab:
Parnassus Chemistry
Specimen Preparation:
Centrifuge sample and refrigerate.
Preferred Volume:
1 mL fluid
Minimum Volume:
0.5 mL fluid
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 1 week, frozen 1 month

RESULT INTERPRETATION

Units:
µg/L
Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

Measurement of thyroglobulin in lymph node aspirates may be useful for diagnosis of metastatic differentiated thyroid cancer. In a study of 190 malignant lymph nodes, and 338 benign lymph nodes, the median FNA-Tg was 521.2 (3676.8) ng/mL in the malignant LNs, and 0.1 (0.2) ng/mL in the benign LNs. The optimal cutoff value of FNA-Tg in distinguishing malignant LNs from benign LNs was 1.0 ng/mL (sensitivity, 93.2%; specificity, 95.9%). Moon et al, J Clin Endo Metab, March 2013.

Note that the presence of anti-TG antibodies may tend to decrease results of TG measurements. The extent to which the presence of anti-TG antibodies interferes in the assessment of FNA-Tg measurements is unclear. Some, but not all, investigators have suggested that FNA-TG results are still useful even in the presence of anti-TG antibodies. Cunha et al, European Journal of Endocrinology (2007) 157 101-107.

In this Beckman Access assay on the UnicelDxi platform, the functional sensitivity defined as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified in house and in other laboratories to be < 0.1 µg/L (Malandrino et al, J ClinEndocrinolMetab 2011). Results below 0.1 µg/L are reported as < 0.1 µg/L.

ADMINISTRATIVE

CPT Codes:
84432
LDT or Modified FDA:
Yes
LOINC Codes:
Available Stat: No
Ordering Recommendations: Not a routinely available test. See 'Additional information'
Test Code: TGLBF
Test Group: Thyroid tests
Performing Lab: Parnassus Chemistry
Performed: Tuesday, Friday (day shift)
Methodology: Immunoenzymatic assay (Beckman Access assay on UnicelDxI 600)
Remarks: Submit fine needle aspiration (FNA) samples suspended in 1.0 mL (20 drops) of saline in a sterile tube. Each sample should be labeled with an identifier and the same information listed below to allow for proper identification of sample(s) on lab reports.
Deliver immediately to laboratory
Collect: Sterile tube (see collection instructions)
Amount to Collect: 1.0 mL (see collection instructions)
Sample Type: Fine needle aspirate fluid or tissue aspirate
Preferred Volume: 1 mL fluid
Minimum Volume: 0.5 mL fluid
Specimen Preparation: Centrifuge sample and refrigerate.
Units: µg/L
Synonyms: TGB, TGLB, Tg, Thyroid cancer
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 1 week, frozen 1 month
Reported: 1-5 days
Additional Information: As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.
All results will be appended with a disclaimer: "The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation."
Measurement of thyroglobulin in lymph node aspirates may be useful for diagnosis of metastatic differentiated thyroid cancer. In a study of 190 malignant lymph nodes, and 338 benign lymph nodes, the median FNA-Tg was 521.2 (3676.8) ng/mL in the malignant LNs, and
0.1 (0.2) ng/mL in the benign LNs. The optimal cutoff value of FNA-Tg in distinguishing malignant LNs from benign LNs was 1.0 ng/mL (sensitivity, 93.2%; specificity, 95.9%). Moon et al, J Clin Endo Metab, March 2013.

Note that the presence of anti-TG antibodies may tend to decrease results of TG measurements. The extent to which the presence of anti-TG antibodies interferes in the assessment of FNA-TG measurements is unclear. Some, but not all, investigators have suggested that FNA-TG results are still useful even in the presence of anti-TG antibodies. Cunha et al, European Journal of Endocrinology (2007) 157 101-107.

In this Beckman Access assay on the UnicelDxi platform, the functional sensitivity defined as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified in house and in other laboratories to be < 0.1 µg/L (Malandrino et al, J ClinEndocrinolMetab 2011). Results below 0.1 µg/L are reported as < 0.1 µg/L.

CPT Codes:
84432

LDT or Modified FDA:
Yes

LOINC Codes:
53922-1
Thyroglobulin, LC/MS-MS
MOLT

ORDERING

Ordering Recommendations:
This test is intended for patients with a known thyroglobulin or heterophile antibody that could interfere with our in-house ultrasensitive thyroglobulin immunoassays.

Note: Isolated LC/MS-MS testing is not listed in LabCorp's online test menu; this testing has been specifically arranged between LacCorp and UCSF.

Performing Lab:
LabCorp

Performed:
Varies

Methodology:
LC/MS-MS

Reported:
Varies

Additional Information:
The functional sensitivity of this assay is 0.2 ng/mL.

COLLECTION

Sample Type:
Serum

Collect:
Gold-top or red-top tube

Amount to Collect:
3 mL blood

Preferred Volume:
1.5 mL serum

Minimum Volume:
1.5 mL serum

Stability (from collection to initiation):
Room temperature, refrigerated or frozen: 14 days
Freeze/thaw cycles: Stable x 3

Storage/Transport Temperature:
Room temperature, refrigerated or frozen

PROCESSING

Test Code:
MOLT

Sendout:
Yes

Performing Lab:
LabCorp

Specimen Preparation:
Transport to China Basin. LabCorp test code 070121.

Note: This test/test code is not independently listed in LabCorp's online test menu; this test is available through special agreement between UCSF and LabCorp.

Preferred Volume:
1.5 mL serum
Minimum Volume:
1.5 mL serum

Stability (from collection to initiation):
  Room temperature, refrigerated or frozen: 14 days
  Freeze/thaw cycles: Stable x 3

Storage/Transport Temperature:
  Room temperature, refrigerated or frozen

RESULT INTERPRETATION

Units:
ng/mL

Additional Information:
The functional sensitivity of this assay is 0.2 ng/mL.

Interpretive Data:
Rare amino acid sequence mutations within Tg could potentially cause a false-low result in the Tg LC/MS-MS assay, if the sequence variation occurs within the tryptic peptide measured by the assay or eliminates the tryptic cleavage site. In the heterozygote state, the result would be an apparent reduction in Tg concentration by about 50%, while the homozygous state no TG would be detected.

ADMINISTRATIVE

CPT Codes:
84432

LOINC Codes:
3013-0

COMPLETE VIEW

Ordering Recommendations:
This test is intended for patients with a known thyroglobulin or heterophile antibody that could interfere with our in-house ultrasensitive thyroglobulin immunoassays.

Note: Isolated LC/MS-MS testing is not listed in LabCorp's online test menu; this testing has been specifically arranged between LabCorp and UCSF.

Test Code:
MOLT

Performing Lab:
LabCorp

Sendout:
Yes

Performed:
Varies

Methodology:
LD/MS-MS

Collect:
Gold-top or red-top tube

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
1.5 mL serum

Minimum Volume:
1.5 mL serum

Specimen Preparation:
Transport to China Basin. LabCorp test code 070121.
Note: This test/test code is not independently listed in LabCorp's online test menu; this test is available through special agreement between UCSF and LabCorp.

**Units:**

ng/mL

**Interpretive Data:**

Rare amino acid sequence mutations within Tg could potentially cause a false-low result in the Tg LC/MS-MS assay, if the sequence variation occurs within the tryptic peptide measured by the assay or eliminates the tryptic cleavage site. In the heterozygote state, the result would be an apparent reduction in Tg concentration by about 50%, while the homozygous state no TG would be detected.

**Storage/Transport Temperature:**

Room temperature, refrigerated or frozen

**Stability (from collection to initiation):**

Room temperature, refrigerated or frozen: 14 days

Freeze/thaw cycles: Stable x 3

**Reported:**

Varies

**Additional Information:**

The functional sensitivity of this assay is 0.2 ng/mL.

**CPT Codes:**

84432

**LOINC Codes:**

3013-0
Thyroglobulin, Ultrasensitive (Tumor Marker; includes anti-Tg Ab testing)
TGA

ORDERING

Available Stat:
No
Performing Lab:
  Parnassus Chemistry (for Thyroglobulin)
  China Basin Chemistry (for Thyroglobulin Ab)
Performed:
  Tuesday, Friday (day shift)
Methodology:
  Immunoenzymatic assay - Beckman Access assay on Unicel Dxl 600 (for Thyroglobulin)
  Chemiluminescent Microparticle Immunoassay - Abbott Architect i2000 (for Thyroglobulin Ab)
Reported:
  1-5 days
Additional Information:
  Samples tested for thyroglobulin will automatically be screened for the presence of thyroglobulin antibodies using a sensitive assay for anti-thyroglobulin antibodies (see TGLB Antibodies, test code TGAB). The presence of anti-thyroglobulin antibodies can interfere in this thyroglobulin assay and may cause falsely decreased results.
  Note: Potential of falsely decreased thyroglobulin results when biotin concentrations are >10ng/mL. Interpret the results in light of the total clinical presentation of the patient.
  Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.
  The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer's reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately 20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV cutoff) are reported as <2.00.
  Thyroglobulin results obtained with this assay should not be compared to results generated with other thyroglobulin assays owing to differences in assay design and calibration. In this Beckman Access assay on the Unicel Dxi platform, the functional sensitivity defined as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified in house and in other laboratories to be < 0.1 μg/L (Malandrino et al, J Clin Endocrinol Metab 2011). Results below 0.1 μg/L are reported as < 0.1 μg/L.
  Thyroglobulin levels are useful to assess the presence of residual differentiated thyroid carcinoma. Athyrotic individuals should have extremely low to undetectable levels of thyroglobulin. Increasing levels indicate possible recurrence or metastasis. Levels are not elevated in medullary or anaplastic thyroid carcinomas nor with small tumors, and are generally not useful as a routine screening test for thyroid cancer.
  Normal reference ranges were adopted from the literature and verified in house by measuring thyroglobulin in serum from 138 healthy blood donors with normal TSH levels and negative for anti-thyroglobulin antibodies and anti-TPO antibodies (Giovanella et al. Clin Chem Lab Med, 2011).
Synonyms:
  • Tg
  • TGLB

COLLECTION

Sample Type:
  Serum
Collect:
  Red top or Gold top
Amount to Collect:
3 mL blood

Preferred Volume:
1.1 mL serum

Minimum Volume:
1.0 mL serum

Stability (from collection to initiation):
Refrigerated 1 week frozen -20°C 1 month

PROCESSING

Test Code:
TGA

Test Group:
Thyroid tests

Performing Lab:
Parnassus Chemistry (for Thyroglobulin)
China Basin Chemistry (for Thyroglobulin Ab)

Specimen Preparation:
Refrigerate serum.

Preferred Volume:
1.1 mL serum

Minimum Volume:
1.0 mL serum

Stability (from collection to initiation):
Refrigerated 1 week frozen -20°C 1 month

RESULT INTERPRETATION

Units:
Thyroglobulin Ab screen IU/mL Thyroglobulin µg/L

Reference Interval:
Thyroglobulin:
Male: 1.4-29.2 µg/L
Female: 1.5-38.5 µg/L

Thyroglobulin Ab*: < 2.00 IU/mL

*Reference range is based on the functional CV cutoff (20% CV cutoff) for the assay estimated by monitoring the CV in low end patient pools and samples tested over periods of 1 - 6 months. This functional CV cutoff is in accord with that reported by Pickett et al, Ann Clin Biochem, 49:463-467, 2012 for the Abbott Architect assay. Approximately 80% of healthy subjects with normal thyroid function tests and no thyroperoxidase antibodies will have an anti-TG antibody level < 2.00 IU/mL in this assay. The normal range cutoff has been set at the lower reporting limit of the assay (functional CV cutoff) in accordance with the view that any detectable level of anti-thyroglobulin antibody may be considered abnormal and might negatively interfere in the thyroglobulin assay.

Additional Information:
Samples tested for thyroglobulin will automatically be screened for the presence of thyroglobulin antibodies using a sensitive assay for anti-thyroglobulin antibodies (see TGLB Antibodies, test code TGAB). The presence of anti-thyroglobulin antibodies can interfere in this thyroglobulin assay and may cause falsely decreased results.

Note: Potential of falsely decreased thyroglobulin results when biotin concentrations are >10 ng/mL. Interpret the results in light of the total clinical presentation of the patient.

Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.

The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer's reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately
20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV
cutoff) are reported as <2.00.

Thyroglobulin results obtained with this assay should not be compared to results generated with other thyroglobulin assays owing to
differences in assay design and calibration. In this Beckman Access assay on the Unicel Dxi platform, the functional sensitivity defined
as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified
in house and in other laboratories to be < 0.1 µg/L (Malandrino et al, J Clin Endocrinol Metab 2011). Results below 0.1 µg/L are reported
as < 0.1 µg/L

Thyroglobulin levels are useful to assess the presence of residual differentiated thyroid carcinoma. Athyrotic individuals should have
extremely low to undetectable levels of thyroglobulin. Increasing levels indicate possible recurrence or metastasis. Levels are not
elevated in medullary or anaplastic thyroid carcinomas nor with small tumors, and are generally not useful as a routine screening test for
thyroid cancer.

Normal reference ranges were adopted from the literature and verified in house by measuring thyroglobulin in serum from 138 healthy
blood donors with normal TSH levels and negative for anti-thyroglobulin antibodies and anti-TPO antibodies (Giovanella et al. Clin

ADMINISTRATIVE

CPT Codes:
Thyroglobulin Ab Screen: 86800-90
Thyroglobulin, Tumor Marker: 84432-90

LOINC Codes:
3013-0

COMPLETE VIEW

Available Stat:
No

Test Code:
TGA

Test Group:
Thyroid tests

Performing Lab:
Parnassus Chemistry (for Thyroglobulin)
China Basin Chemistry (for Thyroglobulin Ab)

Performed:
Tuesday, Friday (day shift)

Methodology:
Immuonoenzymatic assay - Beckman Access assay on Unicel DxI 600 (for Thyroglobulin)
Chemiluminescent Microparticle Immunoassay - Abbott Architect i2000 (for Thyroglobulin Ab)

Collect:
Red top or Gold top

Amount to Collect:
3 mL blood

Sample Type:
Serum

Preferred Volume:
1.1 mL serum

Minimum Volume:
1.0 mL serum

Specimen Preparation:
Refrigerate serum.

Units:
Thyroglobulin Ab screen IU/mL Thyroglobulin µg/L

Reference Interval:
Thyroglobulin:
**Male: 1.4-29.2 µg/L**
**Female: 1.5-38.5 µg/L**

**Thyroglobulin Ab*: < 2.00 IU/mL**

*Reference range is based on the functional CV cutoff (20% CV cutoff) for the assay estimated by monitoring the CV in low end patient pools and samples tested over periods of 1 - 6 months. This functional CV cutoff is in accord with that reported by Pickett et al, Ann Clin Biochem, 49:463-467, 2012 for the Abbott Architect assay. Approximately 80% of healthy subjects with normal thyroid function tests and no thyroperoxidase antibodies will have an anti-TG antibody level < 2.00 IU/mL in this assay. The normal range cutoff has been set at the lower reporting limit of the assay (functional CV cutoff) in accordance with the view that any detectable level of anti-thyroglobulin antibody may be considered abnormal and might negatively interfere in the thyroglobulin assay.

**Synonyms:**
- Tg
- TGLB

**Stability (from collection to initiation):**
- Refrigerated 1 week frozen -20C 1 month

**Reported:**
- 1-5 days

**Additional Information:**
Samples tested for thyroglobulin will automatically be screened for the presence of thyroglobulin antibodies using a sensitive assay for anti-thyroglobulin antibodies (see TGLB Antibodies, test code TGAB). The presence of anti-thyroglobulin antibodies can interfere in this thyroglobulin assay and may cause falsely decreased results.

Note: Potential of falsely decreased thyroglobulin results when biotin concentrations are >10ng/mL. Interpret the results in light of the total clinical presentation of the patient.

Note: Assays for anti-thyroglobulin antibodies are not well standardized and results with this Abbott Architect assay should not be directly compared with the results of other anti-thyroglobulin antibody assays.

The Architect anti-thyroglobulin assay is more sensitive for detection of anti-TG antibodies than other commonly used anti-TG antibody assays including the Siemens Immulite assay when using cutoffs based on the manufacturer's reference range or functional CV cutoff in some cases (Pickett et al. Annals of Clinical Biochemistry 49:463-467, 2012). The coefficient of variation of this assay is approximately 20% at a level of 2.00 IU/mL and approximately 6% at a level of 4.11 IU/mL. Results below the functional CV cutoff of 2.00 (20% CV cutoff) are reported as <2.00.

Thyroglobulin results obtained with this assay should not be compared to results generated with other thyroglobulin assays owing to differences in assay design and calibration. In this Beckman Access assay on the Unicel Dxi platform, the functional sensitivity defined as the lowest value that can be measured in thyroglobulin-negative antibody serum with a 20% coefficient of variation has been verified in house and in other laboratories to be < 0.1 µg/L (Malandrino et al, J Clin Endocrinol Metab 2011). Results below 0.1 µg/L are reported as < 0.1 µg/L

Thyroglobulin levels are useful to assess the presence of residual differentiated thyroid carcinoma. Athyrotic individuals should have extremely low to undetectable levels of thyroglobulin. Increasing levels indicate possible recurrence or metastasis. Levels are not elevated in medullary or anaplastic thyroid carcinomas nor with small tumors, and are generally not useful as a routine screening test for thyroid cancer.

Normal reference ranges were adopted from the literature and verified in house by measuring thyroglobulin in serum from 138 healthy blood donors with normal TSH levels and negative for anti-thyroglobulin antibodies and anti-TPO antibodies (Giovanella et al. Clin Chem Lab Med, 2011).

**CPT Codes:**
- Thyroglobulin Ab Screen: 86800-90
- Thyroglobulin, Tumor Marker: 84432-90

**LOINC Codes:**
- 3013-0
Thyroid Stimulating Hormone
TSH

ORDERING

Available Stat:
No
Performing Lab:
Chemistry China Basin
Performed:
Test performed Monday-Saturday (day shift)
Methodology:
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)
Reported:
0-2 days
Additional Information:
According to the assay manufacturer the low end functional sensitivity (20% coefficient of variation cutoff) for this assay is 0.01 mIU/L.
Synonyms:
• TSH
• Thyrotropin

COLLECTION

Sample Type:
Serum or heparinized plasma
Collect:
Gold top or Light Green top
Amount to Collect:
1.6 mL blood
Preferred Volume:
0.6 mL serum or heparinized plasma
Minimum Volume:
0.4 mL serum or heparinized plasma

PROCESSING

Test Code:
TSH
Test Group:
Thyroid tests
Performing Lab:
Chemistry China Basin
Specimen Preparation:
Refrigerate.
Preferred Volume:
0.6 mL serum or heparinized plasma
Minimum Volume:
0.4 mL serum or heparinized plasma

RESULT INTERPRETATION

Units:
mIU/L
Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference range (mIU/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 months</td>
<td>1.12-6.31</td>
</tr>
<tr>
<td>2 months to &lt;6 months</td>
<td>0.73-4.77</td>
</tr>
<tr>
<td>6 months to &lt;12 years</td>
<td>0.67-4.44</td>
</tr>
<tr>
<td>12 years to &lt;18 years</td>
<td>0.50-4.33</td>
</tr>
<tr>
<td>18 years and above</td>
<td>0.45-4.12</td>
</tr>
</tbody>
</table>

Reference ranges apply to non-pregnant individuals. In pregnant subjects, TSH levels decline in the first trimester and then rise after 10-12 weeks gestation. The upper reference limit is 2.5 mIU/L in the first trimester, 3.0 in the second trimester, and 3.5 mIU/L in the third trimester. The lower reference limit for TSH in pregnancy is 0.1 - 0.2 mIU/L lower than the range limit in non-pregnant subjects (Garber JR et al. Clinical Practice Guidelines for Hypothyroidism in Adults: American Association of Clinical Endocrinologists and the American Thyroid Association, Thyroid 12:1200-1235, 2012).

Pediatric reference ranges adopted from Pediatric Reference Intervals seventh edition (Soldin, Steven J. et al) and the Canadian Laboratory Initiative on Reference Interval Database (CALIPER) study, Clinical Chemistry September 2013 vol. 59 no. 9 1393-1405.

Neonatal and cord blood levels are 2-4x higher than levels at >= 2 weeks of age through adult life. Neonatal levels are also screened by the State program.


Additional Information:
According to the assay manufacturer the low end functional sensitivity (20% coefficient of variation cutoff) for this assay is 0.01 mIU/L.

**Administrative**

CPT Codes:
- 84443

LOINC Codes:
- 3016-3

**Complete View**

Available Stat:
- No

Test Code:
- TSH

Test Group:
- Thyroid tests

Performing Lab:
- Chemistry China Basin

Performed:
- Test performed Monday-Saturday (day shift)

Methodology:
- Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect:
- Gold top or Light Green top

Amount to Collect:
- 1.6 mL blood

Sample Type:
- Serum or heparinized plasma

Preferred Volume:
- 0.6 mL serum or heparinized plasma

Minimum Volume:
0.4 mL serum or heparinized plasma

**Specimen Preparation:**
Refrigerate.

**Units:**
mIU/L

**Reference Interval:**

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference range (mIU/L)</th>
</tr>
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<tbody>
<tr>
<td>&lt;2 months</td>
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<tr>
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</tr>
<tr>
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Reference ranges apply to non-pregnant individuals. In pregnant subjects, TSH levels decline in the first trimester and then rise after 10 -12 weeks gestation. The upper reference limit is 2.5 mIU/L in the first trimester, 3.0 in the second trimester, and 3.5 mIU/L in the third trimester. The lower reference limit for TSH in pregnancy is 0.1 - 0.2 mIU/L lower than the range limit in non-pregnant subjects (Garber JR et al. Clinical Practice Guidelines for Hypothyroidism in Adults: American Association of Clinical Endocrinologists and the American Thyroid Association, Thyroid 12:1200-1235, 2012).

Pediatric reference ranges adopted from Pediatric Reference Intervals seventh edition (Soldin, Steven J. et al) and the Canadian Laboratory Initiative on Reference Interval Database (CALIPER) study, Clinical Chemistry September 2013 vol. 59 no. 9 1393-1405.

Neonatal and cord blood levels are 2-4x higher than levels at >= 2 weeks of age through adult life. Neonatal levels are also screened by the State program.


**Synonyms:**
- TSH
- Thyrotropin

**Reported:**
0 -2 days

**Additional Information:**
According to the assay manufacturer the low end functional sensitivity (20% coefficient of variation cutoff) for this assay is 0.01 mIU/L.

**CPT Codes:**
84443

**LOINC Codes:**
3016-3
Thyroid Stimulating Immunoglobulin

TSI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Immunoassay
Reported:
Set up 5 days per week. Turnaround 3-6 days
Additional Information:
A positive result is one in which the Specimen to Reference Ratio (%) (SSR%) is >140% of the Reference Control.
Thyroid stimulating immunoglobulins (TSI) can engage the TSH receptors resulting in hyperthyroidism in Graves' disease patients. TSI levels can be useful in monitoring the clinical outcome of Graves' disease as well as assessing the potential for hyperthyroidism from maternal-fetal transfer.

NOTE: A serum TSH level greater than 350 µIU/mL can interfere with the TSI bioassay and potentially give false positive results.

Synonyms:
- TSI
- TSH receptor antibodies
- Human Thyroid Stimulator (HTS)
- Long-Acting Thyroid Stimulator (LATS)
- Thyroid-Stimulating Antibody (TSAb)

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top
Amount to Collect:
4 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.2 mL serum
Stability (from collection to initiation):
Refrigerated 3 weeks, frozen at -20C 2 months.
Unacceptable Conditions:
Gross hemolysis, gross lipemia, grossly icteric samples
Rejection Criteria:
Gross hemolysis, gross lipemia, grossly icteric samples

PROCESSING

Test Code:
TSI
Test Group:
Thyroid tests
Sendout: 
  Yes
Performing Lab:  
  Quest
Specimen Preparation:  
  Freeze at -20C. Order Quest # 30551
Preferred Volume:  
  1 mL serum
Minimum Volume:  
  0.2 mL serum
Unacceptable Conditions:  
  Gross hemolysis, gross lipemia, grossly icteric samples
Rejection Criteria:  
  Gross hemolysis, gross lipemia, grossly icteric samples
Stability (from collection to initiation):  
  Refrigerated 3 weeks, frozen at -20C 2 months.

RESULT INTERPRETATION

Units:  
  % of baseline
Reference Interval:  
  Negative <140% of baseline (See Additional information)
Additional Information:  
  A positive result is one in which the Specimen to Reference Ratio (%) (SSR%) is >140% of the Reference Control.
  Thyroid stimulating immunoglobulins (TSI) can engage the TSH receptors resulting in hyperthyroidism in Graves' disease patients. TSI levels can be useful in monitoring the clinical outcome of Graves' disease as well as assessing the potential for hyperthyroidism from maternal-fetal transfer.

NOTE: A serum TSH level greater than 350 µIU/mL can interfere with the TSI bioassay and potentially give false positive results.

ADMINISTRATIVE

CPT Codes:  
  84445-90
LOINC Codes:  
  30567-2

COMPLETE VIEW

Available Stat:  
  No
Test Code:  
  TSI
Test Group:  
  Thyroid tests
Performing Lab:  
  Quest
Sendout:  
  Yes
Methodology:  
  Immunoassay
Collect:  
  Gold top, Red top
Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.2 mL serum

Rejection Criteria:
Gross hemolysis, gross lipemia, grossly icteric samples

Unacceptable Conditions:
Gross hemolysis, gross lipemia, grossly icteric samples

Specimen Preparation:
Freeze at -20C. Order Quest # 30551

Units:
% of baseline

Reference Interval:
Negative <140% of baseline (See Additional information)

Synonyms:
- TSI
- TSH receptor antibodies
- Human Thyroid Stimulator (HTS)
- Long-Acting Thyroid Stimulator (LATS)
- Thyroid-Stimulating Antibody (TSAb)

Stability (from collection to initiation):
Refrigerated 3 weeks, frozen at -20C 2 months.

Reported:
Set up 5 days per week. Turnaround 3-6 days

Additional Information:
A positive result is one in which the Specimen to Reference Ratio (%) (SSR%) is >140% of the Reference Control.

Thyroid stimulating immunoglobulins (TSI) can engage the TSH receptors resulting in hyperthyroidism in Graves' disease patients. TSI levels can be useful in monitoring the clinical outcome of Graves' disease as well as assessing the potential for hyperthyroidism from maternal-fetal transfer.

NOTE: A serum TSH level greater than 350 µIU/mL can interfere with the TSI bioassay and potentially give false positive results.

CPT Codes:
84445-90

LOINC Codes:
30567-2
Thyroperoxidase Antibodies
ATPO

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Tuesday (day shift)
Methodology: Enzyme-Linked Immunosorbent Assay (ELISA)
Reported: 1-8 days

Additional Information:
The results of this test should be used in conjunction with clinical findings and other laboratory data (such as TSH and thyroid hormone levels) to make a diagnosis of autoimmune thyroid disease (including Hashimoto's thyroiditis and Graves' Disease). Although anti-thyroperoxidase antibodies are a sensitive and specific indicator of autoimmune thyroid disease, a subset of normal individuals may have low level antibodies that may not have clinical significance resulting in a false positive test result. The Manufacturer's guidelines suggest that up to 4-5% of normal individuals may have a positive result with this assay.

The antibody reactivity previously ascribed to the thyroid microsomes is now recognized to be primarily directed against Thyroperoxidase, and is the antibody activity most commonly found in thyroid disease.

Synonyms:
- anti-TPO antibodies
- anti-microsomal antibodies

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Avoid hemolysis
Unacceptable Conditions: Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code: ATPO
Test Group: Thyroid tests
Performing Lab: Immunology
Specimen Preparation:
Stored frozen at -20C.

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.5 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed, lipemic or icteric samples

---

### RESULT INTERPRETATION

**Units:**
WHO units

**Reference Interval:**
- Negative: <= 100 WHO units
- Positive: > 100 WHO units

**Additional Information:**
The results of this test should be used in conjunction with clinical findings and other laboratory data (such as TSH and thyroid hormone levels) to make a diagnosis of autoimmune thyroid disease (including Hashimoto's thyroiditis and Graves' Disease). Although anti-thyroperoxidase antibodies are a sensitive and specific indicator of autoimmune thyroid disease, a subset of normal individuals may have low level antibodies that may not have clinical significance resulting in a false positive test result. The Manufacturer's guidelines suggest that up to 4-5% of normal individuals may have a positive result with this assay.

The antibody reactivity previously ascribed to the thyroid microsomes is now recognized to be primarily directed against Thyroperoxidase, and is the antibody activity most commonly found in thyroid disease.

---

### ADMINISTRATIVE

**CPT Codes:**
86376

**LOINC Codes:**
8099-4

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### COMPLETE VIEW

**Available Stat:**
No

**Test Code:**
ATPO

**Test Group:**
Thyroid tests

**Performing Lab:**
Immunology

**Performed:**
Tuesday (day shift)

**Methodology:**
- Enzyme-Linked Immunosorbent Assay (ELISA)

**Remarks:**
Avoid hemolysis

**Collect:**
Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum
**Minimum Volume:**
0.5 mL serum

**Unacceptable Conditions:**
Grossly hemolyzed, lipemic or icteric samples

**Specimen Preparation:**
Stored frozen at -20°C.

**Units:**
WHO units

**Reference Interval:**
- Negative: <= 100 WHO units
- Positive: > 100 WHO units

**Synonyms:**
- anti-TPO antibodies
- anti-microsomal antibodies

**Reported:**
1-8 days

**Additional Information:**
The results of this test should be used in conjunction with clinical findings and other laboratory data (such as TSH and thyroid hormone levels) to make a diagnosis of autoimmune thyroid disease (including Hashimoto's thyroiditis and Graves' Disease). Although anti-thyroid peroxidase antibodies are a sensitive and specific indicator of autoimmune thyroid disease, a subset of normal individuals may have low level antibodies that may not have clinical significance resulting in a false positive test result. The Manufacturer's guidelines suggest that up to 4-5% of normal individuals may have a positive result with this assay.

The antibody reactivity previously ascribed to the thyroid microsomes is now recognized to be primarily directed against Thyroid peroxidase, and is the antibody activity most commonly found in thyroid disease.

**CPT Codes:**
86376

**LOINC Codes:**
8099-4
# Thyrotropin Binding Inhibitory Immunoglobulin

**TBII**

## ORDERING

<table>
<thead>
<tr>
<th>Available Stat:</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performing Lab:</td>
<td>Quest</td>
</tr>
<tr>
<td>Methodology:</td>
<td>Radioreceptor Assay</td>
</tr>
<tr>
<td>Reported:</td>
<td>Test run Tuesday &amp; Friday. Turnaround 6-8 days.</td>
</tr>
<tr>
<td>Additional Information:</td>
<td>The reported value is the percent inhibition of 125I-TSH binding to the thyroid TSH receptor.</td>
</tr>
</tbody>
</table>

### Synonyms:
- TBII
- thyroid receptor antibody
- TSH receptor antibody
- TSH receptor blocking antibody

## COLLECTION

| Sample Type: | Serum |
| Collect: | Gold top |
| Amount to Collect: | 2 mL blood |
| Preferred Volume: | 1 mL serum |
| Minimum Volume: | 1 mL serum |
| Stability (from collection to initiation): | Room temperature 2 days, refrigerates 1 week, frozen 1 month. |

## PROCESSING

| Test Code: | TBII |
| Sendout: | Yes |
| Performing Lab: | Quest |
| Specimen Preparation: | Freeze sample. Order Quest # 5738 |
| Preferred Volume: | 1 mL serum |
| Minimum Volume: | 1 mL serum |
| Stability (from collection to initiation): | Room temperature 2 days, refrigerates 1 week, frozen 1 month. |
RESULT INTERPRETATION

Units:
% inhibition
Reference Interval:
Normal: < 16% inhibition
Additional Information:
The reported value is the percent inhibition of 125I-TSH binding to the thyroid TSH receptor.

ADMINISTRATIVE

CPT Codes:
83519-90
LOINC Codes:
40673-6

COMPLETE VIEW

Available Stat:
No
Test Code:
TBII
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Radioreceptor Assay
Collect:
Gold top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
1 mL serum
Specimen Preparation:
Freeze sample. Order Quest # 5738
Units:
% inhibition
Reference Interval:
Normal: < 16% inhibition
Synonyms:
- TBII
- thyroid receptor antibody
- TSH receptor antibody
- TSH receptor blocking antibody
Stability (from collection to initiation):
Room temperature 2 days, refrigerates 1 week, frozen 1 month.
Reported:
Test run Tuesday & Friday. Turnaround 6-8 days.

Printed 06/07/19
Test information subject to change
Additional Information:
The reported value is the percent inhibition of 125I-TSH binding to the thyroid TSH receptor.

CPT Codes:
83519-90

LOINC Codes:
40673-6
Thyroxine Binding Globulin
TBG

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Chemiluminescence
Reported:
Test performed Wednesday, Friday & Sunday. Turnaround time: 1-4 days.
Additional Information:
TBG binds T4 and T3 (T4 more tightly than T3), and carries 70% of the thyroid hormone in the blood. It is indirectly estimated with Thyroid Uptake. Direct measurement is useful only for rare conditions such as congenital deficiency or excess of TBG
Synonyms:
- TBG
- T4 binding globulin

COLLECTION

Sample Type:
Serum
Collect:
Red top (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen at -20°C 1 month.
Unacceptable Conditions:
Collected in Gold top.

PROCESSING

Test Code:
TBG
Test Group:
Thyroid tests
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum at -20°C. Order Quest # 30213P. For B&T patients order BTMOLT, LabCorp Test # 001735
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
Collected in Gold top.

Stability (from collection to initiation):
Room temperature 1 week, refrigerated 1 week, frozen at -20°C 1 month.

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:

- 4-6 years  14.8-32.9 µg/mL
- 7-8 years  16.3-30.7 µg/mL
- 9-10 years  15.8-27.4 µg/mL
- 11 years  15.5-27.4 µg/mL
- 12 years  14.8-26.2 µg/mL
- 13 years  13.8-25.2 µg/mL
- 14 years  12.2-25.2 µg/mL
- 15 years  10.8-23.8 µg/mL
- 16 years  10.0-23.8 µg/mL
- 17 years  8.5-23.1 µg/mL

Tanner Stages Males  Females
Stage I  13.5-28.4 µg/mL  14.2-28.5 µg/mL
Stage II  15.1-25.9 µg/mL  15.0-23.1 µg/mL
Stage III  14.0-26.3 µg/mL  13.7-23.0 µg/mL
Stage IV  13.2-25.0 µg/mL  12.0-22.8 µg/mL
Stage V  12.2-23.7 µg/mL  9.1-22.8 µg/mL

>= 18 year old females  13.5-30.9 µg/mL
>= 18 year old males  12.7-25.1 µg/mL

To convert to nmol/L, multiply the result by 18.5.

Additional Information:
TBG binds T4 and T3 (T4 more tightly than T3), and carries 70% of the thyroid hormone in the blood. It is indirectly estimated with Thyroid Uptake. Direct measurement is useful only for rare conditions such as congenital deficiency or excess of TBG.

ADMINISTRATIVE

CPT Codes:
84442-90

LOINC Codes:
3021-3

COMPLETE VIEW

Available Stat:
No

Test Code:
TBG

Test Group:
Thyroid tests

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Chemiluminescence

Collect:
   Red top (Gold top NOT acceptable)

Amount to Collect:
   2 mL blood

Sample Type:
   Serum

Preferred Volume:
   1 mL serum

Minimum Volume:
   0.5 mL serum

Unacceptable Conditions:
   Collected in Gold top.

Specimen Preparation:
   Freeze serum at -20°C. Order Quest # 30213P. For B&T patients order BTMOLT, LabCorp Test # 001735

Units:
   µg/mL (mcg/mL)

Reference Interval:
   
<table>
<thead>
<tr>
<th>Age</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6 years</td>
<td>14.8-32.9 µg/mL</td>
</tr>
<tr>
<td>7-8 years</td>
<td>16.3-30.7 µg/mL</td>
</tr>
<tr>
<td>9-10 years</td>
<td>15.8-27.4 µg/mL</td>
</tr>
<tr>
<td>11 years</td>
<td>15.5-27.4 µg/mL</td>
</tr>
<tr>
<td>12 years</td>
<td>14.8-26.2 µg/mL</td>
</tr>
<tr>
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</tr>
<tr>
<td>14 years</td>
<td>12.2-25.2 µg/mL</td>
</tr>
<tr>
<td>15 years</td>
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</tr>
<tr>
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<tr>
<td>17 years</td>
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</tbody>
</table>

   Tanner Stages Males       Females
   Stage I   13.5-28.4 µg/mL 14.2-28.5 µg/mL
   Stage II  15.1-25.9 µg/mL 15.0-23.1 µg/mL
   Stage III 14.0-26.3 µg/mL 13.7-23.0 µg/mL
   Stage IV  13.2-25.0 µg/mL 12.0-22.8 µg/mL
   Stage V   12.2-23.7 µg/mL 9.1-22.8 µg/mL

   >= 18 year old females 13.5-30.9 µg/mL
   >= 18 year old males  12.7-25.1 µg/mL

   To convert to nmol/L, multiply the result by 18.5.

Synonyms:
   - TBG
   - T4 binding globulin

Stability (from collection to initiation):
   Room temperature 1 week, refrigerated 1 week, frozen at -20°C 1 month.

Reported:
   Test performed Wednesday, Friday & Sunday. Turnaround time: 1-4 days.

Additional Information:
   TBG binds T4 and T3 (T4 more tightly than T3), and carries 70% of the thyroid hormone in the blood. It is indirectly estimated with Thyroid Uptake. Direct measurement is useful only for rare conditions such as congenital deficiency or excess of TBG

CPT Codes:
   84442-90

LOINC Codes:
   3021-3
**Tissue Immunofluorescence-IgA Antibody**

**UCSF**

### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- IF Lab

**Methodology:**
- Indirect Immunofluorescence

**Reported:**
- Test performed Monday. Turn-around time: 5-10 days

**Additional Information:**
- Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy. For questions contact the UCSF Immunofluorescence Lab at 353-7546.

### COLLECTION

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Remarks:**
- Samples should be received by the laboratory by Wednesday for next Monday signout.

**Stability (from collection to initiation):**
- Sample is stable at RT.

### PROCESSING

**Test Code:**
- UCSF

**Performing Lab:**
- IF Lab

**Specimen Preparation:**
- Send sample and completed dermatopathology requisition to: UCSF Dermatopathology office, Mount Zion Campus 1701 Divisadero St. 3rd floor Room 350, San Francisco, CA 94115.

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 1 mL serum

**Stability (from collection to initiation):**
- Sample is stable at RT.
Units:

Titer

Reference Interval:

Negative Titer < 1:10

Additional Information:

Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy. For questions contact the UCSF Immunofluorescence Lab at 353-7546.

Available Stat:

No

Test Code:

UCSF

Performing Lab:

IF Lab

Methodology:

Indirect Immunofluorescence

Remarks:

Samples should be received by the laboratory by Wednesday for next Monday signout.

Collect:

Gold top

Amount to Collect:

4 mL blood

Sample Type:

Serum

Preferred Volume:

2 mL serum

Minimum Volume:

1 mL serum

Specimen Preparation:

Send sample and completed dermatopathology requisition to: UCSF Dermatopathology office, Mount Zion Campus 1701 Divisadero St. 3rd floor Room 350, San Francisco, CA 94115.

Units:

Titer

Reference Interval:

Negative Titer < 1:10

Stability (from collection to initiation):

Sample is stable at RT.

Reported:

Test performed Monday. Turn-around time: 5-10 days

Additional Information:

Identifies the presence of serum antibodies against intercellular substance in squamous epithelium (pemphigus vulgaris) or basement membrane (bullous pemphigoid). Nuclear staining may be seen from sera of patients with systemic lupus or other connective tissue disorders. Antibodies are typically present during active disease. If positive it is advisable to perform direct immunofluorescent testing on biopsies of skin lesions. A two-fold drop in titer is indicative of effective therapy. For questions contact the UCSF Immunofluorescence Lab at 353-7546.
Tissue Transglutaminase Antibody, IgA
TTGT

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Tuesday (day shift)
Methodology: Chemiluminescent
Reported: 2-8 days

Additional Information:
This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). The European Society for Pediatric Gastroenterology and Nutrition (ESPGAN) revised criteria in 1990 for diagnosis of celiac disease in children to include serologic testing for IgA endomysial antibodies.

Tissue transglutaminase has been identified as the primary target for IgA endomysial antibodies. IgA tissue transglutaminase (TTG) antibodies are thought to be equally sensitive for celiac disease in comparison with anti-gliadin antibodies but with increased specificity. Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated. IgA TTG antibodies most often disappear when patients adhere to a gluten-free diet, thus this test may be useful in monitoring patient adherence to diet. Since IgA-deficiency is not uncommon in patients with celiac disease, serum IgA levels may be ordered to confirm a negative result on this test.

Synonyms:
- Celiac disease
- endomysial antibody

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Avoid hemolysis

Unacceptable Conditions:
- Grossly hemolyzed, lipemic or icteric specimens

PROCESSING

Test Code: TTGT
Performing Lab: Immunology
Specimen Preparation:
- Freeze serum at -20C.
Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
- Grossly hemolyzed, lipemic or icteric specimens

RESULT INTERPRETATION

Units:
Chemiluminescent Units (CU)

Reference Interval:
- Negative: < 20 CU
- Weak Positive: 20 - 30 CU
- Positive: > 30 CU

Additional Information:
This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). The European Society for Pediatric Gastroenterology and Nutrition (ESPGAN) revised criteria in 1990 for diagnosis of celiac disease in children to include serologic testing for IgA endomysial antibodies.

Tissue transglutaminase has been identified as the primary target for IgA endomysial antibodies. IgA tissue transglutaminase (TTG) antibodies are thought to be equally sensitive for celiac disease in comparison with anti-gliadin antibodies but with increased specificity. Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated. IgA TTG antibodies most often disappear when patients adhere to a gluten-free diet, thus this test may be useful in monitoring patient adherence to diet. Since IgA-deficiency is not uncommon in patients with celiac disease, serum IgA levels may be ordered to confirm a negative result on this test.

ADMINISTRATIVE

CPT Codes:
- 83520

LOINC Codes:
- 31017-7

COMPLETE VIEW

Available Stat:
No

Test Code:
TTGT

Performing Lab:
Immunology

Performed:
Tuesday (day shift)

Methodology:
Chemiluminescent

Remarks:
- Avoid hemolysis

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
0.5 mL serum

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric specimens

**Specimen Preparation:**
- Freeze serum at -20°C.

**Units:**
- Chemiluminescent Units (CU)

**Reference Interval:**
- Negative: < 20 CU
- Weak Positive: 20 - 30 CU
- Positive: > 30 CU

**Synonyms:**
- Celiac disease
- Endomysial antibody

**Reported:**
- 2-8 days

**Additional Information:**
This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). The European Society for Pediatric Gastroenterology and Nutrition (ESPGAN) revised criteria in 1990 for diagnosis of celiac disease in children to include serologic testing for IgA endomysial antibodies.

Tissue transglutaminase has been identified as the primary target for IgA endomysial antibodies. IgA tissue transglutaminase (TTG) antibodies are thought to be equally sensitive for celiac disease in comparison with anti-gliadin antibodies but with increased specificity. Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated. IgA TTG antibodies most often disappear when patients adhere to a gluten-free diet, thus this test may be useful in monitoring patient adherence to diet. Since IgA-deficiency is not uncommon in patients with celiac disease, serum IgA levels may be ordered to confirm a negative result on this test.

**CPT Codes:**
- 83520

**LOINC Codes:**
- 31017-7
Tissue Transglutaminase Antibody, IgG
TTGTGG

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Performed Friday day shift
Methodology: Chemiluminescent
Reported: 2-8 days
Additional Information: This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated.
Synonyms: • Celiac disease
• Endomysial antibody

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Remarks: Avoid hemolysis
Unacceptable Conditions: Gross Hemolyzed, lipemic or icteric samples

PROCESSING

Test Code: TTGTGG
Performing Lab: Immunology
Specimen Preparation: Freeze serum at -20°C
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Unacceptable Conditions: Gross Hemolyzed, lipemic or icteric samples
RESULT INTERPRETATION

Units:
Chemiluminescent Units (CU)

Reference Interval:
- Negative: < 20.0 CU
- Weak Positive: 20.0-30.0 CU
- Positive: > 30.0 CU

Additional Information:
This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated.

ADMINISTRATIVE

CPT Codes:
- 83520

COMPLETE VIEW

Available Stat:
- No

Test Code:
- TTGTGG

Performing Lab:
- Immunology

Performed:
- Performed Friday day shift

Methodology:
- Chemiluminescent

Remarks:
- Avoid hemolysis

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Unacceptable Conditions:
- Gross Hemolyzed, lipemic or icteric samples

Specimen Preparation:
- Freeze serum at -20°C

Units:
Chemiluminescent Units (CU)

Reference Interval:
- Negative: < 20.0 CU
- Weak Positive: 20.0-30.0 CU
- Positive: > 30.0 CU

Synonyms:
- Celiac disease
- Endomysial antibody

Reported:
Printed 06/07/19
Test information subject to change
2-8 days

Additional Information:

This test may be useful in providing serologic support for a diagnosis of gluten-sensitive enteropathy (found in celiac disease and dermatitis herpetiformis). Results in the weak positive range are considered equivocal and may be repeated, if clinically indicated.

CPT Codes:

83520
Tobramycin
TOBP, TOBTH, TOBRN

ORDERING

Available Stat:
No
Performing Lab:
  Parnassus Chemistry
Performed:
  24 hours per day and 7 days per week
Methodology:
  Particle enhanced turbidimetric inhibition immunoassay (Beckman DxC 800)
Reported:
  1 day
Additional Information:
  For desired peak and trough levels in special situations, Click here
  Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L
  See the lab manual’s "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

COLLECTION

Sample Type:
  Serum or plasma
Collect:
  Gold top or Light Green top
Amount to Collect:
  1 mL blood
Preferred Volume:
  0.5 mL serum or plasma
Minimum Volume:
  0.2 mL serum or plasma
Remarks:
  Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing).
  Collect trough samples 30 minutes prior to 3rd or 4th dose.
  For patients on hemodialysis collect just prior to and/or 1 hour post dialysis.
  For standard dosing draw peak samples 30 minutes after the end of infusion. For ICN extended interval dosing draw peak 30 minutes after end of 4th dose.
  Note the exact time of collection on BOTH the sample and in Apex (or on any paper orders).
  Bring to lab immediately for processing if patient also receiving carbenicillin or other high dose penicillin or cephalosporin because prolonged interactions with these drugs (8 hours or more) at room temperature can modify amino groups and interfere with aminoglycoside assay.
Stability (from collection to initiation):
  Separated serum or plasma is stable at room temperature for 8 hours.
  Refrigerated samples are stable 48 hours.
Unacceptable Conditions:
  Collection time not indicated on sample

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code:
  TOBPK (Peak), TOBTH (Trough), TOBRN (Random)

Performing Lab:
  Parnassus Chemistry

Specimen Preparation:
  Separate serum or plasma from cells within 2 hours of collection.
  Mission Bay and Mount Zion: Refrigerate serum or plasma and send to Parnassus Chemistry

Preferred Volume:
  0.5 mL serum or plasma

Minimum Volume:
  0.2 mL serum or plasma

Unacceptable Conditions:
  Collection time not indicated on sample

Stability (from collection to initiation):
  Separated serum or plasma is stable at room temperature for 8 hours.
  Refrigerated samples are stable 48 hours.

RESULT INTERPRETATION

Units:
  mg/L

Reference Interval:
  Therapeutic peak 5-10 mg/L

Trough levels:
  Standard dosing <2 mg/L (< 1 mg/L optimum)
  Once daily, high dose <1 mg/L (< 0.3 mg/L optimum)
  ICN extended interval dosing <2 mg/L (< 1.5 mg/L optimum)
  CF extended interval dosing <1 mg/L


Additional Information:
  For desired peak and trough levels in special situations, Click here
  Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L
  See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

ADMINISTRATIVE

CPT Codes:
  80200

LOINC Codes:
  35670-9

COMPLETE VIEW

Available Stat:
  No

Test Code:
  TOBPK (Peak), TOBTH (Trough), TOBRN (Random)

Performing Lab:
  Parnassus Chemistry
Performed:
24 hours per day and 7 days per week

Methodology:
Particle enhanced turbidimetric inhibition immunoassay (Beckman DxC 800)

Remarks:
Time to Steady State: 2-3 doses (1 dose for ICN extended interval dosing).
Collect trough samples 30 minutes prior to 3rd or 4th dose.
For patients on hemodialysis collect just prior to and/or 1 hour post dialysis.
For standard dosing draw peak samples 30 minutes after the end of infusion. For ICN extended interval dosing draw peak 30 minutes after end of 4th dose.
Note the exact time of collection on BOTH the sample and in Apex (or on any paper orders).
Bring to lab immediately for processing if patient also receiving carbenicillin or other high dose penicillin or cephalosporin because prolonged interactions with these drugs (8 hours or more) at room temperature can modify amino groups and interfere with aminoglycoside assay.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Unacceptable Conditions:
Collection time not indicated on sample

Specimen Preparation:
Separate serum or plasma from cells within 2 hours of collection.
Mission Bay and Mount Zion: Refrigerate serum or plasma and send to Parnassus Chemistry

Units:
mg/L

Reference Interval:
Therapeutic peak 5-10 mg/L
Trough levels:
Standard dosing <2 mg/L (< 1 mg/L optimum)
Once daily, high dose <1 mg/L (< 0.3 mg/L optimum)
ICN extended interval dosing <2 mg/L (< 1.5 mg/L optimum)
CF extended interval dosing <1 mg/L


Stability (from collection to initiation):
Separated serum or plasma is stable at room temperature for 8 hours.
Refrigerated samples are stable 48 hours.

Reported:
1 day

Additional Information:
For desired peak and trough levels in special situations, Click here
Toxicity associated with trough levels > 2 mg/L or peak levels > 10-12 mg/L
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**CPT Codes:**
- 80200

**LOINC Codes:**
- 35670-9
Tocainide
MOLT

ORDERING

Available Stat:
No
Performing Lab:
  MDTX via Quest
Methodology:
  HPLC
Reported:
  Test run daily. Turnaround time: 3-5 days.
Synonyms:
  • Tonocard

COLLECTION

Sample Type:
  Serum
Collect:
  Red top (Gold top NOT acceptable)
Amount to Collect:
  4 mL blood
Preferred Volume:
  2 mL serum
Minimum Volume:
  0.5 mL serum
Unacceptable Conditions:
  Sample collected in Gold top

PROCESSING

Test Code:
  MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)
Sendout:
  Yes
Performing Lab:
  MDTX via Quest
Specimen Preparation:
  Refrigerate. Order Quest # 11787
Preferred Volume:
  2 mL serum
Minimum Volume:
  0.5 mL serum
Unacceptable Conditions:
  Sample collected in Gold top

RESULT INTERPRETATION

Units:
  mg/L
Reference Interval:
Therapeutic: 4-10 mg/L
Potentially toxic: > 10 mg/L

**ADMINISTRATIVE**

CPT Codes:
80299-90

**COMPLETE VIEW**

Available Stat:
No

Test Code:
MOLT (Order in Apex as 'Miscellaneous Outside Lab Test' using the complete test name above)

Performing Lab:
MDTX via Quest

Sendout:
Yes

Methodology:
HPLC

Collect:
Red top (Gold top NOT acceptable)

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Sample collected in Gold top

Specimen Preparation:
Refrigerate. Order Quest # 11787

Units:
mg/L

Reference Interval:
Therapeutic: 4-10 mg/L
Potentially toxic: > 10 mg/L

Synonyms:
- Tonocard

Reported:
Test run daily. Turnaround time: 3-5 days.

CPT Codes:
80299-90
Tocopherols

VITE

ORDERING

Available Stat:
No

Performing Lab:
Quest

Methodology:
HPLC

Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:
To convert mg/L to µmol/L (SI units) multiply by 2.32.

This assay measures alpha- (the main source of activity) and combined beta- and gamma-tocopherols. The bioavailability of Vitamin E may be impaired in hyperlipidemic states, in which it may be useful to simultaneously measure Cholesterol, Total or Lipids, Total. The Vitamin E/lipid ratios calculated as (100 x Vitamin E [in mg/L])/(lipid [in mg/dL]) are normally > 3 mg/g for E/cholesterol or > 1 mg/g for E/total lipids.

Synonyms:
- Vitamin E
- Alpha Tocopherol

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred.

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
4 mL blood

Preferred Volume:
2 mL serum

Minimum Volume:
0.6 mL serum

Remarks:
Wrap collection tube in aluminum foil to protect from light.

PROCESSING

Test Code:
VITE

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
Freeze serum at -20C in dark pour-off vial. Order Quest # 5009N

Preferred Volume:
2 mL serum

Minimum Volume:
RESULT INTERPRETATION

Units:
mg/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>alpha-tocopherol</th>
</tr>
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<tbody>
<tr>
<td>Cord blood at term</td>
<td>1.8-5.8 mg/L</td>
</tr>
<tr>
<td>4-11 months</td>
<td>&lt;9.1 mg/L</td>
</tr>
<tr>
<td>1-2 years</td>
<td>2.9-16.6 mg/L</td>
</tr>
<tr>
<td>3-5 years</td>
<td>5.5-11.8 mg/L</td>
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<tr>
<td>6-8 years</td>
<td>4.6-14.8 mg/L</td>
</tr>
<tr>
<td>9-11 years</td>
<td>6.2-14.3 mg/L</td>
</tr>
<tr>
<td>12-17 years</td>
<td>3.7-12.4 mg/L</td>
</tr>
<tr>
<td>&gt;17 years</td>
<td>5.7-19.9 mg/L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>beta/gamma tocopherols</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-17 years</td>
<td>0.5-3.8 mg/L</td>
</tr>
<tr>
<td>&gt;17 years</td>
<td>&lt;4.4 mg/L</td>
</tr>
</tbody>
</table>

Additional Information:
To convert mg/L to µmol/L (SI units) multiply by 2.32.

This assay measures alpha- (the main source of activity) and combined beta- and gamma-tocopherols. The bioavailability of Vitamin E may be impaired in hyperlipidemic states, in which it may be useful to simultaneously measure Cholesterol, Total or Lipids, Total. The Vitamin E/lipid ratios calculated as (100 x Vitamin E [in mg/L] / lipid [in mg/dL]) are normally > 3 mg/g for E/cholesterol or > 1 mg/g for E/total lipids.

ADMINISTRATIVE

CPT Codes:
84446-90

LOINC Codes:
1823-4

COMPLETE VIEW

Available Stat:
No

Test Code:
VITE

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
An 8 hour fast before specimen collection is preferred.

Remarks:
Wrap collection tube in aluminum foil to protect from light.

Collect:
Gold top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.6 mL serum

Specimen Preparation:
Freeze serum at -20°C in dark pour-off vial. Order Quest # 5009N

Units:
mg/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>alpha-tocopherol</th>
<th>beta/gamma tocopherols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cord blood at term</td>
<td>1.8-5.8 mg/L</td>
<td>0.5-3.8 mg/L</td>
</tr>
<tr>
<td>4-11 months</td>
<td>&lt;9.1 mg/L</td>
<td>5.7-19.9 mg/L</td>
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<tr>
<td>1-2 years</td>
<td>2.9-16.6 mg/L</td>
<td>&gt;17 years &lt;4.4 mg/L</td>
</tr>
<tr>
<td>3-5 years</td>
<td>5.5-11.8 mg/L</td>
<td>0.5-3.8 mg/L</td>
</tr>
<tr>
<td>6-8 years</td>
<td>4.6-14.8 mg/L</td>
<td>&gt;17 years &lt;4.4 mg/L</td>
</tr>
<tr>
<td>9-11 years</td>
<td>6.2-14.3 mg/L</td>
<td>4.6-14.8 mg/L</td>
</tr>
<tr>
<td>12-17 years</td>
<td>3.7-12.4 mg/L</td>
<td>3.7-12.4 mg/L</td>
</tr>
<tr>
<td>&gt;17 years</td>
<td>5.7-19.9 mg/L</td>
<td>5.7-19.9 mg/L</td>
</tr>
</tbody>
</table>

Synonyms:
- Vitamin E
- Alpha Tocopherol

Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:
To convert mg/L to µmol/L (SI units) multiply by 2.32.

This assay measures alpha- (the main source of activity) and combined beta- and gamma-tocopherols. The bioavailability of Vitamin E may be impaired in hyperlipidemic states, in which it may be useful to simultaneously measure Cholesterol, Total or Lipids, Total. The Vitamin E/lipid ratios calculated as (100 x Vitamin E [in mg/L])/(lipid [in mg/dL]) are normally > 3 mg/g for E/cholesterol or > 1 mg/g for E/total lipids.

CPT Codes:
84446-90

LOINC Codes:
1823-4
Toll-Like Receptor Function

ORDERING

Ordering Recommendations:
Assist in diagnosis of innate immunodeficiencies when genetic defects of the innate immune system are suspected in individuals negative for other immunodeficiencies (eg, no detectable abnormality of antibody function, complement activity, neutrophil function, or cell-mediated immunity).

Performed:
Tue-Fri

Methodology:
Cell Culture/Quantitative Multiplex Bead Assay

Reported:
9-10 days

Synonyms:
• TLR Function

COLLECTION

Patient Preparation:
Collect control specimen from a healthy individual unrelated to patient at approximately the same time as and under similar conditions to the patient.

Sample Type:
Whole blood

Collect:
Green (sodium heparin) (patient) AND green (sodium heparin) (control). Also acceptable: Yellow (ACD solution A) (patient) AND yellow (ACD solution A) (control). Patient and control specimens must be collected within 48 hours of test performance.

Amount to Collect:
10 mL (patient) and 10 mL (control)

Preferred Volume:
10 mL (patient) and 10 mL (control)

Minimum Volume:
7 mL (patient) and 7 mL (control)

Infants: 3 mL (patient) and 7 mL (control)

Stability (from collection to initiation):
Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

New York State Clients: Ambient 24 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

Storage/Transport Temperature:
CRITICAL ROOM TEMPERATURE.

Unacceptable Conditions:
Yellow (ACD Solution B). Refrigerated or frozen specimens.

PROCESSING

Test Code:
TLR

ARUP Test Code:
0051589

Sendout:
Yes

Specimen Preparation:
Transport 10 mL whole blood (patient) AND 10 mL whole blood (control) in original collection tubes. (Min: 7 mL (patient) AND 7 mL (control)) Do not refrigerate or freeze. LIVE CELLS REQUIRED.
Infant Minimum: 3 mL whole blood (patient) AND 7 mL whole blood (control).

**Preferred Volume:**
- 10 mL (patient) and 10 mL (control)

**Minimum Volume:**
- 7 mL (patient) and 7 mL (control)

Infants: 3 mL (patient) and 7 mL (control)

**Unacceptable Conditions:**
- Yellow (ACD Solution B). Refrigerated or frozen specimens.

**Stability (from collection to initiation):**
- Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable
- New York State Clients: Ambient 24 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

**Storage/Transport Temperature:**
- CRITICAL ROOM TEMPERATURE.

**RESULT INTERPRETATION**

**Reference Interval:**
- By report

**Interpretive Data:**
Toll-like receptors (TLR) are tested independently by stimulation with TLR-specific ligands in a peripheral blood mononuclear cell (PBMC) culture. PBMC production of IL-1 beta, IL-6, and TNF alpha is determined by multiplex bead assay for TLR1-8. In addition, PBMC production of CXCL10 is determined for TLR3.

TLR-specific ligands include Pam3CSK4, a synthetic bacterial lipoprotein (TLR2-TLR1 ligand); zymosan cell wall particles from Saccharomyces cerevisiae (TLR6-TLR2 ligand); poly (I:C), a synthetic analog of dsRNA (TLR3 ligand); lipopolysaccharide (LPS) ultra-pure S. minnesota LPS (TLR4 ligand); flagellin purified from S. typhimurium (TLR5 ligand); and CL097 imidazoquinoline compound (TLR7-TLR8 ligand).

**ADMINISTRATIVE**

**CPT Codes:**
- 86353 x6; 83520 x3

**COMPLETE VIEW**

**Ordering Recommendations:**
- Assist in diagnosis of innate immunodeficiencies when genetic defects of the innate immune system are suspected in individuals negative for other immunodeficiencies (eg, no detectable abnormality of antibody function, complement activity, neutrophil function, or cell-mediated immunity).

**Test Code:**
- TLR

**ARUP Test Code:**
- 0051589

**Sendout:**
- Yes

**Performed:**
- Tue-Fri

**Methodology:**
- Cell Culture/Quantitative Multiplex Bead Assay

**Patient Preparation:**
- Collect control specimen from a healthy individual unrelated to patient at approximately the same time as and under similar conditions to the patient.

**Collect:**
- Green (sodium heparin) (patient) AND green (sodium heparin) (control). Also acceptable: Yellow (ACD solution A) (patient) AND yellow (ACD solution A) (control). Patient and control specimens must be collected within 48 hours of test performance.

Test information subject to change.
**Amount to Collect:**

10 mL (patient) and 10 mL (control)

**Sample Type:**

Whole blood

**Preferred Volume:**

10 mL (patient) and 10 mL (control)

**Minimum Volume:**

7 mL (patient) and 7 mL (control)

Infants: 3 mL (patient) and 7 mL (control)

**Unacceptable Conditions:**

Yellow (ACD Solution B). Refrigerated or frozen specimens.

**Specimen Preparation:**

Transport 10 mL whole blood (patient) AND 10 mL whole blood (control) in original collection tubes. (Min: 7 mL (patient) AND 7 mL (control)) Do not refrigerate or freeze. LIVE CELLS REQUIRED.

Infant Minimum: 3 mL whole blood (patient) AND 7 mL whole blood (control).

**Reference Interval:**

By report

**Interpretive Data:**

Toll-like receptors (TLR) are tested independently by stimulation with TLR-specific ligands in a peripheral blood mononuclear cell (PBMC) culture. PBMC production of IL-1 beta, IL-6, and TNF alpha is determined by multiplex bead assay for TLR1-8. In addition, PBMC production of CXCL10 is determined for TLR3.

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**Synonyms:**

- TLR Function

**Storage/Transport Temperature:**

CRITICAL ROOM TEMPERATURE.

**Stability (from collection to initiation):**

Ambient: 48 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

New York State Clients: Ambient 24 hours; Refrigerated: Unacceptable; Frozen: Unacceptable

**Reported:**

9-10 days

**CPT Codes:**

86353 x6; 83520 x3

**Notes:**

Results for TNF alpha, IL-1 beta, IL-6, and CXCL10 are reported as pg/mL. Interpretation comparing the patient results to the simultaneously collected client normal control and the laboratory normal control will be provided by an ARUP medical director.

Limitation: Defects in TLR3 associated with Herpes Simplex Encephalitis may not be detected in this assay based on the reported instance of a patient with compound heterozygous mutations in TLR3 leading to decreased cytokine production in response to Poly I:C in fibroblasts but not PBMCs. Proteins IRAK-4 and MyD88 play essential roles in TLR-mediated signaling. Defects in IRAK-4 and MyD88 result in compromised TLR signaling. Exceptions are , TLR3 and endosomal TLR4, which, are IRAK-4 and MyD88 independent.

Topiramate
TOPA

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Fluorescent polarization immunoassay
Reported:
Performed 5x per week. Turnaround 4-8 days
Additional Information:
Topiramate is an antidepressant used as an adjunctive treatment of partial epilepsy and Lennox-Gastaut syndrome in children. Monitoring is useful to optimize dose and avoid toxicity.
Synonyms:
• Topamax

COLLECTION

Sample Type:
Serum (plasma acceptable)
Collect:
Red top preferred, Dark green top acceptable (Gold top NOT acceptable)
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Remarks:
Draw peak 2-4 hours after dose, trough 0.5-1 hour before dose when patient is at steady state. Avoid hemolysis
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month
Unacceptable Conditions:
Drawn in Gold top or Light green top vacutainer. Hemolysis, Lipemia

PROCESSING

Test Code:
TOPA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Maintain sample at room temperature. Order Quest # 30965
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Unacceptable Conditions:
Drawn in Gold top or Light green top vacutainer. Hemolysis, Lipemia
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 month

RESULT INTERPRETATION

Units:
µg/mL (mcg/mL)

Reference Interval:

<table>
<thead>
<tr>
<th>Daily dose (mg)</th>
<th>Peak (µg/mL)</th>
<th>Trough (µg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>6.5-9.2</td>
<td>4.5-6.6</td>
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<tr>
<td>200</td>
<td>12-16</td>
<td>8-12</td>
</tr>
<tr>
<td>400</td>
<td>20-30</td>
<td>14-20</td>
</tr>
</tbody>
</table>

Additional Information:
Topiramate is an antidepressant used as an adjunctive treatment of partial epilepsy and Lennox-Gastaut syndrome in children. Monitoring is useful to optimize dose and avoid toxicity.

ADMINISTRATIVE

CPT Codes:
80201-90

LOINC Codes:
17713-9

COMPLETE VIEW

Available Stat:
No

Test Code:
TOPA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Flourescent polarization immunoassay

Remarks:
Draw peak 2-4 hours after dose, trough 0.5-1 hour before dose when patient is at steady state. Avoid hemolysis

Collect:
Red top preferred, Dark green top acceptable (Gold top NOT acceptable)

Amount to Collect:
2 mL blood

Sample Type:
Serum (plasma acceptable)

Preferred Volume:
1 mL serum or plasma

Minimum Volume:
0.5 mL serum or plasma

Unacceptable Conditions:
Drawn in Gold top or Light green top vacutainer. Hemolysis, Lipemia

Specimen Preparation:
Maintain sample at room temperature. Order Quest # 30965

Units:
µg/mL (mcg/mL)

Reference Interval:
### Synonyms:
- Topamax

### Stability (from collection to initiation):
- Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 1 month

### Reported:
- Performed 5x per week. Turnaround 4-8 days

### Additional Information:
- Topiramate is an antidepressant used as an adjunctive treatment of partial epilepsy and Lennox-Gastaut syndrome in children. Monitoring is useful to optimize dose and avoid toxicity.

### CPT Codes:
- 80201-90

### LOINC Codes:
- 17713-9
Total Tryptase
TTRP

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Fluoroenzyme Immunoassay
Additional Information:
Tryptase concentrations are increased with immediate hypersensitivity (anaphylaxis), acute allergen challenge, and mastocytosis. When it is necessary to distinguish mature tryptase from total tryptase, an order for a miscellaneous outside lab test (MOLT) can be sent requesting an assay for a tryptase level from the clinical laboratory at Virginia Commonwealth University which reports out both mature tryptase and total tryptase in their assay.

phone (804) 828-9685.

COLLECTION

Sample Type:
Serum
Collect:
Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen 1 month.

PROCESSING

Test Code:
TTRP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot serum and freeze. Ship frozen to China Basin.
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen 1 month.

RESULT INTERPRETATION
Units:
ng/mL
Reference Interval:
2-10 ng/mL
Additional Information:
Tryptase concentrations are increased with immediate hypersensitivity (anaphylaxis), acute allergen challenge, and mastocytosis.

When it is necessary to distinguish mature tryptase from total tryptase, an order for a miscellaneous outside lab test (MOLT) can be sent requesting an assay for a tryptase level from the clinical laboratory at Virginia Commonwealth University which reports out both mature tryptase and total tryptase in their assay.

phone (804) 828-9685.

ADMINISTRATIVE

CPT Codes:
83520-90

COMPLETE VIEW

Available Stat:
No
Test Code:
TTRP
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Fluoroenzyme Immunoassay
Collect:
Red top
Amount to Collect:
2 mL blood
Sample Type:
Serum
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Specimen Preparation:
Aliquot serum and freeze. Ship frozen to China Basin.
Units:
ng/mL
Reference Interval:
2-10 ng/mL
Stability (from collection to initiation):
Room temperature 2 days, refrigerated 5 days, frozen 1 month.
Additional Information:
Tryptase concentrations are increased with immediate hypersensitivity (anaphylaxis), acute allergen challenge, and mastocytosis.

When it is necessary to distinguish mature tryptase from total tryptase, an order for a miscellaneous outside lab test (MOLT) can be sent requesting an assay for a tryptase level from the clinical laboratory at Virginia Commonwealth University which reports out both mature tryptase and total tryptase in their assay.

phone (804) 828-9685.

CPT Codes:
83520-90
Toxocara species Antibody

**ORDERING**

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
ELISA
Reported:
3-4 weeks.
Additional Information:
75% of acute cases are identified using a titer of >= 32, which is found in 10% of normal individuals, probably due to subclinical infection. If titers < 32 are considered significant, the number of false-positive diagnoses increases.
Synonyms:
- Visceral larva migrans

**COLLECTION**

Sample Type:
Serum, Vitreous
Collect:
Red top or Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum or vitreous
Minimum Volume:
0.1 mL serum or 0.25 mL vitreous

**PROCESSING**

Test Code:
TOXOC (MOLT for vitreous samples)
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Serum: Send serum sample refrigerated to Quest, Order Quest # 53868P.
Vitreous: Send refrigerated fluid to Focus. Order test code 60945.
Preferred Volume:
1 mL serum or vitreous
Minimum Volume:
0.1 mL serum or 0.25 mL vitreous

**RESULT INTERPRETATION**

Reference Interval:
Additional Information:

75% of acute cases are identified using a titer of >= 32, which is found in 10% of normal individuals, probably due to subclinical infection. If titers < 32 are considered significant, the number of false-positive diagnoses increases.

CPT Codes:

86682-90
**Toxoplasma gondii Antibody, IgG**

**TOXO**

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Immunology

**Performed:**
- Monday-Friday (day shift)

**Methodology:**
- Chemiluminescent Immunoassay

**Reported:**
- 1-4 days

**Synonyms:**
- TORCH Antibodies

**COLLECTION**

**Sample Type:**
- Serum

**Collect:**
- Gold top

**Amount to Collect:**
- 2 mL blood

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Remarks:**
- Avoid Hemolysis

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric samples

**PROCESSING**

**Test Code:**
- TOXO

**Test Group:**
- Toxoplasma

**Performing Lab:**
- Immunology

**Specimen Preparation:**
- Freeze at -20C

**Preferred Volume:**
- 1 mL serum

**Minimum Volume:**
- 0.5 mL serum

**Unacceptable Conditions:**
- Grossly hemolyzed, lipemic or icteric samples

**RESULT INTERPRETATION**

Printed 06/07/19
Test information subject to change
Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
86777

LOINC Codes:
40677-7

COMPLETE VIEW

Available Stat:
No

Test Code:
TOXO

Test Group:
Toxoplasma

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Remarks:
Avoid Hemolysis

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

Specimen Preparation:
Freeze at -20C

Reference Interval:
Negative

Synonyms:
- TORCH Antibodies

Reported:
1-4 days

CPT Codes:
86777

LOINC Codes:
40677-7
Toxoplasma gondii Antibody, IgG & IgM
TOGM

ORDERING

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Chemiluminescent Immunoassay
Reported:
1-4 days
Additional Information:
The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed.

IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

Synonyms:
- TORCH Antibodies

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Remarks:
Avoid hemolysis
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code:
TOGM
Performing Lab:
Immunology
Specimen Preparation:
Freeze at -20C
Preferred Volume:
1 mL serum
Minimum Volume:
RESULT INTERPRETATION

Reference Interval:
- Toxoplasma IgM: Negative
- Toxoplasma IgG: Negative

Additional Information:
The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed.

IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

ADMINISTRATIVE

CPT Codes:
- 86778, 86777

LOINC Codes:
- 40678-5; 40677-7

COMPLETE VIEW

Available Stat:
- No

Test Code:
- TOGM

Performing Lab:
- Immunology

Performed:
- Monday-Friday (day shift)

Methodology:
- Chemiluminescent Immunoassay

Remarks:
- Avoid hemolysis

Collect:
- Gold top

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Unacceptable Conditions:
- Grossly hemolyzed, lipemic or icteric samples

Specimen Preparation:
- Freeze at -20°C

Reference Interval:
- Toxoplasma IgM: Negative
Toxoplasma IgG: Negative

Synonyms:
- TORCH Antibodies

Reported:
1-4 days

Additional Information:
The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed.

IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

CPT Codes:
86778, 86777

LOINC Codes:
40678-5; 40677-7
Toxoplasma gondii Antibody, IgG, CSF
TXCG

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code:
TXCG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest test # 10666X
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF

RESULT INTERPRETATION

Reference Interval:
Negative: < 0.90
Equivocal: 0.9-1.09
Positive: >= 1.10

ADMINISTRATIVE

CPT Codes:
Available Stat:

No

Test Code:

TXCG

Performing Lab:

Quest

Sendout:

Yes

Methodology:

EIA

Remarks:

Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:

CSF tube or sterile collection tube

Amount to Collect:

See preferred volume

Sample Type:

CSF

Preferred Volume:

1 mL CSF

Minimum Volume:

0.1 mL CSF

Specimen Preparation:

Refrigerate. Order Quest test # 10666X

Reference Interval:

Negative: < 0.90
Equivocal: 0.9-1.09
Positive: >= 1.10

Reported:

Test run Monday-Friday. Turnaround time: 2-4 days.

CPT Codes:

86777-90

LOINC Codes:

30568-0
Toxoplasma gondii Antibody, IgM, CSF
TXCM and TXCG

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
EIA
Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.
Additional Information:
This test is always run in conjunction with a test for IgG Antibody.

The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed. IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

COLLECTION

Sample Type:
CSF
Collect:
CSF tube or sterile collection tube
Amount to Collect:
See preferred volume
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF
Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

PROCESSING

Test Code:
TXCM and TXCG
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate. Order Quest test # 10485X
Preferred Volume:
1 mL CSF
Minimum Volume:
0.1 mL CSF

RESULT INTERPRETATION
Reference Interval:
- Negative: < 0.90
- Equivocal: 0.9-1.09
- Positive: >= 1.10

Additional Information:
This test is always run in conjunction with a test for IgG Antibody.

The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed. IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

ADMINISTRATIVE

CPT Codes:
- 86778-90, 86777-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- TXCM and TXCG

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- EIA

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
- CSF tube or sterile collection tube

Amount to Collect:
- See preferred volume

Sample Type:
- CSF

Preferred Volume:
- 1 mL CSF

Minimum Volume:
- 0.1 mL CSF

Specimen Preparation:
- Refrigerate. Order Quest test # 10485X

Reference Interval:
- Negative: < 0.90
- Equivocal: 0.9-1.09
- Positive: >= 1.10

Reported:
- Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:
- This test is always run in conjunction with a test for IgG Antibody.

The FDA recommends that IgM assays only be performed in conjunction with an IgG Antibody test. Equivocal results may be clarified by
repeating the test after an additional week or more has passed. Because IgM antibody may persist for more than a year after acute infection, IgM assay is most reliable in excluding recent primary infection, except in the earliest stages or in rare neonates who do not have an early IgM response, in whom additional testing may be needed. IgM is not usually elevated in disease due to reactivation of latent infection, such as chronic chorioretinitis or encephalitis in immunosuppressed patients with AIDS or lymphoma. The diagnosis of acute or recent Toxoplasma gondii infection should not be based on one IgM serology result. It is suggested that a positive result be confirmed by an alternate method.

**CPT Codes:**
86778-90, 86777-90
Toxoplasma gondii stain
P403

ORDERING

Available Stat: No
Performing Lab: Microbiology
Performed: Monday-Friday, day shift
Methodology: Giemsa stain
Reported: 1-3 days

COLLECTION

Sample Type: Sputum
Collect: Clean container
Remarks: Only submit sputum to the clinical laboratory. Send other specimens for detecting the organism to Pathology.

Friday samples must be received by 1230 hours.

Stability (from collection to initiation): Refrigerated 24 hours

PROCESSING

Test Code: P403
Test Group: Toxoplasma
Performing Lab: Microbiology
Stability (from collection to initiation): Refrigerated 24 hours

ADMINISTRATIVE

CPT Codes: 87207

COMPLETE VIEW

Available Stat: No
Test Code: P403
Test Group: Toxoplasma
Performing Lab:
Microbiology

**Performed:**
- Monday-Friday, day shift

**Methodology:**
- Giemsa stain

**Remarks:**
- Only submit sputum to the clinical laboratory. Send other specimens for detecting the organism to Pathology.
- Friday samples must be received by 1230 hours.

**Collect:**
- Clean container

**Sample Type:**
- Sputum

**Stability (from collection to initiation):**
- Refrigerated 24 hours

**Reported:**
- 1-3 days

**CPT Codes:**
- 87207
Toxoplasma gondii, DNA
TXPCR

ORDERING

Available Stat:
No
Performing Lab:
Viracor
Methodology:
Real time PCR
Additional Information:
Assay range: 100-1.0x10^8 copies/mL

COLLECTION

Sample Type:
EDTA whole blood, CSF, Amniotic fluid, BAL, Unfixed tissue
Collect:
Lavender top, CSF tube or sterile collection tube
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood or fluid
Minimum Volume:
2 mL blood or fluid
Remarks:
Tissue specimens should be placed in saline to keep moist during processing and shipping.
Unacceptable Conditions:
Improperly submitted samples

PROCESSING

Test Code:
TXPCR
Test Group:
Toxoplasma
Sendout:
Yes
Performing Lab:
Viracor
Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection.
CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.
Preferred Volume:
3 mL blood or fluid
Minimum Volume:
2 mL blood or fluid
Unacceptable Conditions:
Improperly submitted samples

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
copies/mL

Reference Interval:
Not detected

Additional Information:
Assay range: 100-1.0\times 10^8 \text{ copies/mL}

ADMINISTRATIVE

CPT Codes:
87799-90

LOINC Codes:
49448-4

COMPLETE VIEW

Available Stat:
No

Test Code:
TXPCR

Test Group:
Toxoplasma

Performing Lab:
Viracor

Sendout:
Yes

Methodology:
Real time PCR

Remarks:
Tissue specimens should be placed in saline to keep moist during processing and shipping.

Collect:
Lavender top, CSF tube or sterile collection tube

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood, CSF, Amniotic fluid, BAL, Unfixed tissue

Preferred Volume:
3 mL blood or fluid

Minimum Volume:
2 mL blood or fluid

Unacceptable Conditions:
Improperly submitted samples

Specimen Preparation:
Keep non-CSF samples at room temperature and ship at room temperature. Samples should be received at Viracor within 96 hours of collection.

CSF must be frozen transported to China Basin and then shipped on dry ice to ViraCor.

Units:
copies/mL

Reference Interval:
Not detected

Additional Information:
Assay range: 100-1.0\times 10^8 \text{ copies/mL}
CPT Codes:
   87799-90
LOINC Codes:
   49448-4
Transferrin, beta-2-
B2TAU

ORDERING

Available Stat:
No
Performing Lab:
Mayo
Methodology:
Electrophoresis, Immunofixation-peroxidase antisera/Dimethylformamide visualization
Reported:
Performed 6 days per week. Turnaround 3-5 days
Additional Information:
This asialyl variant of transferrin is normally found in CSF but not serum or nasal secretions. Its presence in otic or nasal fluid discharge suggests a leakage of CSF.

False positives may occur due to contamination with aqueous humor, the serum of patients following ingestion of alcohol, and the serum of some normal individuals with a structural variant which displays a similar electrophoretic mobility.

Synonyms:
• Tau-protein
• CSF leak
• Transferrin, B2
• B2 transferrin
• cerebrospinal fluid leakage
• Otorrhea, CSF
• Rhinorrhea, CSF

COLLECTION

Sample Type:
Nasal or Otic Fluid discharge.

NOTE: This test should NOT be performed on known CSF samples without approval from a Lab Medicine faculty or resident.
Collect:
Small collection tube or cotton swab
Amount to Collect:
See preferred volume
Preferred Volume:
0.5 mL fluid
Minimum Volume:
0.05 mL (50 µL) fluid
Remarks:
Collect 0.5 mL of body fluid (nasal, otic, etc.) directly with a pipet, syringe, test tube or microcollection device. If submitting a syringe, remove needle and add cap to end of syringe. If direct collection is not feasible, specimen may be collected using cotton swabs:

A. Place cotton swab in as small a container as possible.

B. Do NOT add any additional fluid to swab including, but not limited to, saline or microcollection fluids.

C. Tightly seal container and freeze.

D. Indicate specimen type on request form.

E. Send specimen frozen in plastic vial.
Stability (from collection to initiation):
    Room temperature unacceptable, refrigerated unacceptable, frozen at -20C, 2 weeks.

Unacceptable Conditions:
    Samples that are not collected per "Collection Instructions" Syringes received with needle attached.

PROCESSING

Test Code:
    B2TAU
Test Group:
    Transferrin
Sendout:
    Yes
Performing Lab:
    Mayo
Specimen Preparation:
    Freeze fluid or swab at -20C. Ship frozen. Order Mayo test # 80351.
Preferred Volume:
    0.5 mL fluid
Minimum Volume:
    0.05 mL (50 µL) fluid
Unacceptable Conditions:
    Samples that are not collected per "Collection Instructions" Syringes received with needle attached.
Stability (from collection to initiation):
    Room temperature unacceptable, refrigerated unacceptable, frozen at -20C, 2 weeks.

RESULT INTERPRETATION

Reference Interval:
    Negative
Additional Information:
    This asialyl variant of transferrin is normally found in CSF but not serum or nasal secretions. Its presence in otic or nasal fluid discharge suggests a leakage of CSF.
    
    False positives may occur due to contamination with aqueous humor, the serum of patients following ingestion of alcohol, and the serum of some normal individuals with a structural variant which displays a similar electrophoretic mobility.

ADMINISTRATIVE

CPT Codes:
    86335-90
LOINC Codes:
    13876-8

COMPLETE VIEW

Available Stat:
    No
Test Code:
    B2TAU
Test Group:
    Transferrin
Performing Lab:
    Mayo
Sendout:
Methodology:
Electrophoresis, Immunofixation-peroxidase antisera/Dimethylformamide visualization

Remarks:
Collect 0.5 mL of body fluid (nasal, otic, etc.) directly with a pipet, syringe, test tube or microcollection device. If submitting a syringe, remove needle and add cap to end of syringe. If direct collection is not feasible, specimen may be collected using cotton swabs:

A. Place cotton swab in as small a container as possible.
B. Do NOT add any additional fluid to swab including, but not limited to, saline or microcollection fluids.
C. Tightly seal container and freeze.
D. Indicate specimen type on request form.
E. Send specimen frozen in plastic vial.

Collect:
Small collection tube or cotton swab

Amount to Collect:
See preferred volume

Sample Type:
Nasal or Otic Fluid discharge.

NOTE: This test should NOT be performed on known CSF samples without approval from a Lab Medicine faculty or resident.

Preferred Volume:
0.5 mL fluid

Minimum Volume:
0.05 mL (50 µL) fluid

Unacceptable Conditions:
Samples that are not collected per "Collection Instructions" Syringes received with needle attached.

Specimen Preparation:
Freeze fluid or swab at -20C. Ship frozen. Order Mayo test # 80351.

Reference Interval:
Negative

Synonyms:
• Tau-protein
• CSF leak
• Transferrin, B2
• B2 transferrin
• cerebrospinal fluid leakage
• Otorrhea, CSF
• Rhinorrhea, CSF

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C, 2 weeks.

Reported:
Performed 6 days per week. Turnaround 3-5 days

Additional Information:
This asialyl variant of transferrin is normally found in CSF but not serum or nasal secretions. Its presence in otic or nasal fluid discharge suggests a leakage of CSF.

False positives may occur due to contamination with aqueous humor, the serum of patients following ingestion of alcohol, and the serum of some normal individuals with a structural variant which displays a similar electrophoretic mobility.

CPT Codes:
86335-90

LOINC Codes:
13876-8
Transferrin, Serum / Plasma
TRFN

**ORDERING**

Available Stat:
No
Performing Lab:
Immunology
Performed:
Monday-Friday (day shift)
Methodology:
Rate nephelometry
Reported:
1-3 days
Additional Information:
May be used to follow nutritional status, however, interpret results with caution, as transferrin is also an acute-phase reactant. See also entry for Iron, Transferrin and Transferrin Saturation.

**Synonyms:**
- Transferrin beta-1-
- beta-1-Transferrin
- Iron

**COLLECTION**

Sample Type:
Serum or plasma
Collect:
Gold top preferred, Light green top acceptable
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Stability (from collection to initiation):
Refrigerated 4 days

**PROCESSING**

Test Code:
TRFN
Test Group:
Transferrin
Performing Lab:
Immunology
Specimen Preparation:
Refrigerate sample
Preferred Volume:
0.5 mL serum or plasma
Minimum Volume:
0.3 mL serum or plasma
Stability (from collection to initiation):
RESULT INTERPRETATION

Units:

mg/dL

Reference Interval:

182-360 mg/dL

Additional Information:

May be used to follow nutritional status, however, interpret results with caution, as transferrin is also an acute-phase reactant. See also entry for Iron, Transferrin and Transferrin Saturation.

ADMINISTRATIVE

CPT Codes:

84466

COMPLETE VIEW

Available Stat:

No

Test Code:

TRFN

Test Group:

Transferrin

Performing Lab:

Immunology

Performed:

Monday-Friday (day shift)

Methodology:

Rate nephelometry

Collect:

Gold top preferred, Light green top acceptable

Amount to Collect:

1 mL blood

Sample Type:

Serum or plasma

Preferred Volume:

0.5 mL serum or plasma

Minimum Volume:

0.3 mL serum or plasma

Specimen Preparation:

Refrigerate sample

Units:

mg/dL

Reference Interval:

182-360 mg/dL

Synonyms:

• Transferrin beta-1- 
  • beta-1-Transferrin 
  • Iron

Stability (from collection to initiation):

Refrigerated 4 days

Reported:
1-3 days

Additional Information:
May be used to follow nutritional status, however, interpret results with caution, as transferrin is also an acute-phase reactant. See also entry for Iron, Transferrin and Transferrin Saturation.

CPT Codes:
84466
**Translocation 11 / 14 FISH**  
TR1114, BT1114

**ORDERING**

**Available Stat:**
- No

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily Monday - Friday

**Methodology:**
- Fluorescent In-situ hybridization (FISH)

**Reported:**
- 1-2 weeks

**Synonyms:**
- IGH/CCND1 Translocation
- T1114
- T11:14
- TR1114
- BT1114

**COLLECTION**

**Sample Type:**
- Heparinized whole blood or bone marrow. Bone marrow biopsy

**Collect:**
- Dark green top (Sodium heparin)

**Amount to Collect:**
- See preferred volume.

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Remarks:**
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

**Stability (from collection to initiation):**
- Room temperature 2 days

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

**PROCESSING**

**Test Code:**
- BT1114: Blood
- TR1114: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Specimen Preparation:**
Keep at room temperature, do not centrifuge

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

**Stability (from collection to initiation):**
- Room temperature 2 days

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**RESULT INTERPRETATION**

**Reference Interval:**
- Absent

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**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes

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**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BT1114: Blood
- TR1114: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily Monday - Friday

**Methodology:**
- Fluorescent In-situ hybridization (FISH)

**Remarks:**
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

**Collect:**
- Dark green top (Sodium heparin)

**Amount to Collect:**
- See preferred volume.

**Sample Type:**
- Heparinized whole blood or bone marrow. Bone marrow biopsy

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
Frozen, leaking or unlabeled samples

**Specimen Preparation:**
Keep at room temperature, do not centrifuge

**Reference Interval:**
Absent

**Synonyms:**
- IGH/CCND1 Translocation
- T11:14
- T11:14
- TR1114
- BT1114

**Stability (from collection to initiation):**
Room temperature 2 days

**Reported:**
1-2 weeks

**CPT Codes:**
88271 x2, 88275

**LDT or Modified FDA:**
Yes
Translocation 12/21 FISH
BT1221, TR1221

ORDERING

Available Stat:
No

Performing Lab:
Molecular Genetics - Cytogenetics

Performed:
Monday - Friday 0900-1700

Methodology:
FISH

Reported:
1-2 weeks

Synonyms:
- TEL/AML1 translocation FISH, ETV6/RUNX1 translocation FISH

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow, Bone marrow core biopsy

Collect:
Dark green top

Amount to Collect:
See preferred volume.

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Remarks:
Mix sample well with anticoagulant. keep at room temperature

Stability (from collection to initiation):
Room temperature 2 days

Unacceptable Conditions:
Clotted samples. Samples received refrigerated or frozen.

PROCESSING

Test Code:
BT1221: Blood
TR1221: Bone marrow

Performing Lab:
Molecular Genetics - Cytogenetics

Specimen Preparation:
Do not centrifuge, refrigerate or freeze samples.

Transport to China Basin Cytogenetics asap.

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Stability (from collection to initiation):
- Room temperature 2 days

ADMINISTRATIVE

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BT1221: Blood
- TR1221: Bone marrow

Performing Lab:
- Molecular Genetics - Cytogenetics

Performed:
- Monday - Friday 0900-1700

Methodology:
- FISH

Remarks:
- Mix sample well with anticoagulant. keep at room temperature

Collect:
- Dark green top

Amount to Collect:
- See preferred volume.

Sample Type:
- Heparinized whole blood or bone marrow, Bone marrow core biopsy

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Clotted samples. Samples received refrigerated or frozen.

Specimen Preparation:
- Do not centrifuge, refrigerate or freeze samples.

- Transport to China Basin Cytogenetics asap.

Synonyms:
- TEL/AML1 translocation FISH, ETV6/RUNX1 translocation FISH

Stability (from collection to initiation):
- Room temperature 2 days

Printed 06/07/19
Test information subject to change
Reported:
  1-2 weeks
CPT Codes:
  88271 x2, 88275
LDT or Modified FDA:
  Yes
Translocation 14 / 16 FISH
TR1416, BT1416

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily Monday - Friday
Methodology:
Fluorescent In-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
• IGH/MAF Translocation
• TR1416
• BT1416

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy
Collect:
Dark green top (Sodium heparin)
Amount to Collect:
See preferred volume.
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING

Test Code:
BT1416: Blood
TR1416: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Keep at room temperature, do not centrifuge
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

**Stability (from collection to initiation):**
- Room temperature 2 days

---

**RESULT INTERPRETATION**

**Reference Interval:**
- Absent

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**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
- Yes

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- BT1416: Blood
- TR1416: Bone marrow

**Performing Lab:**
- Medical Genomics - Cytogenetics

**Performed:**
- Set up daily Monday - Friday

**Methodology:**
- Fluorescent In-situ hybridization (FISH)

**Remarks:**
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

**Collect:**
- Dark green top (Sodium heparin)

**Amount to Collect:**
- See preferred volume.

**Sample Type:**
- Heparinized whole blood or bone marrow. Bone marrow biopsy

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
- Frozen, leaking or unlabeled samples

**Specimen Preparation:**
- Keep at room temperature, do not centrifuge
Reference Interval:
Absent

Synonyms:
- IGH/MAF Translocation
- TR1416
- BT1416

Stability (from collection to initiation):
Room temperature 2 days

Reported:
1-2 weeks

CPT Codes:
88271 x2, 88275

LDT or Modified FDA:
Yes
Translocation 14/18 FISH
TR1418, BT1418

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-situ hybridization (FISH)
Reported: 7-14 days
Synonyms:
- IGH/BCL2
- Follicular DLBCL FISH
- TR1418
- BT1418

COLLECTION

Sample Type: Heparinized whole blood, bone marrow, bone core
Collect: Dark Green top
Amount to Collect: See preferred volume.
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Remarks: Mix sample well by gentle inversion.
Stability (from collection to initiation): 48 hours
Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
- BT1418: Blood
- TR1418: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation: Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL

Test information subject to change
Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
- 48 hours

RESULT INTERPRETATION

Reference Interval:
- Not detected

ADMINISTRATIVE

CPT Codes:
- 88271 x2, 88275 x1

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BT1418: Blood
- TR1418: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Methodology:
- Fluorescent in-situ hybridization (FISH)

Remarks:
- Mix sample well by gentle inversion.

Collect:
- Dark Green top

Amount to Collect:
- See preferred volume.

Sample Type:
- Heparinized whole blood, bone marrow, bone core

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
- Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:
- Not detected

Synonyms:
- IGH/BCL2
- Follicular DLBCL FISH
- TR1418
- BT1418

**Stability (from collection to initiation):**
48 hours

**Reported:**
7-14 days

**CPT Codes:**
- 88271 x2, 88275 x1

**LDT or Modified FDA:**
Yes

Test information subject to change
Translocation 14/20 IGH/MAFB FISH
BT1420, TR1420

ORDERING

Performing Lab:
Cytogenetics
Performed:
Mon - Fri 9am to 5pm
Methodology:
FISH
Reported:
7~14 days
Synonyms:
- IGH/MAFB rearrangement FISH, IGH/MAFB Dual Fusion Rearrangement FISH

COLLECTION

Sample Type:
Dark Green top Sodium Heparin tube
Collect:
Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.
Amount to Collect:
2ml
Preferred Volume:
2ml
Minimum Volume:
1ml
Remarks:
Mix well, do not spin, keep at room temperature.
Stability (from collection to initiation):
48 hours
Unacceptable Conditions:
Leaking, frozen and unlabeled samples.

PROCESSING

Test Code:
BT1420: Blood
TR1420: Non-blood
Test Group:
Cytogenetics
Performing Lab:
Cytogenetics
Specimen Preparation:
Do not refrigerate or freeze sample, call lab before sample rejection.
Preferred Volume:
2ml
Minimum Volume:
1ml
Unacceptable Conditions:
Leaking, frozen and unlabeled samples.
Stability (from collection to initiation):
48 hours
ADMINISTRATIVE

CPT Codes:
88271x1, 88271x1, 88275x1
LDT or Modified FDA:
Yes

COMPLETE VIEW

Test Code:
BT1420: Blood
TR1420: Non-blood
Test Group:
Cytogenetics
Performing Lab:
Cytogenetics
Performed:
Mon - Fri 9am to 5pm
Methodology:
FISH
Remarks:
Mix well, do not spin, keep at room temperature.
Collect:
Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.
Amount to Collect:
2ml
Sample Type:
Dark Green top Sodium Heparin tube
Preferred Volume:
2ml
Minimum Volume:
1ml
Unacceptable Conditions:
Leaking, frozen and unlabeled samples.
Specimen Preparation:
Do not refrigerate or freeze sample, call lab before sample rejection.
Synonyms:
- IGH/MAFB rearrangement FISH, IGH/MAFB Dual Fusion Rearrangement FISH
Stability (from collection to initiation):
48 hours
Reported:
7~14 days
CPT Codes:
88271x1, 88271x1, 88275x1
LDT or Modified FDA:
Yes

Printed 06/07/19
Test information subject to change
Translocation 1q/19p FISH
TR119, BT119

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-Situ Hybridization
Reported: 1-2 weeks
Synonyms:
- Translocation PBX1/TCF3FISH
- TR119

COLLECTION

Sample Type:
- Heparinized blood or bone marrow aspirate
- Bone biopsy
Collect:
- Blood or marrow aspirate: Dark Green top
Amount to Collect:
- See preferred volume.
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Remarks:
- Mix blood and marrow aspirates well
Stability (from collection to initiation):
- 2 days at room temperature
Unacceptable Conditions:
- Insufficient sample or not collected in heparin

PROCESSING

Test Code:
- BT119: Blood
- TR119: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Specimen Preparation:
- Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
Insufficient sample or not collected in heparin

**Stability (from collection to initiation):**
2 days at room temperature

**ADMINISTRATIVE**

**CPT Codes:**
- 88271 x2, 88275

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
- 59050-5, 29308-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
- BT119: Blood
- TR119: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Methodology:**
Fluorescent in-Situ Hybridization

**Remarks:**
Mix blood and marrow aspirates well

**Collect:**
Blood or marrow aspirate: Dark Green top

**Amount to Collect:**
See preferred volume.

**Sample Type:**
- Heparinized blood or bone marrow aspirate
- Bone biopsy

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
Insufficient sample or not collected in heparin

**Specimen Preparation:**
Maintain sample at room temperature; Do Not Refrigerate or freeze. Do Not centrifuge.

**Synonyms:**
- Translocation PBX1/TCF3 FISH
- TR119

**Stability (from collection to initiation):**
2 days at room temperature
Reported: 
1-2 weeks
CPT Codes: 
88271 x2, 88275
LDT or Modified FDA: 
Yes
LOINC Codes: 
59050-5, 29308-4
Translocation 4 / 14 FISH
TR414, BT414

ORDERING
Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Performed:
Set up daily Monday - Friday
Methodology:
Fluorescent In-situ hybridization (FISH)
Reported:
1-2 weeks
Synonyms:
- IGH/FGNR3 Translocation
- T414
- T4:14
- TR414
- BT414

COLLECTION
Sample Type:
Heparinized whole blood or bone marrow
Bone marrow biopsy
Collect:
Dark green top (Sodium heparin)
Amount to Collect:
See preferred volume.
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature
Stability (from collection to initiation):
Room temperature 2 days
Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING
Test Code:
BT414: Blood
TR414: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
   Keep at room temperature, do not centrifuge

Preferred Volume:
   Whole blood: 2 mL
   Bone marrow aspirate: 2 mL
   Bone marrow biopsy: 2 cm

Minimum Volume:
   Whole blood: 1 mL
   Bone marrow aspirate: 1 mL
   Bone marrow biopsy: 1 cm

Unacceptable Conditions:
   Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
   Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
   Absent

ADMINISTRATIVE

CPT Codes:
   88271 x2, 88275

LDT or Modified FDA:
   Yes

COMPLETE VIEW

Available Stat:
   No

Test Code:
   BT414: Blood
   TR414: Bone marrow

Performing Lab:
   Medical Genomics - Cytogenetics

Performed:
   Set up daily Monday - Friday

Methodology:
   Fluorescent In-situ hybridization (FISH)

Remarks:
   Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
   Dark green top (Sodium heparin)

Amount to Collect:
   See preferred volume.

Sample Type:
   Heparinized whole blood or bone marrow
   Bone marrow biopsy

Preferred Volume:
   Whole blood: 2 mL
   Bone marrow aspirate: 2 mL
   Bone marrow biopsy: 2 cm

Minimum Volume:
   Whole blood: 1 mL
   Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled samples

Specimen Preparation:
- Keep at room temperature, do not centrifuge

Reference Interval:
- Absent

Synonyms:
- IGH/FGNR3 Translocation
- T414
- T4:14
- TR414
- BT414

Stability (from collection to initiation):
- Room temperature 2 days

Reported:
- 1-2 weeks

CPT Codes:
- 88271 x2, 88275

LDT or Modified FDA:
- Yes
Translocation 6/14 CCND3/IGH FISH
TR614, BT614

ORDERING

Performing Lab:
Cytogenetics
Performed:
Mon - Fri 9 am to 5 pm
Methodology:
FISH
Reported:
7~14 days
Synonyms:
- IGH/CCND3 Translocation, Dual Fusion FISH,

COLLECTION

Sample Type:
Dark Green top Sodium Heparin tube
Collect:
Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core.
Amount to Collect:
2ml
Preferred Volume:
2ml
Minimum Volume:
1ml
Remarks:
Mix well, do not spin, keep at room temperature.
Stability (from collection to initiation):
48 hours
Unacceptable Conditions:
Leaking, frozen and unlabeled samples.

PROCESSING

Test Code:
TR614: Non-Blood
BT614: Blood
Test Group:
Cytogenetics
Performing Lab:
Cytogenetics
Specimen Preparation:
Do not refrigerate or freeze sample, call lab before sample rejection.
Preferred Volume:
2ml
Minimum Volume:
1ml
Unacceptable Conditions:
Leaking, frozen and unlabeled samples.
Stability (from collection to initiation):
48 hours

Printed 06/07/19
Test information subject to change


**ADMINISTRATIVE**

CPT Codes: 
88271x1, 88271x1, 88275x1
LDT or Modified FDA: 
Yes

**COMPLETE VIEW**

Test Code: 
TR614: Non-Blood 
BT614: Blood 
Test Group: 
Cytogenetics 
Performing Lab: 
Cytogenetics 
Performed: 
Mon - Fri 9 am to 5 pm 
Methodology: 
FISH 
Remarks: 
Mix well, do not spin, keep at room temperature. 
Collect: 
Dark Green top Sodium Heparin tube for bone marrow, sterile container with medium for bone core. 
Amount to Collect: 
2ml 
Sample Type: 
Dark Green top Sodium Heparin tube 
Preferred Volume: 
2ml 
Minimum Volume: 
1ml 
Unacceptable Conditions: 
Leaking, frozen and unlabeled samples. 
Specimen Preparation: 
Do not refrigerate or freeze sample, call lab before sample rejection. 
Synonyms: 
IGH/CCND3 Translocation, Dual Fusion FISH, 
Stability (from collection to initiation): 
48 hours 
Reported: 
7~14 days 
CPT Codes: 
88271x1, 88271x1, 88275x1 
LDT or Modified FDA: 
Yes
Translocation 6/9 FISH
BT69, TR69

ORDERING

Performing Lab: Cytogenetics
Performed: Mon - Fri 9 am to 5 pm
Methodology: FISH
Reported: 7~14 days
Synonyms:
- BT69
- DEK NUP214 Dual Fusion Translocation FISH
- TR69

COLLECTION

Sample Type: Blood, bone marrow aspirate, bone marrow core
Collect:
- Blood: Dark Green top Sodium Heparin Tube
- Bone marrow: Dark Green top Sodium Heparin tube for Bone Marrow, sterile container with media for bone core
Amount to Collect:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm
Stability (from collection to initiation):
- 2 days
Storage/Transport Temperature:
- Room temperature
Unacceptable Conditions:
- Clotted samples, samples received refrigerated or frozen

PROCESSING

Test Code:
- Blood: BT69
- Bone marrow: TR69
Performing Lab: Cytogenetics
Preferred Volume:
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm
Minimum Volume:

- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:

- Clotted samples, samples received refrigerated or frozen

Stability (from collection to initiation):

- 2 days

Storage/Transport Temperature:

- Room temperature

ADMINISTRATIVE

CPT Codes:

- 88271x2, 88275x1

COMPLETE VIEW

Test Code:

- Blood: BT69
- Bone marrow: TR69

Performing Lab:

- Cytogenetics

Performed:

- Mon - Fri 9 am to 5 pm

Methodology:

- FISH

Collect:

- Blood: Dark Green top Sodium Heparin Tube
- Bone marrow: Dark Green top Sodium Heparin tube for Bone Marrow, sterile container with media for bone core

Amount to Collect:

- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Sample Type:

- Blood, bone marrow aspirate, bone marrow core

Preferred Volume:

- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

Minimum Volume:

- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

Unacceptable Conditions:

- Clotted samples, samples received refrigerated or frozen

Synonyms:

- BT69
- DEK NUP214 Dual Fusion Translocation FISH
- TR69

Storage/Transport Temperature:

- Room temperature

Stability (from collection to initiation):

- 2 days

Reported:

- 7~14 days
CPT Codes:
88271x2, 88275x1
Translocation 8/14 FISH
TR814, BT814

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization (FISH)
Reported:
7-14 days
Synonyms:
- IGH/MYC Burkitt Lymphoma FISH
- TR814
- BT814

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core
Collect:
Dark Green top
Amount to Collect:
See preferred volume.
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Remarks:
Mix sample well by gentle inversion.
Stability (from collection to initiation):
48 hours
Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
BT814: Blood
TR814: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Specimen Preparation:
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL
  Bone marrow biopsy: 1 cm

Unacceptable Conditions:
  Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Stability (from collection to initiation):
  48 hours

RESULT INTERPRETATION

Reference Interval:
  Not detected

ADMINISTRATIVE

CPT Codes:
  88271 x2, 88275 x1

LDT or Modified FDA:
  Yes

COMPLETE VIEW

Available Stat:
  No

Test Code:
  BT814: Blood
  TR814: Bone marrow

Performing Lab:
  Medical Genomics - Cytogenetics

Methodology:
  Fluorescent in-situ hybridization (FISH)

Remarks:
  Mix sample well by gentle inversion.

Collect:
  Dark Green top

Amount to Collect:
  See preferred volume.

Sample Type:
  Heparinized whole blood, bone marrow, bone core

Preferred Volume:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm

Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL
  Bone marrow biopsy: 1 cm

Unacceptable Conditions:
  Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:
  Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:
  Not detected

Synonyms:
  • IGH/MYC Burkitt Lymphoma FISH
- TR814
- BT814

**Stability (from collection to initiation):**
48 hours

** Reported:**
7-14 days

**CPT Codes:**
88271 x2, 88275 x1

**LDT or Modified FDA:**
Yes
Translocation 8/9 FISH
BT89, TR89

ORDERING

Performing Lab:
Cytogenetics

Performed:
Mon - Fri 9 am to 5 pm

Methodology:
FISH

Reported:
7~14 days

Synonyms:
- PCM1 JAK2 Dual Fusion Translocation FISH
- BT89
- TR89

COLLECTION

Sample Type:
Blood, bone marrow aspirate, bone marrow core

Collect:
Blood: Dark Green top Sodium Heparin tube
Bone marrow: Dark Green top Sodium Heparin tube for bone marrow, sterile container with media for bone core.

Amount to Collect:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

Minimum Volume:
Blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow core: 1 cm

Stability (from collection to initiation):
2 days

Storage/Transport Temperature:
Room temperature

Unacceptable Conditions:
Clotted samples, samples received refrigerated or frozen.

PROCESSING

Test Code:
Blood: BT89
Bone marrow: TR89

Performing Lab:
Cytogenetics

Preferred Volume:
Blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples, samples received refrigerated or frozen.

**Stability (from collection to initiation):**
- 2 days

**Storage/Transport Temperature:**
- Room temperature

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**ADMINISTRATIVE**

**CPT Codes:**
- 88271x2, 88275x1

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**COMPLETE VIEW**

**Test Code:**
- Blood: BT89
- Bone marrow: TR89

**Performing Lab:**
- Cytogenetics

**Performed:**
- Mon - Fri 9 am to 5 pm

**Methodology:**
- FISH

**Collect:**
- Blood: Dark Green top Sodium Heparin tube
- Bone marrow: Dark Green top Sodium Heparin tube for bone marrow, sterile container with media for bone core.

**Amount to Collect:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Sample Type:**
- Blood, bone marrow aspirate, bone marrow core

**Preferred Volume:**
- Blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow core: 2 cm

**Minimum Volume:**
- Blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow core: 1 cm

**Unacceptable Conditions:**
- Clotted samples, samples received refrigerated or frozen.

**Synonyms:**
- PCM1 JAK2 Dual Fusion Translocation FISH
- BT89
- TR89

**Storage/Transport Temperature:**
- Room temperature

**Stability (from collection to initiation):**
- 2 days
Reported:

7-14 days

CPT Codes:

88271x2, 88275x1
Translocation 8:21 FISH
TR821, BT821

ORDERING

Available Stat: No
Performing Lab: Medical Genomics - Cytogenetics
Methodology: Fluorescent in-situ hybridization
Reported: 1-2 weeks
Synonyms:
- Translocation 8/21
- TR821
- BT821

COLLECTION

Sample Type: Heparinized whole blood, bone marrow, bone core
Collect: Dark green top (Na-heparin)
Amount to Collect: See preferred volume.
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Remarks: Mix sample well, keep at room temperature.
Stability (from collection to initiation):
Room temperature 2 days

PROCESSING

Test Code:
- BT821: Blood
- TR821: Bone marrow
Performing Lab: Medical Genomics - Cytogenetics
Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm
Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm
Stability (from collection to initiation):
Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
No translocation

ADMINISTRATIVE

CPT Codes:
88271, 88271, 88275
LDT or Modified FDA:
Yes

COMPLETE VIEW

Available Stat:
No
Test Code:
BT821: Blood
TR821: Bone marrow
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization
Remarks:
Mix sample well, keep at room temperature.
Collect:
Dark green top (Na-heparin)
Amount to Collect:
See preferred volume.
Sample Type:
Heparinized whole blood, bone marrow, bone core
Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm
Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm
Reference Interval:
No translocation
Synonyms:
• Translocation 8/21
• TR821
• BT821
Stability (from collection to initiation):
Room temperature 2 days
Reported:
1-2 weeks
CPT Codes:
88271, 88271, 88275
LDT or Modified FDA:
Yes
Transplant DONOR ID Screen+NAT  
PTXID

ORDERING

Available Stat:
No

Performing Lab:
Creative Testing Solutions & Immunology

Reported:
Donor infectious disease testing is sent out to CTS, results are available 48-72 hours after samples are sent out.

Additional Information:
This test package should be ordered for stem cell, tissue and organ donors (including both allogeneic and autologous bone marrow donors). This package includes the infectious disease screening assays mandated for donor screening plus Cytomegalovirus antibody (Total), Hepatitis B Surface Antibody, antibodies to Trypanosoma cruzi and nucleic acid testing for Hepatitis B (HBV).

This test package should NOT be ordered on allogeneic recipients. The BMID panel should be ordered instead.

The FDA mandates that blood, tissue, stem cell and organ donors are tested using the PTXID panel including the nucleic acid tests (NAT) for HIV, HCV and WNV. These NAT tests are performed on individual samples and are not pooled (as for blood donors).

Mandated panel (as of December 2005) includes: HBsAg, antibodies to HBcore, HCV, HIV-1/2, HTLV-I/II, Syphilis (RPR), and nucleic acid tests for HIV, HCV, and WNV.

The assays in the Pre-Transplant Infectious Disease Screening are those which are mandated by the FDA and AABB for donor screening. If additional tests are required, they must be ordered in addition to these panels and would be billed separately.

For information about sample send-out call the Processing lab at 353-1667. For questions regarding test results please call the Immunology Laboratory at 353-1712.

EMERGENT TESTING:
For situations requiring emergent testing please call Immunology for details.

Synonyms:
- NAT
- nucleic acid testing
- Pre-transplant infectious disease screening panel
- PTXID

COLLECTION

Sample Type:
EDTA whole blood plus serum

Collect:
Lavender top 6 mL x 2, AND Red top 6 mL AND Gold top 5 mL

Amount to Collect:
12 mL EDTA whole blood AND
6 mL Red top AND
5 mL Gold top

Preferred Volume:
12 mL EDTA whole blood AND
3 mL Red top serum AND
3 mL Gold top serum

Remarks:
Note that the large 6.0 mL lavender top tubes MUST be used for collection of samples. The smaller 3.0 mL lavender tubes are NOT acceptable.

Do not draw samples for this screening panel on weekends and holidays. Samples drawn on Fridays and the day before holidays must...
be received in the lab by 12 noon.

**Note:** the collection tubes and amounts listed are for this set of screening tests only. Additional tests cannot be performed on these samples. If additional tests are requested at the same time then additional samples must be collected for them separately.

**Stability (from collection to initiation):**
Samples must be received by CTS within 72 hours of collection for donor infectious disease testing.

**Unacceptable Conditions:**
EDTA whole blood collected in 3 mL tubes.

**Rejection Criteria:**
Samples > 72 hours old on receipt by CTS.

## PROCESSING

**Test Code:**
PTXID

**Test Group:**
Pre-transplant testing

**Sendout:**
Yes

**Performing Lab:**
Creative Testing Solutions & Immunology

**Specimen Preparation:**
Samples are sent out to CTS Monday to Friday afternoon by the Send-out Processing Department at China Basin for Donor infectious disease testing. Do not draw samples for PTXID on weekends and holidays. Samples drawn on Fridays and the day before holidays must be received in the lab by 12 noon.

Do not centrifuge EDTA tubes. Refrigerate all samples and transport at 4°C.

**Preferred Volume:**
12 mL EDTA whole blood **AND**
3 mL Red top serum **AND**
3 mL Gold top serum

**Unacceptable Conditions:**
EDTA whole blood collected in 3 mL tubes.

**Rejection Criteria:**
Samples > 72 hours old on receipt by CTS.

**Stability (from collection to initiation):**
Samples must be received by CTS within 72 hours of collection for donor infectious disease testing.

## RESULT INTERPRETATION

**Additional Information:**
This test package should be ordered for stem cell, tissue and organ donors (including both allogeneic and autologous bone marrow donors). This package includes the infectious disease screening assays mandated for donor screening plus Cytomegalovirus antibody (Total), Hepatitis B Surface Antibody, antibodies to Trypanosoma cruzi and nucleic acid testing for Hepatitis B (HBV).

This test package should **NOT** be ordered on allogeneic recipients. The BMID panel should be ordered instead.

The FDA mandates that blood, tissue, stem cell and organ donors are tested using the PTXID panel including the nucleic acid tests (NAT) for HIV, HCV and WNV. These NAT tests are performed on individual samples and are not pooled (as for blood donors).

Mandated panel (as of December 2005) includes: HBsAg, antibodies to HBcore, HCV, HIV-1/2, HTLV-I/II, Syphilis (RPR), and nucleic acid tests for HIV,HCV,and WNV.

The assays in the Pre-Transplant Infectious Disease Screening are those which are mandated by the FDA and AABB for donor screening. If additional tests are required, they must be ordered in addition to these panels and would be billed separately.

For information about sample send-out call the Processing lab at 353-1667. For questions regarding test results please call the Immunology Laboratory at 353-1712.
EMERGENT TESTING:
For situations requiring emergent testing please call Immunology for details.

ADMINISTRATIVE

CPT Codes:
87340-90, 86704-90, 86803-90, 86790-90, 86703-90, 86592-90, 87798-90, 87801-90

COMPLETE VIEW

Available Stat:
No
Test Code:
PTXID
Test Group:
Pre-transplant testing
Performing Lab:
Creative Testing Solutions & Immunology
Sendout:
Yes
Remarks:
Note that the large 6.0 mL lavender top tubes MUST be used for collection of samples. The smaller 3.0 mL lavender tubes are NOT acceptable.

Do not draw samples for this screening panel on weekends and holidays. Samples drawn on Fridays and the day before holidays must be received in the lab by 12 noon.

Note: the collection tubes and amounts listed are for this set of screening tests only. Additional tests cannot be performed on these samples. If additional tests are requested at the same time then additional samples must be collected for them separately.

Collect:
Lavender top 6 mL x 2, AND Red top 6 mL AND Gold top 5 mL

Amount to Collect:
12 mL EDTA whole blood AND
6 mL Red top AND
5 mL Gold top

Sample Type:
EDTA whole blood plus serum

Preferred Volume:
12 mL EDTA whole blood AND
3 mL Red top serum AND
3 mL Gold top serum

Rejection Criteria:
Samples > 72 hours old on receipt by CTS.

Unacceptable Conditions:
EDTA whole blood collected in 3 mL tubes.

Specimen Preparation:
Samples are sent out to CTS Monday to Friday afternoon by the Send-out Processing Department at China Basin for Donor infectious disease testing. Do not draw samples for PTXID on weekends and holidays. Samples drawn on Fridays and the day before holidays must be received in the lab by 12 noon.

Do not centrifuge EDTA tubes. Refrigerate all samples and transport at 4C.

Synonyms:
- NAT
- nucleic acid testing
- Pre-transplant infectious disease screening panel
- PTXID
Stability (from collection to initiation):
Samples must be received by CTS within 72 hours of collection for donor infectious disease testing.

Reported:
Donor infectious disease testing is sent out to CTS, results are available 48-72 hours after samples are sent out.

Additional Information:
This test package should be ordered for stem cell, tissue and organ donors (including both allogeneic and autologous bone marrow donors). This package includes the infectious disease screening assays mandated for donor screening plus Cytomegalovirus antibody (Total), Hepatitis B Surface Antibody, antibodies to Trypanosoma cruzi and nucleic acid testing for Hepatitis B (HBV).

This test package should NOT be ordered on allogeneic recipients. The BMID panel should be ordered instead.

The FDA mandates that blood, tissue, stem cell and organ donors are tested using the PTXID panel including the nucleic acid tests (NAT) for HIV, HCV and WNV. These NAT tests are performed on individual samples and are not pooled (as for blood donors).

Mandated panel (as of December 2005) includes: HBsAg, antibodies to HBcore, HCV, HIV-1/2, HTLV-I/II, Syphilis (RPR), and nucleic acid tests for HIV, HCV, and WNV.

The assays in the Pre-Transplant Infectious Disease Screening are those which are mandated by the FDA and AABB for donor screening. If additional tests are required, they must be ordered in addition to these panels and would be billed separately.

For information about sample send-out call the Processing lab at 353-1667. For questions regarding test results please call the Immunology Laboratory at 353-1712.

EMERGENT TESTING:
For situations requiring emergent testing please call Immunology for details.

CPT Codes:
87340-90, 86704-90, 86803-90, 86790-90, 86703-90, 86592-90, 87798-90, 87801-90
Transplant RECIPIENT ID Screen
BMID

ORDERING

Available Stat:
No
Performing Lab:
Immunology

Additional Information:
Panel contains the following tests: Hepatitis B surface Ag, Hepatitis B core Ab, Hepatitis C Ab, HIV Ab/Ag, Syphilis Screening, CMV Ab, and Hepatitis B Ab

The minimum amount of serum for serologic screening may be insufficient for confirmation of a positive test.

Synonyms:
• BMID

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top

Amount to Collect:
5 mL blood (Gold top)
6 mL blood (Red top)

Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum

PROCESSING

Test Code:
BMID
Test Group:
Pre-transplant testing
Performing Lab:
Immunology

Specimen Preparation:
Contains the following test codes: HBAG, CORE, HCV, HIVAA, RPR, CMVAB, HBAB

Preferred Volume:
3 mL serum
Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Additional Information:
Panel contains the following tests: Hepatitis B surface Ag, Hepatitis B core Ab, Hepatitis C Ab, HIV Ab/Ag, Syphilis Screening, CMV Ab, and Hepatitis B Ab

The minimum amount of serum for serologic screening may be insufficient for confirmation of a positive test.
Available Stat: No
Test Code: BMID
Test Group: Pre-transplant testing
Performing Lab: Immunology
Collect: Gold top, Red top
Amount to Collect:
5 mL blood (Gold top)
6 mL blood (Red top)
Sample Type: Serum
Preferred Volume: 3 mL serum
Minimum Volume: 1 mL serum
Specimen Preparation:
Contains the following test codes: HBAG, CORE, HCV, HIVAA, RPR, CMVAB, HBAB
Synonyms:
• BMID
Additional Information:
Panel contains the following tests: Hepatitis B surface Ag, Hepatitis B core Ab, Hepatitis C Ab, HIV Ab/Ag, Syphilis Screening, CMV Ab, and Hepatitis B Ab

The minimum amount of serum for serologic screening may be insufficient for confirmation of a positive test.
Trazodone
TRAZ

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test run Thursday AM only. Turnaround time: 3-10 days.
Additional Information:
Some patients respond to substantially lower levels.
Synonyms:
• Desyrel

COLLECTION

Sample Type:
Serum or EDTA plasma
Collect:
Red top or Lavender top (Gold top NOT acceptable),
Amount to Collect:
3 mL blood
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Remarks:
Do not collect in serum separator tube (SST; Gold top)
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 2 months
Unacceptable Conditions:
Collected in Gold top.

PROCESSING

Test Code:
TRAZ
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Refrigerate serum. Order Quest # 4732X. For B&T patients order LabCorp test #071688
Preferred Volume:
1 mL serum or plasma
Minimum Volume:
0.5 mL serum or plasma
Unacceptable Conditions:
Collected in Gold top.
Stability (from collection to initiation):
   Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 2 months

RESULT INTERPRETATION

Units:
   ng/mL

Reference Interval:
   Therapeutic: 800-1600 ng/mL

Additional Information:
   Some patients respond to substantially lower levels.

ADMINISTRATIVE

CPT Codes:
   80299-90

LOINC Codes:
   4064-2

COMPLETE VIEW

Available Stat:
   No

Test Code:
   TRAZ

Performing Lab:
   Quest

Sendout:
   Yes

Methodology:
   HPLC

Remarks:
   Do not collect in serum separator tube (SST; Gold top)

Collect:
   Red top or Lavender top (Gold top NOT acceptable),

Amount to Collect:
   3 mL blood

Sample Type:
   Serum or EDTA plasma

Preferred Volume:
   1 mL serum or plasma

Minimum Volume:
   0.5 mL serum or plasma

Unacceptable Conditions:
   Collected in Gold top.

Specimen Preparation:
   Refrigerate serum. Order Quest # 4732X. For B&T patients order LabCorp test #071688

Units:
   ng/mL

Reference Interval:
   Therapeutic: 800-1600 ng/mL

Synonyms:
   • Desyrel
Room temperature 1 week, refrigerated 2 weeks, frozen at -20°C 2 months

**Reported:**
- Test run Thursday AM only. Turnaround time: 3-10 days.

**Additional Information:**
- Some patients respond to substantially lower levels.

**CPT Codes:**
- 80299-90

**LOINC Codes:**
- 4064-2
Treponemal Antibody Only
TREPAB

ORDERING

Performing Lab:
Immunology

Performed:
Weekdays (day shift)

Methodology:
Microparticle Chemiluminescent Immunoassay

Reported:
1-5 days

Additional Information:
This test is a treponemal antibody test performed by chemiluminescent immunoassay. Following syphilis infection, this test stays positive even after successful treatment. False positive results can occur, particularly in patients with autoimmune disease, and cross-reactivity may occur with non-syphilis treponemal infections.

To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/ Reflex to Treponemal Ab.

Synonyms:
- MHA-TP
- FTA-Abs
- T. pallidum
- MHATP
- Syphilis
- Treponema pallidum

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Remarks:
Avoid hemolysis, transport to laboratory as soon as possible. If transport is delayed refrigerate the sample.

Stability (from collection to initiation):
Refrigerated: 7 days
Frozen, -20 C or colder: > 7 days

Unacceptable Conditions:
Grossly lipemic, grossly hemolysed or contaminated samples

PROCESSING

Test Code:
TREPAB

Test Group:
Syphilis
Performing Lab: Immunology

Specimen Preparation:
Freeze sample and transport to CB frozen

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

Unacceptable Conditions:
Grossly lipemic, grossly hemolyzed or contaminated samples

Stability (from collection to initiation):
Refrigerated: 7 days
Frozen, -20 C or colder: > 7 days

RESULT INTERPRETATION

Reference Interval:
Non-reactive

Additional Information:
This test is a treponemal antibody test performed by chemiluminescent immunoassay. Following syphilis infection, this test stays positive even after successful treatment. False positive results can occur, particularly in patients with autoimmune disease, and cross-reactivity may occur with non-syphilis treponemal infections.

To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/ Reflex to Treponemal Ab.

ADMINISTRATIVE

CPT Codes:
86780

LOINC Codes:
24110-9

COMPLETE VIEW

Test Code:
TREPAB

Test Group:
Syphilis

Performing Lab:
Immunology

Performed:
Weekdays (day shift)

Methodology:
Microparticle Chemiluminescent Immunoassay

Remarks:
Avoid hemolysis, transport to laboratory as soon as possible. If transport is delayed refrigerate the sample.

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.5 mL serum

**Unacceptable Conditions:**
- Grossly lipemic, grossly hemolysed or contaminated samples

**Specimen Preparation:**
- Freeze sample and transport to CB frozen

**Reference Interval:**
- Non-reactive

**Synonyms:**
- MHA-TP
- FTA-Abs
- T. pallidum
- MHATP
- Syphilis
- Treponema pallidum

**Stability (from collection to initiation):**
- Refrigerated: 7 days
- Frozen, -20 C or colder: > 7 days

**Reported:**
- 1-5 days

**Additional Information:**
This test is a treponemal antibody test performed by chemiluminescent immunoassay. Following syphilis infection, this test stays positive even after successful treatment. False positive results can occur, particularly in patients with autoimmune disease, and cross-reactivity may occur with non-syphilis treponemal infections.

To screen for syphilis in patients with unknown status, please order RPRSCR - Syphilis Screen by RPR w/ Reflex to Treponemal Ab.

**CPT Codes:**
- 86780

**LOINC Codes:**
- 24110-9
TRH Stimulation Test

ORDERING

Available Stat:
No

Performing Lab:
China Basin Chemistry

Performed:
Daily (day shift)

Methodology:
Post-TRH measurement of TSH

Reported:
1 day

Additional Information:
TRH (Thyroliberin) stimulation is useful only if results of the standard tests (TSH, Free T4) are equivocal. Responses are exaggerated in primary hypothyroidism, decreased in hyperthyroidism (natural or factitious) and in TSH deficiency.

After IV administration of TRH, TSH normally rises 2- to 4-fold over baseline values. In subclinical hyperthyroidism and in hypothyroidism secondary to pituitary failure TSH levels do not rise normally; in primary hypothyroidism the response to TRH is exaggerated. TRH Stimulation was previously helpful when results of the T4 Index and TSH were equivocal, but with the advent of sensitive and accurate assays for TSH and Free T4, it has fallen into disuse.

Also see Prolactin-TRH Stimulation.

Synonyms:
- TSH releasing Hormone

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Remarks:
Collect specimens at 0 and 15 or 30 minutes after giving 500 µg of TRH iv, and submit them for assay of TSH. Be sure to note the time directly on each of the two samples

PROCESSING

Test Group:
Thyroid tests

Performing Lab:
China Basin Chemistry

Preferred Volume:
1 mL serum

RESULT INTERPRETATION

Units:
mIU/L

Reference Interval:

Printed 06/07/19
Test information subject to change
TSH 2-4x basal and > 10 mIU/L 15-30 min post-TRH

Additional Information:

TRH (Thyroliberin) stimulation is useful only if results of the standard tests (TSH, Free T4) are equivocal. Responses are exaggerated in primary hypothyroidism, decreased in hyperthyroidism (natural or factitious) and in TSH deficiency.

After IV administration of TRH, TSH normally rises 2- to 4-fold over baseline values. In subclinical hyperthyroidism and in hypothyroidism secondary to pituitary failure TSH levels do not rise normally; in primary hypothyroidism the response to TRH is exaggerated. TRH Stimulation was previously helpful when results of the T4 Index and TSH were equivocal, but with the advent of sensitive and accurate assays for TSH and Free T4, it has fallen into disuse.

Also see Prolactin-TRH Stimulation.

Available Stat:
No

Test Group:
Thyroid tests

Performing Lab:
China Basin Chemistry

Performed:
Daily (day shift)

Methodology:
Post-TRH measurement of TSH

Remarks:
Collect specimens at 0 and 15 or 30 minutes after giving 500 µg of TRH iv, and submit them for assay of TSH. Be sure to note the time directly on each of the two samples

Collect:
Gold top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Units:
mIU/L

Reference Interval:
TSH 2-4x basal and > 10 mIU/L 15-30 min post-TRH

Synonyms:
- TSH releasing Hormone

Reported:
1 day

Additional Information:

TRH (Thyroliberin) stimulation is useful only if results of the standard tests (TSH, Free T4) are equivocal. Responses are exaggerated in primary hypothyroidism, decreased in hyperthyroidism (natural or factitious) and in TSH deficiency.

After IV administration of TRH, TSH normally rises 2- to 4-fold over baseline values. In subclinical hyperthyroidism and in hypothyroidism secondary to pituitary failure TSH levels do not rise normally; in primary hypothyroidism the response to TRH is exaggerated. TRH Stimulation was previously helpful when results of the T4 Index and TSH were equivocal, but with the advent of sensitive and accurate assays for TSH and Free T4, it has fallen into disuse.

Also see Prolactin-TRH Stimulation.
Trichinella spiralis Antibody, IgG
TRICG

ORDERING

Available Stat:
No
Performing Lab:
Focus via Quest
Methodology:
ELISA
Reported:
Run once per week. Turnaround 2-8 days

Additional Information:
The Trichinella IgG ELISA employs an excretory-secretory antigen to reduce nonspecific reactivity; however, crossreactivity with other parasite antigens (e.g., strongyloides, filarial, malaria) may occur. The assay should be considered a screening test for Trichinella exposure; diagnosis of trichinosis requires a compatible patient history and supporting pathologic findings.

For examination of biopsy samples contact Anatomic pathology.

Synonyms:
- Trichinosis

COLLECTION

Sample Type:
Serum
Collect:
Gold top, Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.

PROCESSING

Test Code:
TRICG
Sendout:
Yes
Performing Lab:
Focus via Quest
Specimen Preparation:
Order Quest # 34321X
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room temperature 1 week, refrigerated 2 weeks, frozen 1 month.
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
The Trichinella IgG ELISA employs an excretory-secretory antigen to reduce nonspecific reactivity; however, crossreactivity with other parasite antigens (e.g., strongyloides, filarial, malaria) may occur. The assay should be considered a screening test for Trichinella exposure; diagnosis of trichinosis requires a compatible patient history and supporting pathologic findings.

For examination of biopsy samples contact Anatomic pathology.

ADMINISTRATIVE

CPT Codes:
86784-90

LOINC Codes:
32768-4

COMPLETE VIEW

Available Stat:
No

Test Code:
TRICG

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
ELISA

Collect:
Gold top, Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
0.3 mL serum

Specimen Preparation:
Order Quest # 34321X

Reference Interval:
Negative

Synonyms:
• Trichinosis

Stability (from collection to initiation):
Room temperature 1 week, refrigerator 2 weeks, frozen 1 month.

Reported:
Run once per week. Turnaround 2-8 days

Additional Information:
The Trichinella IgG ELISA employs an excretory-secretory antigen to reduce nonspecific reactivity; however, crossreactivity with other parasite antigens (e.g., strongyloides, filarial, malaria) may occur. The assay should be considered a screening test for Trichinella exposure; diagnosis of trichinosis requires a compatible patient history and supporting pathologic findings.

For examination of biopsy samples contact Anatomic pathology.
CPT Codes:
  86784-90
LOINC Codes:
  32768-4

Printed 06/07/19
Test information subject to change
Trichomonas vaginalis RNA
P715

ORDERING

Performing Lab:
Microbiology

Performed:
Test performed 3 times per week

Methodology:
Transcription Mediated Amplification

Reported:
1-3 days

Synonyms:
- Trichomonas

COLLECTION

Sample Type:
Endocervical, vaginal, male urethral

Collect:
Endocervical and male urethral: APTIMA Unisex swab collection kit; Vaginal: APTIMA Vaginal swab collection kit

Amount to Collect:
One swab; If C. trachomatis/N. gonorrhoeae testing also ordered, single swab may be sent for both CT/CG and Trichomonas testing

Remarks:
Do not discard fluid in the collection tube. Do not use expired swab collection kits. Swab collection kits are available from Material Services (Unisex swab PMM# 399818, Vaginal swab PMM# 59046).

Endocervical swab: Use the APTIMA Unisex Swab Specimen Collection Kit (white label on Swab Specimen Transport Tube).

1. Remove excess mucus from the cervical os and surrounding mucosa using the large, white shaft cleaning swab. Discard this swab.
2. Insert the small blue shaft collection swab into the endocervical canal. Gently rotate the swab clockwise for 10 to 30 seconds.
3. Withdraw the swab carefully, avoiding any contact with the vaginal mucosa.
4. Remove the cap from the swab specimen transport tube and immediately place the swab into the transport tube.
5. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
6. Recap the swab specimen transport tube tightly, label and ship to the lab.

Vaginal swab: Use the APTIMA Vaginal Swab Specimen Collection Kit (orange label on Vaginal Swab Transport Media tube)

1. Partially peel open the swab package. Remove the swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, the swab is laid down, or the swab is dropped, use a new APTIMA Vaginal Swab Specimen Collection Kit.
2. Hold the swab, placing your thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab shaft below the score line.
3. Carefully insert the swab into the vagina about 2 inches (5 cm) past the introitus and gently rotate the swab for 10 to 30 seconds. Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab and then withdraw the swab without touching the skin.
4. While holding the swab in the same hand, unscrew the cap from the tube. Do not spill the contents of the tube. If the contents of the tube are spilled, use a new APTIMA Vaginal Swab Specimen Collection Kit.
5. Immediately place the swab into the transport tube so that the score line is at the top of the tube.
6. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
7. Recap the swab transport media tube tightly, label and ship to the lab.
Male urethral swab: Use the APTIMA Unisex Swab Specimen Collection Kit (white label on Swab Specimen Transport Tube).

1. The patient should not have urinated for at least 1 hour prior to sample collection.
2. Insert the small blue shaft collection swab (NOT the larger white shaft cleaning swab) 2-4 cm into the urethra. Gently rotate the swab clockwise for 2-3 seconds.
3. Withdraw the swab carefully.
4. Remove the cap from the swab specimen transport tube and immediately place the swab into the transport tube.
5. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
6. Recap the swab specimen transport tube tightly, label and ship to the lab.

**Stability (from collection to initiation):**
- Room temperature or refrigerated 60 days

**Unacceptable Conditions:**
- Specimen received >60 days after collection, no swab in fluid, no fluid in tube

### PROCESSING

**Test Code:**
- P715

**Performing Lab:**
- Microbiology

**Specimen Preparation:**
- Male urethral swabs are not tested at UCSF. Give swab to supervisor to send to Quest (test code 90801)

**Unacceptable Conditions:**
- Specimen received >60 days after collection, no swab in fluid, no fluid in tube

**Stability (from collection to initiation):**
- Room temperature or refrigerated 60 days

### RESULT INTERPRETATION

**Reference Interval:**
- Not detected

### ADMINISTRATIVE

**CPT Codes:**
- 87661

**LOINC Codes:**
- 46154-1

### COMPLETE VIEW

**Test Code:**
- P715

**Performing Lab:**
- Microbiology

**Performed:**
- Test performed 3 times per week

**Methodology:**
- Transcription Mediated Amplification

**Remarks:**
- Do not discard fluid in the collection tube. Do not use expired swab collection kits. Swab collection kits are available from Material Services (Unisex swab PMM# 399818, Vaginal swab PMM# 59046 ).

Endocervical swab: Use the APTIMA Unisex Swab Specimen Collection Kit (white label on Swab Specimen Transport Tube).
1. Remove excess mucus from the cervical os and surrounding mucosa using the large, white shaft cleaning swab. Discard this swab.
2. Insert the small blue shaft collection swab into the endocervical canal. Gently rotate the swab clockwise for 10 to 30 seconds.
3. Withdraw the swab carefully, avoiding any contact with the vaginal mucosa.
4. Remove the cap from the swab specimen transport tube and immediately place the swab into the transport tube.
5. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
6. Recap the swab specimen transport tube tightly, label and ship to the lab.

Vaginal swab: Use the APTIMA Vaginal Swab Specimen Collection Kit (orange label on Vaginal Swab Transport Media tube)

1. Partially peel open the swab package. Remove the swab. Do not touch the soft tip or lay the swab down. If the soft tip is touched, the swab is laid down, or the swab is dropped, use a new APTIMA Vaginal Swab Specimen Collection Kit.
2. Hold the swab, placing your thumb and forefinger in the middle of the swab shaft covering the score line. Do not hold the swab shaft below the score line.
3. Carefully insert the swab into the vagina about 2 inches (5 cm) past the introitus and gently rotate the swab for 10 to 30 seconds. Make sure the swab touches the walls of the vagina so that moisture is absorbed by the swab and then withdraw the swab without touching the skin.
4. While holding the swab in the same hand, unscrew the cap from the tube. Do not spill the contents of the tube. If the contents of the tube are spilled, use a new APTIMA Vaginal Swab Specimen Collection Kit.
5. Immediately place the swab into the transport tube so that the score line is at the top of the tube.
6. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
7. Recap the swab transport media tube tightly, label and ship to the lab.

Male urethral swab: Use the APTIMA Unisex Swab Specimen Collection Kit (white label on Swab Specimen Transport Tube).

1. The patient should not have urinated for at least 1 hour prior to sample collection.
2. Insert the small blue shaft collection swab (NOT the larger white shaft cleaning swab) 2-4 cm into the urethra. Gently rotate the swab clockwise for 2-3 seconds.
3. Withdraw the swab carefully.
4. Remove the cap from the swab specimen transport tube and immediately place the swab into the transport tube.
5. Carefully break the swab shaft against the side of the tube at the score line and discard the top portion of the swab shaft, using care to avoid splashing of contents.
6. Recap the swab specimen transport tube tightly, label and ship to the lab.

Collect:
- Endocervical and male urethral: APTIMA Unisex swab collection kit
- Vaginal: APTIMA Vaginal swab collection kit

Amount to Collect:
- One swab; If C. trachomatis/N. gonorrhoeae testing also ordered, single swab may be sent for both CT/CG and Trichomonas testing

Sample Type:
- Endocervical, vaginal, male urethral

Unacceptable Conditions:
- Specimen received >60 days after collection, no swab in fluid, no fluid in tube

Specimen Preparation:
- Male urethral swabs are not tested at UCSF. Give swab to supervisor to send to Quest (test code 90801)

Reference Interval:
- Not detected

Synonyms:
- Trichomonas

Stability (from collection to initiation):
- Room temperature or refrigerated 60 days

Reported:
- 1-3 days

CPT Codes:
- 87661

LOINC Codes:
Triglycerides, Body fluid
TGF

ORDERING

Available Stat:
Yes

Performed:
24 hours per day 7 days per week

Methodology:
Spectrophotometric (glycerophosphate oxidase)

Reported:
4 hours

Additional Information:
Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

To convert mg/dL to mmol/L (SI units) multiply by 0.0113.

Increased levels of bilirubin may artifactually decrease the result.

A pleural fluid triglyceride concentration greater than 110 mg/dL or presence of chylomicrons is consistent with a diagnosis of chylothorax whereas a triglyceride level less than 50 mg/dL makes the diagnosis less likely. A ratio of pleural fluid cholesterol to triglyceride of less than 1 is also considered diagnostic (Chest. 2008 PMID: 18339791).

COLLECTION

Sample Type:
Body fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
TGF

Test Group:
Triglycerides

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Units:
mg/dL

**Additional Information:**

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

To convert mg/dL to mmol/L (SI units) multiply by 0.0113.

Increased levels of bilirubin may artifactually decrease the result.

A pleural fluid triglyceride concentration greater than 110 mg/dL or presence of chylomicrons is consistent with a diagnosis of chylothorax whereas a triglyceride level less than 50 mg/dL makes the diagnosis less likely. A ratio of pleural fluid cholesterol to triglyceride of less than 1 is also considered diagnostic (Chest. 2008 PMID: 18339791).

**ADMINISTRATIVE**

**CPT Codes:**

84432

**COMPLETE VIEW**

**Available Stat:**

Yes

**Test Code:**

TGBF

**Test Group:**

Triglycerides

**Performed:**

24 hours per day 7 days per week

**Methodology:**

Spectrophotometric (glycerophosphate oxidase)

**Collect:**

Red top or clean container

**Amount to Collect:**

5 mL fluid

**Sample Type:**

Body fluid

**Preferred Volume:**

1 mL fluid

**Minimum Volume:**

0.2 mL fluid

**Units:**

mg/dL

**Stability (from collection to initiation):**

Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

**Reported:**

4 hours

**Additional Information:**

Turbid samples, including watery stools, will be centrifuged and the test run on the supernatant.

To convert mg/dL to mmol/L (SI units) multiply by 0.0113.

Increased levels of bilirubin may artifactually decrease the result.

A pleural fluid triglyceride concentration greater than 110 mg/dL or presence of chylomicrons is consistent with a diagnosis of chylothorax whereas a triglyceride level less than 50 mg/dL makes the diagnosis less likely. A ratio of pleural fluid cholesterol to triglyceride of less than 1 is also considered diagnostic (Chest. 2008 PMID: 18339791).

**CPT Codes:**

84432
Triglycerides, serum
TRIG

ORDERING

Available Stat: No
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric (glycerophosphate oxidase)
Reported: 4 hours
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0113.
Increased levels of bilirubin may artifactually decrease the result.
Patients with levels > 1000 mg/dL (> 11.3 mmol/L) are prone to develop pancreatitis. Values above 2000 mg/dL will be phoned the same day Monday-Friday 0800-1500 or next weekday.

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: TRIG
Test Group: Triglycerides
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
mg/dL

Reference Interval:
Desirable (if fasting sample): < 150 mg/dL
Desirable (if non-fasting sample): <200 mg/dL

If non-fasting sample is 200 mg/dL or more, testing on fasting sample is recommended.

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association Guidelines, 2013

Critical Values:
None, See additional information

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.0113.

Increased levels of bilirubin may artifactually decrease the result.

Patients with levels > 1000 mg/dL (> 11.3 mmol/L) are prone to develop pancreatitis. Values above 2000 mg/dL will be phoned the same day Monday-Friday 0800-1500 or next weekday.

ADMINISTRATIVE

CPT Codes:
84478

LOINC Codes:
2571-8

COMPLETE VIEW

Available Stat:
No

Test Code:
TRIG

Test Group:
Triglycerides

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Spectrophotometric (glycerophosphate oxidase)

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Units:
mg/dL

Reference Interval:
Desirable (if fasting sample): < 150 mg/dL
Desirable (if non-fasting sample): <200 mg/dL
If non-fasting sample is 200 mg/dL or more, testing on fasting sample is recommended

Risk classifications based on combination of NCEP-ATPIII guidelines and American College of Cardiology/American Heart Association Guidelines, 2013

Critical Values:
  None, See additional information

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:
  4 hours

Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.0113.

  Increased levels of bilirubin may artifactually decrease the result.

  Patients with levels > 1000 mg/dL (> 11.3 mmol/L) are prone to develop pancreatitis. Values above 2000 mg/dL will be phoned the same day Monday-Friday 0800-1500 or next weekday.

CPT Codes:
  84478

LOINC Codes:
  2571-8
Trisomy 12 FISH
TRIS12, BTRI12

ORDERING

Available Stat:
No

Performing Lab:
Medical Genomics - Cytogenetics

Performed:
Set up daily Monday - Friday

Methodology:
Fluorescent In-situ hybridization (FISH)

Reported:
1-2 weeks

Synonyms:
• TRIS12
• BTRI12

COLLECTION

Sample Type:
Heparinized whole blood or bone marrow. Bone marrow biopsy

Collect:
Dark green top (Sodium heparin)

Amount to Collect:
See preferred volume.

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Remarks:
Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Stability (from collection to initiation):
Room temperature 2 days

Unacceptable Conditions:
Frozen, leaking or unlabeled samples

PROCESSING

Test Code:
BTRI12: Blood
TRIS12: Bone marrow

Performing Lab:
Medical Genomics - Cytogenetics

Specimen Preparation:
Keep at room temperature, do not centrifuge

Preferred Volume:
Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled samples

Stability (from collection to initiation):
- Room temperature 2 days

RESULT INTERPRETATION

Reference Interval:
- Absent

ADMINISTRATIVE

CPT Codes:
- 88271, 88275

LDT or Modified FDA:
- Yes

COMPLETE VIEW

Available Stat:
- No

Test Code:
- BTRI12: Blood
- TRIS12: Bone marrow

Performing Lab:
- Medical Genomics - Cytogenetics

Performed:
- Set up daily Monday - Friday

Methodology:
- Fluorescent In-situ hybridization (FISH)

Remarks:
- Mix blood and marrow aspirate samples well after collection. Keep at room temperature

Collect:
- Dark green top (Sodium heparin)

Amount to Collect:
- See preferred volume.

Sample Type:
- Heparinized whole blood or bone marrow. Bone marrow biopsy

Preferred Volume:
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

Minimum Volume:
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

Unacceptable Conditions:
- Frozen, leaking or unlabeled samples

Specimen Preparation:
- Keep at room temperature, do not centrifuge

Reference Interval:
Absent

**Synonyms:**
- TRIS12
- BTRI12

**Stability (from collection to initiation):**
Room temperature 2 days

**Reported:**
1-2 weeks

**CPT Codes:**
- 88271, 88275

**LDT or Modified FDA:**
Yes
Trisomy 8 FISH
TRIS8, BTRI8

ORDERING

Available Stat:
No
Performing Lab:
  Medical Genomics - Cytogenetics
Methodology:
  Fluorescent in-situ hybridization
Reported:
  7-14 days
Synonyms:
  ● +8
  ● Cytogenetic analysis
  ● Karyotype
  ● Karyotyping
  ● TRIS8
  ● BTRI8

COLLECTION

Sample Type:
  Heparinized whole blood, bone marrow, bone core
Collect:
  Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics. Dark Green top also acceptable
  Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.
Amount to Collect:
  See preferred volume.
Preferred Volume:
  Whole blood: 2 mL
  Bone marrow aspirate: 2 mL
  Bone marrow biopsy: 2 cm
Minimum Volume:
  Whole blood: 1 mL
  Bone marrow aspirate: 1 mL
  Bone marrow biopsy: 1 cm
Remarks:
  Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.
  Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.
  If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube of peripheral blood.
  Contact Hematology if the specimen is more than 24 hours old.
Stability (from collection to initiation):
  48 hours
Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**PROCESSING**

**Test Code:**
- BTR18: Blood
- TRIS8: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Specimen Preparation:**
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

**Preferred Volume:**
- Whole blood: 2 mL
- Bone marrow aspirate: 2 mL
- Bone marrow biopsy: 2 cm

**Minimum Volume:**
- Whole blood: 1 mL
- Bone marrow aspirate: 1 mL
- Bone marrow biopsy: 1 cm

**Unacceptable Conditions:**
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Stability (from collection to initiation):**
48 hours

**RESULT INTERPRETATION**

**Reference Interval:**
Not detected

**ADMINISTRATIVE**

**CPT Codes:**
88275, 88271

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
21773-7

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
- BTR18: Blood
- TRIS8: Bone marrow

**Performing Lab:**
Medical Genomics - Cytogenetics

**Methodology:**
Fluorescent in-situ hybridization

**Remarks:**
Bone marrow is the preferred specimen, but heparinized peripheral blood may be submitted if a large number of malignant cells are present.

Collect bone marrow in a syringe, transfer to Dark Green top vacutainer and gently invert the tube several times for good mixing.

If a dry tap is obtained, consult the Laboratory Medicine resident in Hematology regarding the possible submission of a green top tube.
of peripheral blood.

Contact Hematology if the specimen is more than 24 hours old.

Collect:

Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics. Dark Green top also acceptable

Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:

See preferred volume.

Sample Type:

Heparinized whole blood, bone marrow, bone core

Preferred Volume:

Whole blood: 2 mL
Bone marrow aspirate: 2 mL
Bone marrow biopsy: 2 cm

Minimum Volume:

Whole blood: 1 mL
Bone marrow aspirate: 1 mL
Bone marrow biopsy: 1 cm

Unacceptable Conditions:

Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

Specimen Preparation:

Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Reference Interval:

Not detected

Synonyms:

- +8
- Cytogenetic analysis
- Karyotype
- Karyotyping
- TRIS8
- BTRI8

Stability (from collection to initiation):

48 hours

Reported:

7-14 days

CPT Codes:

88275, 88271

LDT or Modified FDA:

Yes

LOINC Codes:

21773-7
Tropheryma whipplei PCR
WHIPP

ORDERING
Performing Lab:
  Mayo
Methodology:
  PCR
Reported:
  3-5 days
Additional Information:
  A positive result strongly suggests a diagnosis of Whipple disease.
  A negative result does not negate the presence of the organism or active disease, as false-negative results may occur due to inhibition of PCR, sequence variability underlying the primers and/or probes, or the presence of Tropheryma whipplei in quantities less than the limit of detection of the assay.
Synonyms:
  - Whipple PCR

COLLECTION
Sample Type:
  Whole blood or CSF
Collect:
  Lavender top tube or sterile container
Amount to Collect:
  1.0 mL whole blood/0.5 CSF
Preferred Volume:
  1.0 mL blood/0.5 mL CSF
Minimum Volume:
  1.0 mL blood/0.5 mL CSF
Stability (from collection to initiation):
  7 days ambient/refrigerated

PROCESSING
Test Code:
  WHIPP
Sendout:
  Yes
Performing Lab:
  Mayo
Specimen Preparation:
  Aliquot specimen (CSF) or send original tube (blood) to CB refrigerated. Order Mayo test code TWRP (for CSF) or WHIPB (for blood). Send to Mayo refrigerated (either sample type).
Preferred Volume:
  1.0 mL blood/0.5 mL CSF
Minimum Volume:
  1.0 mL blood/0.5 mL CSF
Stability (from collection to initiation):
  7 days ambient/refrigerated

RESULT INTERPRETATION
Additional Information:

A positive result strongly suggests a diagnosis of Whipple disease.

A negative result does not negate the presence of the organism or active disease, as false-negative results may occur due to inhibition of PCR, sequence variability underlying the primers and/or probes, or the presence of Tropheryma whipplei in quantities less than the limit of detection of the assay.

CPT Codes:

87798-90

LOINC Codes:

42602-3

COMPLETE VIEW

Test Code:

WHIPP

Performing Lab:

Mayo

Sendout:

Yes

Methodology:

PCR

Collect:

Lavender top tube or sterile container

Amount to Collect:

1.0 mL whole blood/0.5 CSF

Sample Type:

Whole blood or CSF

Preferred Volume:

1.0 mL blood/0.5 mL CSF

Minimum Volume:

1.0 mL blood/0.5 mL CSF

Specimen Preparation:

Aliquot specimen (CSF) or send original tube (blood) to CB refrigerated. Order Mayo test code TWRP (for CSF) or WHIPB (for blood). Send to Mayo refrigerated (either sample type).

Synonyms:

- Whipple PCR

Stability (from collection to initiation):

7 days ambient/refrigerated

Reported:

3-5 days

Additional Information:

A positive result strongly suggests a diagnosis of Whipple disease.

A negative result does not negate the presence of the organism or active disease, as false-negative results may occur due to inhibition of PCR, sequence variability underlying the primers and/or probes, or the presence of Tropheryma whipplei in quantities less than the limit of detection of the assay.

CPT Codes:

87798-90

LOINC Codes:

42602-3
Troponin I
TRPI

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Chemiluminescent immunoassay (Beckman Coulter DxI 600)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:

WARNING: Results from the Parnassus central laboratory troponin assay cannot be directly compared to results from the iSTAT point of care troponin assay performed at Mt Zion because of assay differences in standardization, normal cutoffs, and absolute values. The troponin I method used in the central laboratory at Parnassus is performed on the Beckman Coulter DxI600 platform. The 99 percentile normal cutoff for this assay in subjects between 18 - 70 years of age has been estimated to be between 0.01 and 0.04 micrograms/L (Moretti et al, Ann Clin Biochem, 2014; Gaze et al, Clinical Chemistry, abstract B354, page S262, 2014). Testing of 28 male and 29 female healthy lab volunteers at UCSF showed all results were <0.05 micrograms/L except for one subject and > 90% were below the assay limit of detection of 0.02 micrograms/L. Based on these observations, troponin I results that exceed 0.04 micrograms/L in this assay are flagged as abnormal.

The coefficient of variation of the Beckman Coulter DxI assay at a level of 0.03 micrograms/L is ~ 10% which has been confirmed by in house testing. When following patients with troponin levels of < 0.25 micrograms/L, one can be confident (> 95%) that a change in results greater than ~0.02 micrograms/L is clinically real and not likely due to inherent variability in the assay (assuming use of fresh plasma samples without residual fibrin strands or interfering material). Changes of 0.01 - 0.02 micrograms/L could represent inherent assay variability or be clinically real. When following a patient with a troponin level of 0.25 micrograms/L or more, one can be confident that a change in results of greater than 10% is clinically real and not likely due to assay variability (Clinica Chimica Acta 413:1786-1791, 2012). In a patient with a troponin level of 0.25 micrograms/L or more, a change in results of 1% - 10% could represent inherent assay variability or be clinically real.

This assay is not considered a high sensitivity troponin assay and is not capable of measuring the extremely low levels of troponin that circulate in most normal subjects. Serial sampling is recommended to help guide interpretation of troponin results and detect the temporal rise and fall of troponin levels characteristic of acute cardiac injury. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. Questionable results should be checked by repeating the assay after the sample has been carefully examined or respun as necessary to insure absence of possible fibrin strains or particulate material that could interfere in the assay. Repeat testing with a different troponin assay may be useful in cases where interference by heterophile antibodies or other immunoglobulins is suspected.

Troponin I is believed to be predominantly cleared by non-renal mechanisms and increased troponin I levels in renal failure patients may signify underlying cardiac damage (Ann Clin Biochem 2007; 44: 285-289). Renal failure patients with increased troponin I levels have been reported to be at greater cardiovascular risk than those with normal levels of troponin I (Ann Clin Biochem 2007; 44: 285-289).

Note: Spurious increases in troponin I can occur in samples that contain microclots/fibrin strands. Collection of a heparinized blood specimen is recommended to minimize the chance of microcot formation. Heterophile antibodies or other abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.

COLLECTION

Sample Type:
Heparinized plasma or serum
Collect:
  Light Green top preferred; Red top or Gold top acceptable

  **Note:** Plasma and serum samples should not be used interchangeably in the same patient

Amount to Collect:
  2 mL blood

Preferred Volume:
  1 mL plasma or serum

Minimum Volume:
  0.5 mL plasma or serum

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 3 days hours, frozen 1 month

**PROCESSING**

Test Code:
  TRPI

Test Group:
  Troponin

Performing Lab:
  Parnassus & Mission Bay Chemistry

Specimen Preparation:
  Refrigerate plasma or serum

Preferred Volume:
  1 mL plasma or serum

Minimum Volume:
  0.5 mL plasma or serum

Stability (from collection to initiation):
  Room temperature 8 hours, refrigerated 3 days hours, frozen 1 month

**RESULT INTERPRETATION**

Units:
  µg/L

Reference Interval:
  <0.05 µg/L

Critical Values:
  >= 0.05 µg/L.

  Note: The first elevated troponin for a patient will be called. Subsequent elevated Troponin levels for the same patient in the next 72 hours after the initial report will not be called.

Additional Information:
  **WARNING:** Results from the Parnassus central laboratory troponin assay cannot be directly compared to results from the iSTAT point of care troponin assay performed at Mt Zion because of assay differences in standardization, normal cutoffs, and absolute values.

  The troponin I method used in the central laboratory at Parnassus is performed on the Beckman Coulter DxI600 platform. The 99 percentile normal cutoff for this assay in subjects between 18 - 70 years of age has been estimated to be between 0.01 and 0.04 micrograms/L (Moretti et al, Ann Clin Biochem, 2014; Gaze et al, Clinical Chemistry, abstract B354, page S262, 2014). Testing of 28 male and 29 female healthy lab volunteers at UCSF showed all results were <0.05 micrograms/L except for one subject and > 90% were below the assay limit of detection of 0.02 micrograms/L. Based on these observations, troponin I results that exceed 0.04 micrograms/L in this assay are flagged as abnormal.

  The coefficient of variation of the Beckman Coulter DxI assay at a level of 0.03 micrograms/L is ~ 10% which has been confirmed by in house testing. When following patients with troponin levels of < 0.25 micrograms/L, one can be confident (> 95%) that a change in results greater than ~0.02 micrograms/L is clinically real and not likely due to inherent variability in the assay (assuming use of fresh plasma samples without residual fibrin strands or interfering material). Changes of 0.01 - 0.02 micrograms/L could represent inherent assay variability or be clinically real. When following a patient with a troponin level of 0.25 micrograms/L or more, one can be confident that a change in results of greater than 10% is clinically real and not likely due to assay variability (Clinica Chimica Acta 413:1786-1791,
In a patient with a troponin level of 0.25 micrograms/L or more, a change in results of 1% - 10% could represent inherent assay variability or be clinically real.

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Troponin I is believed to be predominantly cleared by non-renal mechanisms and increased troponin I levels in renal failure patients may signify underlying cardiac damage (Ann Clin Biochem 2007; 44: 285-289). Renal failure patients with increased troponin I levels have been reported to be at greater cardiovascular risk than those with normal levels of troponin I (Ann Clin Biochem 2007; 44: 285-289).

Note: Spurious increases in troponin I can occur in samples that contain microclots/fibrin strands. Collection of a heparinized blood specimen is recommended to minimize the chance of microclot formation. Heterophile antibodies or other abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.

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**ADMINISTRATIVE**

| CPT Codes: | 84484 |
| LOINC Codes: | 42757-5 |

**COMPLETE VIEW**

| Available Stat: | Yes |
| Test Code: | TRPI |
| Test Group: | Troponin |
| Performing Lab: | Parnassus & Mission Bay Chemistry |
| Performed: | Test available 24 hours per day 7 days per week |
| Methodology: | Chemiluminescent immunoassay (Beckman Coulter Dxl 600) |
| Collect: | Light Green top preferred; Red top or Gold top acceptable |

**Note:** Plasma and serum samples should not be used interchangeably in the same patient

| Amount to Collect: | 2 mL blood |
| Sample Type: | Heparinized plasma or serum |
| Preferred Volume: | 1 mL plasma or serum |
| Minimum Volume: | 0.5 mL plasma or serum |

**Specimen Preparation:**

Refrigerate plasma or serum
Units:
µg/L

Reference Interval:
<0.05 µg/L

Critical Values:
>= 0.05 µg/L.

Note: The first elevated troponin for a patient will be called. Subsequent elevated Troponin levels for the same patient in the next 72 hours after the initial report will not be called.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 3 days hours, frozen 1 month

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
WARNING: Results from the Parnassus central laboratory troponin assay cannot be directly compared to results from the iSTAT point of care troponin assay performed at Mt Zion because of assay differences in standardization, normal cutoffs, and absolute values.

The troponin I method used in the central laboratory at Parnassus is performed on the Beckman Coulter DxI600 platform. The 99 percentile normal cutoff for this assay in subjects between 18 - 70 years of age has been estimated to be between 0.01 and 0.04 micrograms/L (Moretti et al, Ann Clin Biochem, 2014; Gaze et al, Clinical Chemistry, abstract B354, page S262, 2014). Testing of 28 male and 29 female healthy lab volunteers at UCSF showed all results were <0.05 micrograms/L except for one subject and > 90% were below the assay limit of detection of 0.02 micrograms/L. Based on these observations, troponin I results that exceed 0.04 micrograms/L in this assay are flagged as abnormal.

The coefficient of variation of the Beckman Coulter DxI assay at a level of 0.03 micrograms/L is ~ 10% which has been confirmed by in house testing. When following patients with troponin levels of < 0.25 micrograms/L, one can be confident (> 95%) that a change in results greater than ~0.02 micrograms/L is clinically real and not likely due to inherent variability in the assay (assuming use of fresh plasma samples without residual fibrin strands or interfering material). Changes of 0.01 - 0.02 micrograms/L could represent inherent assay variability or be clinically real. When following a patient with a troponin level of 0.25 micrograms/L or more, one can be confident that a change in results of greater than 10% is clinically real and not likely due to assay variability (Clinica Chimica Acta 413:1786-1791, 2012). In a patient with a troponin level of 0.25 micrograms/L or more, a change in results of 1% - 10% could represent inherent assay variability or be clinically real.

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Troponin I is believed to be predominantly cleared by non-renal mechanisms and increased troponin I levels in renal failure patients may signify underlying cardiac damage (Ann Clin Biochem 2007; 44: 285-289). Renal failure patients with increased troponin I levels have been reported to be at greater cardiovascular risk than those with normal levels of troponin I (Ann Clin Biochem 2007; 44: 285-289).

Note: Spurious increases in troponin I can occur in samples that contain microclots/fibrin strands. Collection of a heparinized blood specimen is recommended to minimize the chance of microclot formation. Heterophile antibodies or other abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.

CPT Codes:
84484

LOINC Codes:
42757-5
Troponin I at Mount Zion

ORDERING

Available Stat: Yes
Performing Lab: Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: iStat two-site Enzyme linked immunosorbent assay
Reported: 1 hour

Additional Information:

WARNING: Results for the iSTAT troponin test performed at Mt. Zion cannot be directly compared to results for troponin tests performed in the central laboratory at Parnassus because of assay differences in standardization, normal cutoffs, and absolute values.

The Joint European Society of Cardiology/American College of Cardiology Committee (ESC/ACC) consensus guidelines for diagnosis of MI include observation of the typical rise and fall of cardiac markers with at least one of: ischemic symptoms, development of pathologic Q waves on electrocardiogram (ECG), ST segment elevation or depression in ECG, or coronary artery intervention (1); troponin is the preferred marker with a cutoff set at or above the 99th percentile of a healthy population. The troponin I assay used at Mt. Zion is manufactured by Abbott Laboratories (iSTAT troponin assay) and has a 99th percentile cutoff in normals of < 0.09 micrograms/L. All troponin I results that exceed 0.08 µg/L in this assay are flagged as abnormal. The coefficient of variation of this assay at the 99th percentile is 15 -25% as determined by the manufacturer and in house testing (Pathology 42:402-408, 2010). The coefficient of variation at a level around 0.15 to 0.2 micrograms/L is approximately 10%. This assay is not considered a high sensitivity troponin assay.

Serial sampling is strongly recommended to help guide interpretation of troponin results and detect the temporal rise and fall of troponin levels characteristic of acute cardiac injury. When following patients with troponin levels of < 0.25 in either the iSTAT or Parnassus central lab assays, one can be confident (95%) that a change in results of ~0.05 units or more is clinically real and not due to inherent variability in the assay. Changes less than ~ 0.05 units could represent inherent assay variability or be clinically real. When following patients with troponin levels of 0.25 or more, a change in results of 20-30% or more is clinically real and not likely due to assay variability. In patients with troponin levels of 0.25 or greater, a change in results of less than 20-30% could represent inherent assay variability or be clinically real.

The iSTAT point of care assay used at Mount Zion is not as sensitive as the Parnassus central lab troponin assay for detecting small elevations in troponin above the respective 99th percentile normal cutoffs of each assay.

The iSTAT assay tends to miss borderline, low level troponin elevations based on the 99th percentile cutoffs. A negative iSTAT result in a sample with a positive central lab troponin result at Parnassus is primarily observed in cases where the Parnassus central lab troponin value is borderline/slightly elevated (in the range of 0.05 - 0.10).

The iSTAT assay will be positive in 90% of cases where the troponin is > 0.10 in the Parnassus central lab assay. A sample positive by iSTAT will almost always (97-99%) be positive by the Parnassus central lab assay. In the occasional sample where an iSTAT result is positive and the Parnassus central lab result is negative, the iSTAT result is usually only borderline elevated. It is unknown whether these cases represent false positive results by iSTAT or false negative results by the Parnassus central lab assay.

Note: Troponin I values above the 99th percentile normal limit can occur due to many different causes of cardiac injury, not just acute coronary syndromes. In addition, > 90% of patients who have undergone radio-frequency ablation of an arrhythmogenic focus may exhibit an increase in troponin levels. In contrast to CK-MB which can be increased by skeletal trauma including the transection of muscle tissue during surgery, release of troponin I from non-cardiac sources has not been reported.

Spurious increases in troponin I can occur in samples that contain microclots. Collection of a heparinized blood specimen is recommended to minimize the chance of microclot formation. Heterophile antibodies or abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Anti-E.coli antibodies may also cause anomalous results. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.
**COLLECTION**

**Sample Type:**
- Heparinized whole blood

**Collect:**
- Light green top or Dark green top filled to full extent of vacuum

**Amount to Collect:**
- Full Light green or Dark green vacutainer tube

**Preferred Volume:**
- Full Light green or Dark green vacutainer tube

**Minimum Volume:**
- Full Light green or Dark green vacutainer tube

**Remarks:**
- Due to the sample stability limits of this assay (30 min), samples should be delivered directly to the testing section of the Mt Zion clinical laboratory within 10 minutes of collection.

**Stability (from collection to initiation):**
- 30 minutes

**Unacceptable Conditions:**
- Clotted sample. Sample > 30 minutes old when received. Vacutainer not completely filled

**PROCESSING**

**Test Code:**
- TRIPOC

**Test Group:**
- Troponin

**Performing Lab:**
- Mt. Zion Chemistry

**Specimen Preparation:**
- Deliver immediately to lab section for testing

**Preferred Volume:**
- Full Light green or Dark green vacutainer tube

**Minimum Volume:**
- Full Light green or Dark green vacutainer tube

**Unacceptable Conditions:**
- Clotted sample. Sample > 30 minutes old when received. Vacutainer not completely filled

**Stability (from collection to initiation):**
- 30 minutes

**RESULT INTERPRETATION**

**Units:**
- µg/L

**Reference Interval:**
- <0.09 µg/L

**Critical Values:**
- > 0.08 µg/L

**Additional Information:**
- **WARNING:** Results for the iSTAT troponin test performed at Mt Zion cannot be directly compared to results for troponin tests performed in the central laboratory at Parnassus because of assay differences in standardization, normal cutoffs, and absolute values.

The Joint European Society of Cardiology/American College of Cardiology Committee (ESC/ACC) consensus guidelines for diagnosis of MI include observation of the typical rise and fall of cardiac markers with at least one of: ischemic symptoms, development of pathologic Q waves on electrocardiogram (ECG), ST segment elevation or depression in ECG, or coronary artery intervention (1); troponin is the preferred marker with a cutoff set at or above the 99th percentile of a healthy population. The troponin I assay used at Mt. Zion is...
manufactured by Abbott Laboratories (iSTAT troponin assay) and has a 99th percentile cutoff in normals of < 0.09 micrograms/L. All troponin I results that exceed 0.08 µg/L in this assay are flagged as abnormal. The coefficient of variation of this assay at the 99th percentile is 15 -25% as determined by the manufacturer and in house testing (Pathology 42:402-408, 2010). The coefficient of variation at a level around 0.15 to 0.2 micrograms/L is approximately 10%. This assay is not considered a high sensitivity troponin assay.

Serial sampling is strongly recommended to help guide interpretation of troponin results and detect the temporal rise and fall of troponin levels characteristic of acute cardiac injury. When following patients with troponin levels of < 0.25 in either the iSTAT or Parnassus central lab assays, one can be confident (95%) that a change in results of ~0.05 units or more is clinically real and not due to inherent variability in the assay. Changes less than ~ 0.05 units could represent inherent assay variability or be clinically real. When following patients with troponin levels of 0.25 or more, one can be confident that a change in results of 20-30% or more is clinically real and not likely due to assay variability. In patients with troponin levels of 0.25 or greater, a change in results of less than 20-30% could represent inherent assay variability or be clinically real.

The iSTAT point of care assay used at Mount Zion is not as sensitive as the Parnassus central lab troponin assay for detecting small elevations in troponin above the respective 99%ile normal cutoffs of each assay.

The iSTAT assay tends to miss borderline, low level troponin elevations based on the 99%ile cutoffs. A negative iSTAT result in a sample with a positive central lab troponin result at Parnassus is primarily observed in cases where the Parnassus central lab troponin value is borderline/slightly elevated (in the range of 0.05 - 0.10).

The iSTAT assay will be positive in 90% of cases where the troponin is > 0.10 in the Parnassus central lab assay. A sample positive by iSTAT will almost always (97-99%) be positive by the Parnassus central lab assay. In the occasional sample where an iSTAT result is positive and the Parnassus central lab result is negative, the iSTAT result is usually only borderline elevated. It is unknown whether these cases represent false positive results by iSTAT or false negative results by the Parnassus central lab assay.

Note: Troponin I values above the 99th percentile normal limit can occur due to many different causes of cardiac injury, not just acute coronary syndromes. In addition, > 90% of patients who have undergone radio-frequency ablation of an arrhythmogenic focus may exhibit an increase in troponin levels. In contrast to CK-MB which can be increased by skeletal trauma including the transection of muscle tissue during surgery, release of troponin I from non-cardiac sources has not been reported.

Spurious increases in troponin I can occur in samples that contain microclots. Collection of a heparinized blood specimen is recommended to minimize the chance of microclot formation. Heterophile antibodies or abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Anti-E.coli antibodies may also cause anomalous results. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.

**ADMINISTRATIVE**

CPT Codes:

84484

**COMPLETE VIEW**

Available Stat: Yes
Test Code: TRIPOC
Test Group: Troponin
Performing Lab: Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: iStat two-site Enzyme linked immunosorbent assay
Remarks: Due to the sample stability limits of this assay (30 min), samples should be delivered directly to the testing section of the Mt Zion clinical laboratory within 10 minutes of collection.
Collect:
  Light green top or Dark green top filled to full extent of vacuum

Amount to Collect:
  Full Light green or Dark green vacutainer tube

Sample Type:
  Heparinized whole blood

Preferred Volume:
  Full Light green or Dark green vacutainer tube

Minimum Volume:
  Full Light green or Dark green vacutainer tube

Unacceptable Conditions:
  Clotted sample. Sample > 30 minutes old when received. Vacutainer not completely filled

Specimen Preparation:
  Deliver immediately to lab section for testing

Units:
  µg/L

Reference Interval:
  <0.09 µg/L

Critical Values:
  > 0.08 µg/L

Stability (from collection to initiation):
  30 minutes

Reported:
  1 hour

Additional Information:

WARNING: Results for the iSTAT troponin test performed at Mt Zion cannot be directly compared to results for troponin tests performed in the central laboratory at Parnassus because of assay differences in standardization, normal cutoffs, and absolute values.

The Joint European Society of Cardiology/American College of Cardiology Committee (ESC/ACC) consensus guidelines for diagnosis of MI include observation of the typical rise and fall of cardiac markers with at least one of: ischemic symptoms, development of pathologic Q waves on electrocardiogram (ECG), ST segment elevation or depression in ECG, or coronary artery intervention (1); troponin is the preferred marker with a cutoff set at or above the 99th percentile of a healthy population. The troponin I assay used at Mt. Zion is manufactured by Abbott Laboratories (iSTAT troponin assay) and has a 99th percentile cutoff in normals of < 0.09 micrograms/L. All troponin I results that exceed 0.08 µg/L in this assay are flagged as abnormal. The coefficient of variation of this assay at the 99th percentile is 15 -25% as determined by the manufacturer and in house testing (Pathology 42:402-408, 2010). The coefficient of variation at a level around 0.15 to 0.2 micrograms/L is approximately 10%. This assay is not considered a high sensitivity troponin assay.

Serial sampling is strongly recommended to help guide interpretation of troponin results and detect the temporal rise and fall of troponin levels characteristic of acute cardiac injury. When following patients with troponin levels of < 0.25 in either the iSTAT or Parnassus central lab assays, one can be confident (95%) that a change in results of ~0.05 units or more is clinically real and not due to inherent variability in the assay. Changes less than ~ 0.05 units could represent inherent assay variability or be clinically real. When following patients with troponin levels of 0.25 or more, one can be confident that a change in results of 20-30% or more is clinically real and not likely due to assay variability. In patients with troponin levels of 0.25 or greater, a change in results of less than 20-30% could represent inherent assay variability or be clinically real.

The iSTAT point of care assay used at Mount Zion is not as sensitive as the Parnassus central lab troponin assay for detecting small elevations in troponin above the respective 99%ile normal cutoffs of each assay.

The iSTAT assay tends to miss borderline, low level troponin elevations based on the 99%ile cutoffs. A negative iSTAT result in a sample with a positive central lab troponin result at Parnassus is primarily observed in cases where the Parnassus central lab troponin value is borderline/slightly elevated (in the range of 0.05 - 0.10).

The iSTAT assay will be positive in 90% of cases where the troponin is > 0.10 in the Parnassus central lab assay. A sample positive by iSTAT will almost always (97-99%) be positive by the Parnassus central lab assay. In the occasional sample where an iSTAT result is positive and the Parnassus central lab result is negative, the iSTAT result is usually only borderline elevated. It is unknown whether these cases represent false positive results by iSTAT or false negative results by the Parnassus central lab assay.

Note: Troponin I values above the 99th percentile normal limit can occur due to many different causes of cardiac injury, not just acute coronary syndromes. In addition, > 90% of patients who have undergone radio-frequency ablation of an arrhythmogenic focus may
exhibit an increase in troponin levels. In contrast to CK-MB which can be increased by skeletal trauma including the transection of muscle tissue during surgery, release of troponin I from non-cardiac sources has not been reported.

Spurious increases in troponin I can occur in samples that contain microclots. Collection of a heparinized blood specimen is recommended to minimize the chance of micro clot formation. Heterophile antibodies or abnormal immunoglobulins may cause falsely increased or falsely decreased results; falsely low results may occur in patients with autoantibodies against cardiac troponins. Anti-E.coli antibodies may also cause anomalous results. Technical artifacts should be suspected in patients in whom an increased troponin level abruptly falls to normal much more quickly than would be expected, or in whom serial troponin levels are chronically elevated. If a spurious result is suspected, the laboratory can be notified to repeat the result using the same assay and/or a different troponin assay for confirmatory purposes.

CPT Codes:
84484
Trypanosoma cruzi Antibodies (IgG & IgM)
TCAB

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Focus via Quest

**Methodology:**
Immunoassay

**Reported:**
Set up 5x per week. Turnaround 3-7 days.

**Additional Information:**
Cross-reactions may occur with other parasites, particularly Leishmania. Tests become positive 3 weeks to 3 months after infection, reach maximum titers at 3-4 months after infection, and can remain positive at low titers for life.

**Synonyms:**
- Chagas

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Red top or Gold top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Stability (from collection to initiation):**
Room temperature 7 days, refrigerated 2 weeks, frozen at -20°C 1 month.

**PROCESSING**

**Test Code:**
TCAB

**Test Group:**
Trypanosoma

**Sendout:**
Yes

**Performing Lab:**
Focus via Quest

**Specimen Preparation:**
Spin and freeze aliquot at -20°C. Send to China Basin.

**Preferred Volume:**
0.5 mL serum

**Minimum Volume:**
0.2 mL serum

**Stability (from collection to initiation):**
Room temperature 7 days, refrigerated 2 weeks, frozen at -20°C 1 month.
RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
Cross-reactions may occur with other parasites, particularly Leishmania. Tests become positive 3 weeks to 3 months after infection, reach maximum titers at 3-4 months after infection, and can remain positive at low titers for life.

ADMINISTRATIVE

CPT Codes:
86753-90 x2

COMPLETE VIEW

Available Stat:
No

Test Code:
TCAB

Test Group:
Trypanosoma

Performing Lab:
Focus via Quest

Sendout:
Yes

Methodology:
Imunoassay

Collect:
Red top or Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Specimen Preparation:
Spin and freeze aliquot at -20C. Send to China Basin.

Reference Interval:
Negative

Synonyms:
- Chagas

Stability (from collection to initiation):
Room temperature 7 days, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
Set up 5x per week. Turnaround 3-7 days.

Additional Information:
Cross-reactions may occur with other parasites, particularly Leishmania. Tests become positive 3 weeks to 3 months after infection, reach maximum titers at 3-4 months after infection, and can remain positive at low titers for life.

CPT Codes:
86753-90 x2
Trypanosome Exam
P409

ORDERING

Approval Required:
No, but contact parasitologist in Microbiology (x31268) prior to specimen collection

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Monday-Thursday before 12:30 pm

Methodology:
Microscopy (Giemsa stain of thick and thin smears)

Reported:
1-3 days

Additional Information:
This test is offered for the causitive agent of Chagas disease. Sensitivity of direct smear is limited to severe acute stage, reactivation, or detection in recipients of organs from donors with chronic Chagas disease.

Physician may also request Microbiology to send sample to CDC for T. cruzi PCR

For African trypanosomiasis (sleeping sickness), thick and thin smears of blood, CSF, or aspirates of lymph node and trypanosomal chancres can be examined.

CDC offers clinical consultation, but not testing, for suspect African trypanosomiasis.

Synonyms:
- Trypanosoma cruzi, Chagas disease

COLLECTION

Sample Type:
EDTA whole blood, CSF
Heart biopsy in sterile saline or FFPE

Collect:
Blood: Lavender or Dark Green top
CSF: CSF tube or sterile collection tube
Heart biopsy for CDC PCR Testing: Sterile collection tube with saline or FFPE material

Amount to Collect:
See preferred volume.

Preferred Volume:
Blood: 3 mL
CSF: 1 mL
Heart biopsy for CDC PCR Testing: 3 cubic mm (fresh or from FFPE material)

Minimum Volume:
Blood (Adult): 2.5 mL
Blood (Pediatric): 0.5 mL
CSF: 0.5 mL
Heart biopsy for CDC PCR Testing: 2.5 cubic mm (fresh or from FFPE material)

Remarks:
Collect blood prior to anti-parasitic therapy.

Contact parasitologist in Microbiology (x31268) prior to collection to discuss appropriate sample type and collection instructions.

Collect and deliver the specimen directly to the laboratory within 30 minutes of collection Monday-Thursday before 12:30 pm.
Include travel/residence history on requisition.

**Stability (from collection to initiation):**
Refrigerated 24 hours

### PROCESSING

**Test Code:**
- P409

**Test Group:**
- Trypanosoma

**Sendout:**
Physician may also request Microbiology to send sample to CDC for T. cruzi PCR

**Performing Lab:**
Microbiology

**Specimen Preparation:**
Store samples in refrigerator. Send to Microbiology refrigerated

For PCR to CDC: Ship Monday-Thursday, overnight to avoid weekend deliveries. Ship sample on cold packs, except ship paraffin embedded tissue at ambient temperature.

Request provider to complete page 2 of CDC Specimen Submission Form 50.34, which is available at http://www.cdc.gov/laboratory/specimen-submission/form.html

**Preferred Volume:**
- Blood: 3 mL
- CSF: 1 mL
- Heart biopsy for CDC PCR Testing: 3 cubic mm (fresh or from FFPE material)

**Minimum Volume:**
- Blood (Adult): 2.5 mL
- Blood (Pediatric): 0.5 mL
- CSF: 0.5 mL
- Heart biopsy for CDC PCR Testing: 2.5 cubic mm (fresh or from FFPE material)

**Stability (from collection to initiation):**
Refrigerated 24 hours

### RESULT INTERPRETATION

**Reference Interval:**
No Trypanosoma species seen/detected

**Critical Values:**
Positive result from normally sterile sites

**Additional Information:**
This test is offered for the causitive agent of Chagas disease. Sensitivity of direct smear is limited to severe acute stage, reactivation, or detection in recipients of organs from donors with chronic Chagas disease.

Physician may also request Microbiology to send sample to CDC for T. cruzi PCR

For African trypanosomiasis (sleeping sickness), thick and thin smears of blood, CSF, or aspirates of lymph node and trypanosomal chancres can be examined.

CDC offers clinical consultation, but not testing, for suspect African trypanosomiasis.

### ADMINISTRATIVE

**CPT Codes:**
- 87207

**COMPLETE VIEW**

Printed 06/07/19
Test information subject to change
Approval Required:
   No, but contact parasitologist in Microbiology (x31268) prior to specimen collection

Available Stat:
   No

Test Code:
   P409

Test Group:
   Trypanosoma

Performing Lab:
   Microbiology

Sendout:
   Physician may also request Microbiology to send sample to CDC for T. cruzi PCR

Performed:
   Monday-Thursday before 12:30 pm

Methodology:
   Microscopy (Giema stain of thick and thin smears)

Remarks:
   Collect blood prior to anti-parasitic therapy.

   Contact parasitologist in Microbiology (x31268) prior to collection to discuss appropriate sample type and collection instructions.

   Collect and deliver the specimen directly to the laboratory within 30 minutes of collection Monday-Thursday before 12:30 pm.

   Include travel/residence history on requisition.

Collect:
   Blood: Lavender or Dark Green top
   CSF: CSF tube or sterile collection tube
   Heart biopsy for CDC PCR Testing: Sterile collection tube with saline or FFPE material

Amount to Collect:
   See preferred volume.

Sample Type:
   EDTA whole blood, CSF
   Heart biopsy in sterile saline or FFPE

Preferred Volume:
   Blood: 3 mL
   CSF: 1 mL
   Heart biopsy for CDC PCR Testing: 3 cubic mm (fresh or from FFPE material)

Minimum Volume:
   Blood (Adult): 2.5 mL
   Blood (Pediatric): 0.5 mL
   CSF: 0.5 mL
   Heart biopsy for CDC PCR Testing: 2.5 cubic mm (fresh or from FFPE material)

Specimen Preparation:
   Store samples in refrigerator. Send to Microbiology refrigerated

   For PCR to CDC: Ship Monday-Thursday, overnight to avoid weekend deliveries. Ship sample on cold packs, except ship paraffin embedded tissue at ambient temperature.

   Request provider to complete page 2 of CDC Specimen Submission Form 50.34, which is available at http://www.cdc.gov/laboratory/specimen-submission/form.html

Reference Interval:
   No Trypanosoma species seen/detected

Critical Values:
   Positive result from normally sterile sites

Synonyms:
   • Trypanosoma cruzi, Chagas disease

Stability (from collection to initiation):

Refrigerated 24 hours

**Reported:**
1-3 days

**Additional Information:**
This test is offered for the causitive agent of Chagas disease. Sensitivity of direct smear is limited to severe acute stage, reactivation, or detection in recipients of organs from donors with chronic Chagas disease.

Physician may also request Microbiology to send sample to CDC for T. cruzi PCR

For African trypanosomiasis (sleeping sickness), thick and thin smears of blood, CSF, or aspirates of lymph node and trypanosomal chancres can be examined.

CDC offers clinical consultation, but not testing, for suspect African trypanosomiasis.

**CPT Codes:**
87207
Tularemia Agglutinins
TULA

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: Direct Agglutination
Reported: Test performed daily. Turnaround time: 3-5 days.
Additional Information: Tularemia antibody titers >= 1:20 are of diagnostic significance. However, titers in this range may also indicate previous infection. Antibody begins to appear 2-3 weeks post-onset and generally peaks at approximately 5 weeks into the disease. Based on the antibody production pattern, a second specimen will usually demonstrate a diagnostic four fold rise for patients with active disease.
Synonyms:
- Francisella
- Tularemia antibodies

COLLECTION

Sample Type: Serum
Collect: Red top (Gold top acceptable)
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: TULA
Sendout: Yes
Performing Lab: Focus via Quest
Specimen Preparation: Freeze sample at -20C. Order Quest # 35176X
Preferred Volume: 1 mL serum
Minimum Volume: 0.5 mL serum
Stability (from collection to initiation): Refrigerated 2 days, frozen at -20C 1 week
RESULT INTERPRETATION

Units:
- Titer

Reference Interval:
- Negative titer < 20
- Equivocal titer 20-80
- Positive titer > 80

Additional Information:
- Tularemia antibody titers >= 1:20 are of diagnostic significance. However, titers in this range may also indicate previous infection.
- Antibody begins to appear 2-3 weeks post-onset and generally peaks at approximately 5 weeks into the disease. Based on the antibody production pattern, a second specimen will usually demonstrate a diagnostic four fold rise for patients with active disease.

ADMINISTRATIVE

CPT Codes:
- 86000-90

LOINC Codes:
- 23125-8

COMPLETE VIEW

Available Stat:
- No

Test Code:
- TULA

Performing Lab:
- Focus via Quest

Sendout:
- Yes

Methodology:
- Direct Agglutination

Collect:
- Red top (Gold top acceptable)

Amount to Collect:
- 2 mL blood

Sample Type:
- Serum

Preferred Volume:
- 1 mL serum

Minimum Volume:
- 0.5 mL serum

Specimen Preparation:
- Freeze sample at -20C. Order Quest # 35176X

Units:
- Titer

Reference Interval:
- Negative titer < 20
- Equivocal titer 20-80
- Positive titer > 80

Synonyms:
- Francisella
- Tularemia antibodies

Stability (from collection to initiation):
- Refrigerated 2 days, frozen at -20C 1 week

Reported:
- Test performed daily. Turnaround time: 3-5 days.

Additional Information:

Printed 06/07/19
Test information subject to change
Tularemia antibody titers $\geq$ 1:20 are of diagnostic significance. However, titers in this range may also indicate previous infection. Antibody begins to appear 2-3 weeks post-onset and generally peaks at approximately 5 weeks into the disease. Based on the antibody production pattern, a second specimen will usually demonstrate a diagnostic four fold rise for patients with active disease.

CPT Codes:
86000-90

LOINC Codes:
23125-8
Type and Screen
TYSC

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Blood Banks
Performed: Test available 24 hours per day 7 days per week
Reported: STAT 1 hour, ASAP 2 hours, Routine 4 hours

Additional Information:
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.
RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Caucasian</th>
<th>African-American</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>15</td>
<td>8</td>
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<td>C</td>
<td>32</td>
<td>73</td>
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<td>7</td>
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</tbody>
</table>

see also: ABO, Rh, and Antibody Screen.


Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

Synonyms:
- Prenatal screening

COLLECTION

Sample Type: EDTA whole blood
Collect: Lavender top (6 mL size preferred)
Amount to Collect: See info for Preferred and Minimum sample volumes
Preferred Volume:
- Patient Age EDTA (Purple top) Volume
  - <4 mo Full Microtainer (0.8 mL)
  - 4 mo - 1 year 3 mL
  - 1-18 years 3-6 mL (3 mL OK for small children)
  - >18 years 6 mL
Minimum Volume:
Patient Age  EDTA (Purple top) Volume
<4 mo   Full Microtainer (0.8 mL)
4 mo-1 year  1 mL
1-18 years  3 mL
>18 years  5 mL

Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

PROCESSING

Test Code:
TYSC
Performing Lab:
Parnassus & Mission Bay Blood Banks
Preferred Volume:

<table>
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<tr>
<th>Patient Age</th>
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<tr>
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<tr>
<td>&gt;18 years</td>
<td>6 mL</td>
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Minimum Volume:

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Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.
RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

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<td>c</td>
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<td>E</td>
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see also: ABO, Rh, and Antibody Screen.
CPT Codes:
86900, 86901, 86850

COMPLETE VIEW

Available Stat:
Yes

Test Code:
TYSC

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test available 24 hours per day 7 days per week

Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
See info for Preferred and Minimum sample volumes

Sample Type:
EDTA whole blood

Preferred Volume:

<table>
<thead>
<tr>
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<td>&lt;4 mo</td>
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Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

Synonym:
- Prenatal screening

Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

Additional Information:
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

<table>
<thead>
<tr>
<th>RBC antigen</th>
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see also: ABO, Rh, and Antibody Screen.

CPT Codes:

86900, 86901, 86850
Type and Screen, Non-patient
TSNP

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus & Mission Bay Blood Banks

Performed:
Test available 24 hours per day 7 days per week

Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Additional Information:
Test is for use in neonatal transfusion only.

Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

See also: ABO, Rh, and Antibody Screen.

RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

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Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

COLLECTION

Sample Type:
EDTA whole blood

Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Remarks:
Use BLOOD BANK requisition

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.
PROCESSING

Test Code:  
TSNP
Performing Lab:  
Parnassus & Mission Bay Blood Banks
Preferred Volume:  
6 mL blood
Minimum Volume:  
2 mL blood
Unacceptable Conditions:  
Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:  
Test is for use in neonatal transfusion only.
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.
See also: ABO, Rh, and Antibody Screen.
RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)
D  15  8
C  32  73
c  20  4
E  71  78
e  2  2
K  91  98
Jka  23  8
Jkb  26  51
Fya  34  90
Fyb  17  77
S  45  69
s  11  7


ADMINISTRATIVE

CPT Codes:
86900, 86901, 86850

COMPLETE VIEW

Available Stat:  
Yes
Test Code:  
TSNP
Performing Lab:  
Parnassus & Mission Bay Blood Banks
Performed:  
Test available 24 hours per day 7 days per week
Remarks:  
Use BLOOD BANK requisition
Collect:
Lavender top (6 mL size preferred)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

 Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

Additional Information:
Test is for use in neonatal transfusion only.

Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

See also: ABO, Rh, and Antibody Screen.

<table>
<thead>
<tr>
<th>RBC antigen</th>
<th>% of antigen negative (Caucasian)</th>
<th>% of antigen negative (African-American)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>15</td>
<td>8</td>
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<tr>
<td>C</td>
<td>32</td>
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<td>s</td>
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<td>7</td>
</tr>
</tbody>
</table>


CPT Codes:
86900, 86901, 86850
Type and Screen, Prenatal
ABPR

ORDERING

Available Stat:
Yes
Performing Lab:
Parnassus & Mission Bay Blood Banks
Performed:
Test available 24 hours per day 7 days per week
Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours
Additional Information:
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

See also: ABO, Rh, and Antibody Screen.

RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

<table>
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<tr>
<th>Antigen</th>
<th>Caucasian</th>
<th>African-American</th>
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<tbody>
<tr>
<td>D</td>
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Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL blood
Preferred Volume:
6 mL blood
Minimum Volume:
2 mL blood
Remarks:
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.
PROCESSING

Test Code:  
ABPR
Performing Lab:  
Parnassus & Mission Bay Blood Banks
Preferred Volume:  
6 mL blood
Minimum Volume:  
2 mL blood
Unacceptable Conditions:  
Unsigned, mislabeled, unlabeled or hemolyzed sample.

RESULT INTERPRETATION

Additional Information:  
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

See also: ABO, Rh, and Antibody Screen.
RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)
D   15         8
C   32         73
c  20          4
E   71         78
e   2          2
K   91         98
Jka 23          8
Jkb 26         51
Fya 34          90
Fyb 17          77
S   45          69
s   11          7


ADMINISTRATIVE

CPT Codes:  
86900

COMPLETE VIEW

Available Stat:  
Yes
Test Code:  
ABPR
Performing Lab:  
Parnassus & Mission Bay Blood Banks
Performed:  
Test available 24 hours per day 7 days per week
Remarks:  
Use BLOOD BANK requisition. Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.
Collect:  
Lavender top (6 mL size preferred)
Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
2 mL blood

Unacceptable Conditions:
Unsigned, mislabeled, unlabeled or hemolyzed sample.

Reported:
STAT 1 hour, ASAP 2 hours, Routine 4 hours

Reflex Testing:
ABO/Rh confirmation (a one-time requirement) is required before blood products can be set up. To minimize delays in product availability, if the provider mistakenly places an order for a duplicate Type and Screen test, the Blood Bank will reflexively convert that order to an ABO/Rh confirmation test (test code CHEK).

Additional Information:
Typing and screening of blood for transfusion. If antibodies potentially capable of causing Hemolytic Disease of the Newborn are found on the Prenatal screen, these will automatically be titered at an additional charge.

See also: ABO, Rh, and Antibody Screen.

RBC antigen % of antigen negative (Caucasian) % of antigen negative (African-American)

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</tr>
</tbody>
</table>


CPT Codes:
86900
Tyrosine, plasma
TYRO

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
LCMS
Reported:
Set up at least 3x weekly. Turnaround time: 3-5 days.

COLLECTION

Patient Preparation:
Collect specimen after an overnight fast (or at least 4 hours after a meal) if possible. Non-fasting samples are acceptable for pediatric patients
Sample Type:
Heparinized plasma
Collect:
Dark Green top
Amount to Collect:
1 mL blood
Preferred Volume:
0.4 mL plasma
Minimum Volume:
0.2 mL plasma
Remarks:
Provide the patient's age and sex, a brief clinical history and tentative diagnosis, and a description of drug, infant formula or dietary therapy or X-rays in the previous three days.
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 7 days, frozen at -20°C 30 days

PROCESSING

Test Code:
TYRO
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate and immediately freeze plasma at -20°C. Order Quest # 30791P
Preferred Volume:
0.4 mL plasma
Minimum Volume:
0.2 mL plasma
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 7 days, frozen at -20°C 30 days

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:
µmol/L

Reference Interval:

- 0-30 days: 33-160 µmol/L
- 31 days-23 months: 24-125 µmol/L
- 2-17 years: 31-108 µmol/L
- >= 18 years: 38-96 µmol/L

ADMINISTRATIVE

CPT Codes:
84510-90

LOINC Codes:
20660-7

COMPLETE VIEW

Available Stat:
No

Test Code:
TYRO

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LCMS

Patient Preparation:
Collect specimen after an overnight fast (or at least 4 hours after a meal) if possible. Non-fasting samples are acceptable for pediatric patients.

Remarks:
Provide the patient's age and sex, a brief clinical history and tentative diagnosis, and a description of drug, infant formula or dietary therapy or X-rays in the previous three days.

Collect:
Dark Green top

Amount to Collect:
1 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
0.4 mL plasma

Minimum Volume:
0.2 mL plasma

Specimen Preparation:
Separate and immediately freeze plasma at -20C. Order Quest # 30791P

Units:
µmol/L

Reference Interval:

- 0-30 days: 33-160 µmol/L
- 31 days-23 months: 24-125 µmol/L
- 2-17 years: 31-108 µmol/L
- >= 18 years: 38-96 µmol/L

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated 7 days, frozen at -20C 30 days

Reported:
Set up at least 3x weekly. Turnaround time: 3-5 days.
CPT Codes:
  84510-90
LOINC Codes:
  20660-7
U3 RNP Autoantibody

ORDERING

Available Stat:
No

Performing Lab:
RDL Reference Laboratory

Methodology:
iPP

Reported:
10-14 days

COLLECTION

Sample Type:
Serum

Collect:
Red top or Gold top

Amount to Collect:
2 mL blood

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

PROCESSING

Test Code:
U3RNP

Sendout:
Yes

Performing Lab:
RDL Reference Laboratory

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

RESULT INTERPRETATION

Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
83516-90

COMPLETE VIEW

Available Stat:
Test Code: U3RNP

Performing Lab: RDL Reference Laboratory

Sendout: Yes

Methodology: iPP

Collect: Red top or Gold top

Amount to Collect: 2 mL blood

Sample Type: Serum

Preferred Volume: 1 mL serum

Minimum Volume: 1 mL serum

Reference Interval: Negative

Reported: 10-14 days

CPT Codes: 83516-90
UCSF500 Gene Panel Ordering Information
CCGL500

ORDERING

Performing Lab:
UCSF Clinical Cancer Genomics Lab (CCGL)

Performed:
Run weekly on Wednesday, day shift only

Methodology:
Targeted next-generation sequencing (HiSeq)

Reported:
4 weeks

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately. The test was validated by the UCSF Clinical Cancer Genomics Laboratory (CCGL) to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

Synonyms:
- U500, UCSF500, UCSF 500 Cancer Gene Panel

COLLECTION

Collect:
Blood or bone marrow in EDTA (lavender top, 3 cc preferred) Formalin-fixed paraffin embedded tissue (5-10 unstained slides at 10 µm thickness, or FFPE tissue block) Buccal swabs Fresh skin biopsy (1-2 mm punch)

Remarks:
In order to process the request, submit: 1. Completed UCSF500 Gene Panel requisition form 2. Signed UCSF 500 Gene Panel patient consent 3. A source of tumor DNA (see Sample Type), diagnostic and/or relapse 4. A source for normal DNA (see Sample Type) Forms can be scanned into APeX under “Scanned Clinical Documents”, please email ccgl@ucsf.edu to complete order. Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

PROCESSING

Test Code:
CCGL500

Performing Lab:
UCSF Clinical Cancer Genomics Lab (CCGL)

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship samples to CCGL at Mt Zion as soon as possible.

RESULT INTERPRETATION

Reference Interval:
Negative

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately. The test was validated by the UCSF Clinical Cancer Genomics Laboratory (CCGL) to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

ADMINISTRATIVE

CPT Codes:
81479

LDT or Modified FDA:
COMPLETE VIEW

Test Code:
CCGL500

Performing Lab:
UCSF Clinical Cancer Genomics Lab (CCGL)

Performed:
Run weekly on Wednesday, day shift only

Methodology:
Targeted next-generation sequencing (HiSeq)

Remarks:
In order to process the request, submit: 1. Completed UCSF500 Gene Panel requisition form 2. Signed UCSF 500 Gene Panel patient consent 3. A source of tumor DNA (see Sample Type), diagnostic and/or relapse 4. A source for normal DNA (see Sample Type) Forms can be scanned into APeX under “Scanned Clinical Documents”, please email ccgl@ucsf.edu to complete order. Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday. Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Blood or bone marrow in EDTA (lavender top, 3 cc preferred) Formalin-fixed paraffin embedded tissue (5-10 unstained slides at 10 µm thickness, or FFPE tissue block) Buccal swabs Fresh skin biopsy (1-2 mm punch)

Specimen Preparation:
Do not freeze blood or bone marrow samples. Ship samples to CCGL at Mt Zion as soon as possible.

Reference Interval:
Negative

Synonyms:
• U500, UCSF500, UCSF 500 Cancer Gene Panel

Reported:
4 weeks

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately. The test was validated by the UCSF Clinical Cancer Genomics Laboratory (CCGL) to confirm performance characteristics, in compliance with current guidelines for clinical implementation.

CPT Codes:
81479

LDT or Modified FDA:
Yes
UDP Glucuronosyltransferase 1A1
UGT1A1

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Molecular Diagnostics
Performed:
Batched assay performed once every 2 weeks
Methodology:
PCR and Fragment analysis
Reported:
10-14 days
Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Irinotecan is used for the treatment of metastatic carcinoma of the colon or rectum. It causes severe neutropenia and diarrhea in 20-35% of patients undergoing chemotherapy. The ability to predict toxicity in treated patients is an important consideration.

UGT1A1 catalyzes the inactivation of SN-38, the active and toxic metabolite of irinotecan. The 7TA repeat length polymorphism (termed *28 allele) in the UGT1A1 promoter is associated with decreased UGT1A1 gene expression levels, resulting in lower than normal UGT1A1 enzymatic activity and accumulation of SN-38, the active irinotecan metabolite.

About 15% of North Americans are homozygous for the *28/*28 genotype and thus cancer patients carrying this variant exhibit irinotecan related toxicity and would require lower doses of irinotecan than patients carrying the 6 TA repeat (*1 allele). The clinical significance of the rare 5 and 8 TA repeats, termed *36 and *37 allele, respectively, in predicting irinotecan toxicities is not well established.

Synonyms:
- Irenotecan
- UGT1A1
- UGT 1A1

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL
Preferred Volume:
3 mL
Minimum Volume:
1 mL
Remarks:
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Stability (from collection to initiation):
Refrigerated, 1 month.

Unacceptable Conditions:
Insufficient sample received.
Rejection Criteria:
Insufficient sample received. Serum, citrated or heparinized plasma received. Samples > 5 days old when received

**PROCESSING**

**Test Code:**
UGT1A1

**Performing Lab:**
Medical Genomics - Molecular Diagnostics

**Specimen Preparation:**
Do not freeze blood. Refrigerate sample if storage is required.

Ship to China Basin Molecular Diagnostics

**Preferred Volume:**
3 mL

**Minimum Volume:**
1 mL

**Unacceptable Conditions:**
Insufficient sample received.

**Rejection Criteria:**
Insufficient sample received. Serum, citrated or heparinized plasma received. Samples > 5 days old when received

**Stability (from collection to initiation):**
Refrigerated, 1 month.

**RESULT INTERPRETATION**

**Reference Interval:**
Wildtype *1/*1

Most common normal allele is 6 repeats (= *1)

**Additional Information:**
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Irinotecan is used for the treatment of metastatic carcinoma of the colon or rectum. It causes severe neutropenia and diarrhea in 20-35% of patients undergoing chemotherapy. The ability to predict toxicity in treated patients is an important consideration.

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**ADMINISTRATIVE**

**CPT Codes:**
81350

**LDT or Modified FDA:**
Yes

**LOINC Codes:**
51951-2

**COMPLETE VIEW**

**Available Stat:**
No
Test Code:
UGT1A1

Performing Lab:
Medical Genomics - Molecular Diagnostics

Performed:
Batched assay performed once every 2 weeks

Methodology:
PCR and Fragment analysis

Remarks:
Avoid hemolysis. Due to stability issues these samples should only be collected at UCSF Monday through noon Friday.

Do not collect sample in heparin. Keep sample refrigerated for overnight or longer storage.

Collect:
Lavender top

Amount to Collect:
3 mL

Sample Type:
EDTA whole blood

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Rejection Criteria:
Insufficient sample received. Serum, citrated or heparinized plasma received. Samples > 5 days old when received

Unacceptable Conditions:
Insufficient sample received.

Specimen Preparation:
Do not freeze blood. Refrigerate sample if storage is required.

Ship to China Basin Molecular Diagnostics

Reference Interval:
Wildtype *1/*1

Most common normal allele is 6 repeats (= *1)

Synonyms:
- Irenotecan
- UGT1A1
- UGT 1A1

Stability (from collection to initiation):
Refrigerated, 1 month.

Reported:
10-14 days

Additional Information:
An interpretation of this test by a laboratory physician will automatically be performed and billed for separately.

Irinotecan is used for the treatment of metastatic carcinoma of the colon or rectum. It causes severe neutropenia and diarrhea in 20-35% of patients undergoing chemotherapy. The ability to predict toxicity in treated patients is an important consideration.

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CPT Codes:
81350
LDT or Modified FDA:
Yes
LOINC Codes:
51951-2
Universal Microbial DNA
P390

ORDERING

Approval Required:
Yes. Consult with Infectious Disease service prior to specimen collection. Infectious Disease will contact Laboratory Medicine for approval and selection of appropriate PCR test(s).

Performing Lab:
Univ. of Washington

Methodology:
PCR

Additional Information:
Universal microbial PCR can be used to detect infectious agents in sterile tissues and fluids. Specific PCR targets vary by pathogen type as listed: Universal bacterial PCR: 16S ribosomal DNA. Universal fungal PCR: 18S ribosomal DNA, Universal AFB PCR: rpoB and hsp65.

Identification of pathogens is typically successful when organisms are seen on stains, but cultures are negative due to prior antibiotic use or fastidious organisms. Testing of fresh tissue showing no organisms on stain but significant amount of inflammation / granulomas detects pathogens in fewer than 25% of cases. Formalin-fixed tissue should generally be sent only when organisms are seen on stains. Testing of tissue or fluids that do not show inflammation is not indicated.

Synonyms:
- Universal microbial PCR

COLLECTION

Sample Type:
Fresh sterile tissue, or fluid (preferred), formalin-fixed paraffin embedded tissue

Collect:
Sterile tube

Amount to Collect:
- Tissue: 5 cubic mm
- Fluid: 1 mL

Preferred Volume:
- Tissue: 5 cubic mm
- Fluid: 1 mL

Minimum Volume:
- Tissue: 3 cubic mm
- Fluid: 0.5 mL

Remarks:
Fresh sterile tissue or fluid should be submitted to the microbiology laboratory in a separate container, along with specimens for culture (bacterial, fungal and AFB). Test sensitivity is much lower for formalin-fixed paraffin-embedded tissues.

Stability (from collection to initiation):
Frozen 1 month

Rejection Criteria:
Anticoagulated fluids

PROCESSING

Test Code:
P390

Sendout:
Yes

Performing Lab:
Univ. of Washington
Specimen Preparation:
Freeze fresh tissue and fluid at -70C and ship frozen (on dry ice).
Ship formalin fixed paraffin embedded tissue at room temperature.

Preferred Volume:
- Tissue: 5 cubic mm
- Fluid: 1 mL

Minimum Volume:
- Tissue: 3 cubic mm
- Fluid: 0.5 mL

Rejection Criteria:
- Anticoagulated fluids

Stability (from collection to initiation):
- Frozen 1 month

RESULT INTERPRETATION

Reference Interval:
- Microbial DNA not detected

Additional Information:
Universal microbial PCR can be used to detect infectious agents in sterile tissues and fluids. Specific PCR targets vary by pathogen type as listed: Universal bacterial PCR: 16S ribosomal DNA. Universal fungal PCR: 18S ribosomal DNA, Universal AFB PCR: rpoB and hsp65.

Identification of pathogens is typically successful when organisms are seen on stains, but cultures are negative due to prior antibiotic use or fastidious organisms. Testing of fresh tissue showing no organisms on stain but significant amount of inflammation / granulomas detects pathogens in fewer than 25% of cases. Formalin-fixed tissue should generally be sent only when organisms are seen on stains. Testing of tissue or fluids that do not show inflammation is not indicated.

COMPLETE VIEW

Approval Required:
Yes. Consult with Infectious Disease service prior to specimen collection. Infectious Disease will contact Laboratory Medicine for approval and selection of appropriate PCR test(s).

Test Code:
P390

Performing Lab:
Univ. of Washington

Sendout:
Yes

Methodology:
PCR

Remarks:
Fresh sterile tissue or fluid should be submitted to the microbiology laboratory in a separate container, along with specimens for culture (bacterial, fungal and AFB). Test sensitivity is much lower for formalin-fixed paraffin-embedded tissues.

Collect:
- Sterile tube

Amount to Collect:
- Tissue: 5 cubic mm
- Fluid: 1 mL

Sample Type:
- Fresh sterile tissue, or fluid (preferred), formalin-fixed paraffin embedded tissue

Preferred Volume:
- Tissue: 5 cubic mm
- Fluid: 1 mL

Minimum Volume:
- Tissue: 3 cubic mm
Fluid: 0.5 mL

**Rejection Criteria:**
- Anticoagulated fluids

**Specimen Preparation:**
- Freeze fresh tissue and fluid at -70°C and ship frozen (on dry ice).
- Ship formalin fixed paraffin embedded tissue at room temperature.

**Reference Interval:**
- Microbial DNA not detected

**Synonyms:**
- Universal microbial PCR

**Stability (from collection to initiation):**
- Frozen 1 month

**Additional Information:**
Universal microbial PCR can be used to detect infectious agents in sterile tissues and fluids. Specific PCR targets vary by pathogen type as listed: Universal bacterial PCR: 16S ribosomal DNA. Universal fungal PCR: 18S ribosomal DNA, Universal AFB PCR: rpoB and hsp65.

Identification of pathogens is typically successful when organisms are seen on stains, but cultures are negative due to prior antibiotic use or fastidious organisms. Testing of fresh tissue showing no organisms on stain but significant amount of inflammation / granulomas detects pathogens in fewer than 25% of cases. Formalin-fixed tissue should generally be sent only when organisms are seen on stains. Testing of tissue or fluids that do not show inflammation is not indicated.
Unstable Hemoglobin, Isopropanol screen
UHGBI

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Isopropanol precipitation
Reported:
Same day or next weekday
Synonyms:
- Isopropanol stability
- unstable hemoglobin

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
8 mL blood
Preferred Volume:
8 mL blood
Minimum Volume:
3 mL blood
Remarks:
Draw only between 0800-1200 hours Monday-Friday
Stability (from collection to initiation):
Refrigerated 1 week.
Rejection Criteria:
Frozen sample.

PROCESSING

Test Code:
UHGBI
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Keep sample refrigerated. Sample needs to be at China Basin for 4 PM Quest pick-up the same day it is collected.
Preferred Volume:
8 mL blood
Minimum Volume:
3 mL blood
Rejection Criteria:
Frozen sample.
Stability (from collection to initiation):
RESULT INTERPRETATION

Reference Interval:
None detected

ADMINISTRATIVE

CPT Codes:
- 83068-90

LOINC Codes:
- 41619-8

COMPLETE VIEW

Available Stat:
No

Test Code:
UHGBI

Performing Lab:
Quest

Sendout:
Yes

Methodology:
- Isopropanol precipitation

Remarks:
- Draw only between 0800-1200 hours Monday-Friday

Collect:
- Lavender top

Amount to Collect:
8 mL blood

Sample Type:
- EDTA whole blood

Preferred Volume:
8 mL blood

Minimum Volume:
3 mL blood

Rejection Criteria:
- Frozen sample.

Specimen Preparation:
- Keep sample refrigerated. Sample needs to be at China Basin for 4 PM Quest pick-up the same day it is collected.

Reference Interval:
None detected

Synonyms:
- Isopropanol stability
- Unstable hemoglobin

Stability (from collection to initiation):
Refrigerated 1 week.

Reported:
Same day or next weekday

CPT Codes:
- 83068-90

LOINC Codes:
Urea Clearance
URCL

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Enzymatic conductivity, kinetic (urease)
Reported: 4 hours
Additional Information: In normal individuals, urea clearance ranges between 35% - 65% of the GFR depending on hydration status (Diseases of the Kidney and Urinary Tract, R.W Schrier, 8th edition, 2007).

Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

An order for Urea Clearance includes the following parameters:

a. Urine Urea Nitrogen: (Urine urea nitrogen mg/dL x Total Vol in mL x 24) / (100,000 x hours of collection) = g/d

   Note: Only Urine Urea Nitrogen will be reported if no serum sample is received.

b. Urea Clearance Uncorrected: (Urine urea nitrogen mg/dL x Total Volume mL) / (60 x hours of collection x serum urea nitrogen) = mL/min

c. Corrected Urea Clearance: (Total Vol. in mL x urine urea nitrogen mg/dL x 1.73) / (60 x hours of collection x serum urea nitrogen x surface area) = mL/min/1.73 m2

COLLECTION

Sample Type: 24 hour urine AND serum
Collect: 24 hour urine collection container AND Gold top vacutainer
Amount to Collect: Entire 24 hour urine output
2 ml blood
Preferred Volume: Urine: Complete collection
Serum: 1 mL
Minimum Volume: Urine: Complete collection
Serum: 0.2 mL
Remarks:

Refrigerate the collection container during the collection period.

Submit serum (Gold top) drawn within 24 hours of urine collection-preferably within the interval of collection.

Include the patient’s weight in kg and height in cm on the requisition if a corrected clearance is needed.

Stability (from collection to initiation):
Refrigerated 2 days.
Unacceptable Conditions:
   Container not refrigerated during collection.

PROCESSING

Test Code:
   URCL
Test Group:
   Urea
Performing Lab:
   Parnassus & Mission Bay Chemistry
Preferred Volume:
   Urine: Complete collection
   Serum: 1 mL
Minimum Volume:
   Urine: Complete collection
   Serum: 0.2 mL
Unacceptable Conditions:
   Container not refrigerated during collection.
Stability (from collection to initiation):
   Refrigerated 2 days.

RESULT INTERPRETATION

Units:
   mL/min/1.73 m²
Reference Interval:
   See additional information
Additional Information:
   In normal individuals, urea clearance ranges between 35% - 65% of the GFR depending on hydration status (Diseases of the Kidney
   Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete
   than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

An order for Urea Clearance includes the following parameters:

a. Urine Urea Nitrogen: (Urine urea nitrogen mg/dL x Total Vol in mL x 24) / (100,000 x hours of collection) = g/d
   Note: Only Urine Urea Nitrogen will be reported if no serum sample is received.

b. Urea Clearance Uncorrected: (Urine urea nitrogen mg/dL x Total Volume mL) / (60 x hours of collection x serum urea nitrogen) =
   mL/min

c. Corrected Urea Clearance: (Total Vol. in mL x urine urea nitrogen mg/dL x 1.73) / (60 x hours of collection x serum urea nitrogen x
   surface area) = mL/min/1.73 m²

COMPLETE VIEW

Available Stat:
   No
Test Code:
   URCL
Test Group:
   Urea
Performing Lab:
   Parnassus & Mission Bay Chemistry
Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Enzymatic conductivity, kinetic (urease)

Remarks:
Refrigerate the collection container during the collection period.

Submit serum (Gold top) drawn within 24 hours of urine collection-preferably within the interval of collection.

Include the patient's weight in kg and height in cm on the requisition if a corrected clearance is needed.

Collect:
24 hour urine collection container AND Gold top vacutainer

Amount to Collect:
Entire 24 hour urine output
2 ml blood

Sample Type:
24 hour urine AND serum

Preferred Volume:
Urine: Complete collection
Serum: 1 mL

Minimum Volume:
Urine: Complete collection
Serum: 0.2 mL

Unacceptable Conditions:
Container not refrigerated during collection.

Units:
/mL/min/1.73 m²

Reference Interval:
See additional information

Stability (from collection to initiation):
Refrigerated 2 days.

Reported:
4 hours

Additional Information:
In normal individuals, urea clearance ranges between 35% - 65% of the GFR depending on hydration status (Diseases of the Kidney and Urinary Tract, R.W Schrier, 8th edition, 2007).

Note: Clearances are often inaccurate because of incomplete urine collection. A 4- or 6-hour collection is likely to be more complete than the classic 24 hour test, but extrapolation of results from shortened collections may not be accurate.

An order for Urea Clearance includes the following parameters:

a. Urine Urea Nitrogen: (Urine urea nitrogen mg/dL x Total Vol in mL x 24) / (100,000 x hours of collection) = g/d

Note: Only Urine Urea Nitrogen will be reported if no serum sample is received.

b. Urea Clearance Uncorrected: (Urine urea nitrogen mg/dL x Total Volume mL) / (60 x hours of collection x serum urea nitrogen) = mL/min

c. Corrected Urea Clearance: (Total Vol. in mL x urine urea nitrogen mg/dL x 1.73) / (60 x hours of collection x serum urea nitrogen x surface area) = mL/min/1.73 m²
Urea Nitrogen, 24 hour (or timed) urine
UNU

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Enzymatic conductivity, kinetic (urease)
Reported: Same or next day
Additional Information:
- To convert mg/dL to mmol/L (SI units) multiply by 0.357.
- Output varies with diet.
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Synonyms:
- UUN

COLLECTION

Sample Type: Timed urine collection
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output for collection period
Preferred Volume: 1 mL urine
Minimum Volume: 0.2 mL urine
Remarks:
- Refrigerate the container during the period of the collection.
- Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Stability (from collection to initiation):
- Refrigerated 2 days

Unacceptable Conditions:
- Container not refrigerated during collection.

PROCESSING

Test Code: UNU
Test Group: Urea
Performing Lab:
  Parnassus & Mission Bay Chemistry

Preferred Volume:
  1 mL urine

Minimum Volume:
  0.2 mL urine

Unacceptable Conditions:
  Container not refrigerated during collection.

Stability (from collection to initiation):
  Refrigerated 2 days

RESULT INTERPRETATION

Units:
  g/D

Reference Interval:
  10-20 g/D

Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.357.
  Output varies with diet.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
  84540

COMPLETE VIEW

Available Stat:
  No

Test Code:
  UNU

Test Group:
  Urea

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
  Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
  Enzymatic conductivity, kinetic (urease)

Remarks:
  Refrigerate the container during the period of the collection.

  Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

  Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
  24 hour urine collection container

Amount to Collect:
  Entire urine output for collection period

Sample Type:
Timed urine collection

Preferred Volume:
1 mL urine

Minimum Volume:
0.2 mL urine

Unacceptable Conditions:
Container not refrigerated during collection.

Units:
g/D

Reference Interval:
10-20 g/D

Synonyms:
• UUN

Stability (from collection to initiation):
Refrigerated 2 days

Reported:
Same or next day

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.

Output varies with diet.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

CPT Codes:
84540
Urea Nitrogen, Body Fluid

UNB

ORDERING

Ordering Recommendations:
Not a routinely available test. See 'Additional information'

Available Stat:
No

Performing Lab:
  Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzymatic conductivity, kinetic (urease)

Reported:
4 hours

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

COLLECTION

Sample Type:
Body Fluid

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
UNB

Test Group:
Urea

Performing Lab:
  Parnassus & Mission Bay Chemistry

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

RESULT INTERPRETATION

Units:
mg/dL

Additional Information:
As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

ADMINISTRATIVE

CPT Codes:
84520

LOINC Codes:
3093-2

COMPLETE VIEW

Available Stat:
No

Ordering Recommendations:
Not a routinely available test. See ‘Additional information’

Test Code:
UNB

Test Group:
Urea

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzymatic conductivity, kinetic (urease)

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
Red top or clean container

Amount to Collect:
5 mL fluid

Sample Type:
Body Fluid

Preferred Volume:
1 mL fluid

Minimum Volume:
0.2 mL fluid

Units:
mg/dL

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:
Additional Information:

As normal samples are not available for validating the performance of this assay, the UCSF Clinical laboratory makes no claims with regard to the accuracy of the result.

All results will be appended with a disclaimer: “The reference range and other method performance specifications have not been established by the UCSF Clinical Laboratory for this body fluid. The test result must be integrated into the clinical context for interpretation.”

CPT Codes:

84520

LOINC Codes:

3093-2
Urea Nitrogen, Plasma / Serum
BUN

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzymatic conductivity, kinetic (urease)

Reported:
STAT 1 hour, Routine 4 hours

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.

Synonyms:
- BUN
- SUN

COLLECTION

Sample Type:
Plasma or serum

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code:
BUN

Test Group:
Urea

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

RESULT INTERPRETATION

Printed 06/07/19
Test information subject to change
Units:

mg/dL

Reference Interval:

0 - 4 years: 5-27 mg/dL
>= 5 years: 6-22 mg/dL

Note:
1. Normal range for children 0-5 years adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.

ADMINISTRATIVE

CPT Codes:
84520

LOINC Codes:
3094-0

COMPLETE VIEW

Available Stat:
Yes

Test Code:
BUN

Test Group:
Urea

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Enzymatic conductivity, kinetic (urease)

Collect:
Light green top preferred, Gold top acceptable

Amount to Collect:
1 mL blood

Sample Type:
Plasma or serum

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

Units:
mg/dL

Reference Interval:

0 - 4 years: 5-27 mg/dL
>= 5 years: 6-22 mg/dL

Note:
1. Normal range for children 0-5 years adapted from Beckman Coulter's "Pediatric Reference Range Guidelines for Synchron Systems" Bulletin 9345
3. Normal range for adults was determined by testing 270 male and female healthy blood donors at UCSF.

Synonyms:
- BUN
- SUN

Stability (from collection to initiation):
- Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

Reported:
- STAT 1 hour, Routine 4 hours

Additional Information:
- To convert mg/dL to mmol/L (SI units) multiply by 0.357.

CPT Codes:
- 84520

LOINC Codes:
- 3094-0
Urea Nitrogen, random urine
UNUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Enzymatic conductivity, kinetic (urease)
Reported:
Same or next day
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.357.
Output varies with diet.
Synonyms:
• UUN

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
UNUR
Test Group:
Urea
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine
Minimum Volume:
0.2 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION
Units:
  mg/dL
Reference Interval:
  See Additional Information
Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.357.
  Output varies with diet.

ADMINISTRATIVE

CPT Codes:
  84540
LOINC Codes:
  3095-7

COMPLETE VIEW

Available Stat:
  No
Test Code:
  UNUR
Test Group:
  Urea
Performing Lab:
  Parnassus & Mission Bay Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Enzymatic conductivity, kinetic (urease)
Collect:
  Urine cup
Amount to Collect:
  20 mL urine
Sample Type:
  Random urine
Preferred Volume:
  1 mL urine
Minimum Volume:
  0.2 mL urine
Units:
  mg/dL
Reference Interval:
  See Additional Information
Synonyms:
  • UUN
Stability (from collection to initiation):
  Refrigerated 2 days
Reported:
  Same or next day
Additional Information:
  To convert mg/dL to mmol/L (SI units) multiply by 0.357.
  Output varies with diet.
CPT Codes:
84540

LOINC Codes:
3095-7
Urea Reduction Ratio

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Enzymatic conductivity, kinetic (urease)
Reported: 4 hours
Additional Information:
Urea Reduction Ratio orders include the following parameters:

a. Post Dialysis BUN (mg/dL)
b. Urea Reduction Ratio: \((\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) \times 100 / \text{Pre-dialysis BUN}\) = %
c. Quick Kt/V (Jindal): \([0.04 \times (\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) - 1.2] / (\text{Pre-dialysis BUN} \times 100)\)

Quick Kt/V correlates with full Kt/V within the range 0.6 to 1.8
Synonyms:
• URR

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week.

PROCESSING

Test Code: URR
Test Group: Urea
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation):
Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week.
RESULT INTERPRETATION

Units:

%  

Additional Information:

Urea Reduction Ratio orders include the following parameters:

a. Post Dialysis BUN (mg/dL)
b. Urea Reduction Ratio: \((\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) \times 100 / \text{Pre-dialysis BUN} \) = %
c. Quick Kt/V (Jindal): \[0.04 \times (\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) - 1.2\] / (Pre-dialysis BUN x 100)

Quick Kt/V correlates with full Kt/V within the range 0.6 to 1.8

ADMINISTRATIVE

CPT Codes:

84520

COMPLETE VIEW

Available Stat:

No

Test Code:

URR

Test Group:

Urea

Performing Lab:

Parnassus & Mission Bay Chemistry

Performed:

Test available 24 hours per day 7 days per week

Methodology:

Enzymatic conductivity, kinetic (urease)

Collect:

Gold top or Light green top

Amount to Collect:

1 mL blood

Sample Type:

Serum or plasma

Preferred Volume:

0.5 mL serum or plasma

Minimum Volume:

0.2 mL serum or plasma

Units:

%  

Synonyms:

• URR

Stability (from collection to initiation):

Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week.

Reported:

4 hours

Additional Information:

Urea Reduction Ratio orders include the following parameters:

a. Post Dialysis BUN (mg/dL)
b. Urea Reduction Ratio: \((\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) \times 100 / \text{Pre-dialysis BUN} \) = %
c. Quick Kt/V (Jindal): \[
\frac{0.04 \times (\text{Pre-dialysis BUN} - \text{Post-dialysis BUN}) - 1.2}{\text{Pre-dialysis BUN} \times 100}
\]

Quick Kt/V correlates with full Kt/V within the range 0.6 to 1.8

**CPT Codes:**

84520
Ureaplasma / mycoplasma hominis culture
P319

ORDERING

Approval Required:
Yes, contact Microbiology at x3-1268 for non-genital samples.

Available Stat:
No

Performing Lab:
Quest

Reported:
10-15 days

Synonyms:
- Mycoplasma culture

COLLECTION

Sample Type:
Cervical, vaginal or urethral swab

Collect:
Special medium (see collection instructions)

Remarks:
Specimens should be collected Monday through Friday only so that culture can be set up within 24 hours.

Collection kits, containing swabs and UTM medium, can be obtained from Moffitt-Long Microbiology Laboratory or Mount Zion Virology Laboratory.

All specimen types must be submitted in this medium. If a swab specimen is to be collected, use swab in this kit for specimen collection and bend or break swab to fit inside tube of UTM medium.

Stability (from collection to initiation):
Refrigerated 2 days, frozen 1 month

Unacceptable Conditions:
Not submitted in UTM medium

PROCESSING

Test Code:
P319

Test Group:
Mycoplasma

Sendout:
Yes

Performing Lab:
Quest

Specimen Preparation:
At T319 prompt, enter code MYCUL

Unacceptable Conditions:
Not submitted in UTM medium

Stability (from collection to initiation):
Refrigerated 2 days, frozen 1 month

RESULT INTERPRETATION
Reference Interval:
Negative

ADMINISTRATIVE

CPT Codes:
87109-90

LOINC Codes:
29257-3

COMPLETE VIEW

Approval Required:
Yes, contact Microbiology at x3-1268 for non-genital samples.

Available Stat:
No

Test Code:
P319

Test Group:
Mycoplasma

Performing Lab:
Quest

Sendout:
Yes

Remarks:
Specimens should be collected Monday through Friday only so that culture can be set up within 24 hours.

Collection kits, containing swabs and UTM medium, can be obtained from Moffitt-Long Microbiology Laboratory or Mount Zion Virology Laboratory.

All specimen types must be submitted in this medium. If a swab specimen is to be collected, use swab in this kit for specimen collection and bend or break swab to fit inside tube of UTM medium.

Collect:
Special medium (see collection instructions)

Sample Type:
Cervical, vaginal or urethral swab

Unacceptable Conditions:
Not submitted in UTM medium

Specimen Preparation:
At T319 prompt, enter code MYCUL

Reference Interval:
Negative

Synonyms:
- Mycoplasma culture

Stability (from collection to initiation):
Refrigerated 2 days, frozen 1 month

Reported:
10-15 days

CPT Codes:
87109-90

LOINC Codes:
29257-3
Ureaplasma/Mycoplasma PCR
P319

ORDERING

Approval Required:
Yes (exception: urine specimens submitted by Urology service do not require approval)

Performing Lab:
ARUP or Quest

Methodology:
PCR

Reported:
5 days

Synonyms:
- M.hominis
- M.genitalium
- U.parvum
- U.urealyticum

COLLECTION

Sample Type:
ARUP: genital swab or urine in viral transport media
Quest: vaginal swab, urethral swab, or urine in appropriate Aptima transport media

Collect:
ARUP: viral transport media
Quest: Aptima transport media

Amount to Collect:
ARUP: 1mL urine
Quest: 2mL urine

Stability (from collection to initiation):
ARUP (viral transport media): 24 hours at room temp, 10 days refrigerated, 3 months frozen
Quest (Aptima transport media): 14 days room temp, 14 days refrigerated, 30 days frozen

Storage/Transport Temperature:
ARUP: frozen
Quest: room temp

PROCESSING

Test Code:
P319

ARUP Test Code:
2011172

Sendout:
Yes

Performing Lab:
ARUP or Quest

Specimen Preparation:
ARUP: transfer 1mL urine to viral transport media
Quest: transfer 2mL urine to appropriate Aptima transport tube

ARUP test code: 2011172
Quest test code: 91477

Stability (from collection to initiation):
Printed 06/07/19
Test information subject to change
ARUP (viral transport media): 24 hours at room temp, 10 days refrigerated, 3 months frozen
Quest (Aptima transport media): 14 days room temp, 14 days refrigerated, 30 days frozen

Storage/Transport Temperature:
ARUP: frozen
Quest: room temp

RESULT INTERPRETATION

Reference Interval:
Not detected

ADMINISTRATIVE

CPT Codes:
ARUP: 87798 x 4
Quest: 87798 x 5

LOINC Codes:
ARUP: 31208-2, 69933-0, 69935-5, 51988-4, 68546-1
Quest: 68546-1, 69935-5, 69933-0, 51988-4

COMPLETE VIEW

Approval Required:
Yes (exception: urine specimens submitted by Urology service do not require approval)

Test Code:
P319

ARUP Test Code:
2011172

Performing Lab:
ARUP or Quest

Sendout:
Yes

Methodology:
PCR

Collect:
ARUP: viral transport media
Quest: Aptima transport media

Amount to Collect:
ARUP: 1mL urine
Quest: 2mL urine

Sample Type:
ARUP: genital swab or urine in viral transport media
Quest: vaginal swab, urethral swab, or urine in appropriate Aptima transport media

Specimen Preparation:
ARUP: transfer 1mL urine to viral transport media
Quest: transfer 2mL urine to appropriate Aptima transport tube

ARUP test code: 2011172
Quest test code: 91477

Reference Interval:
Not detected

Synonyms:
- M.hominis
- M.genitalium
- U.parvum
- U.urealyticum
Storage/Transport Temperature:
  ARUP: frozen
  Quest: room temp

Stability (from collection to initiation):
  ARUP (viral transport media): 24 hours at room temp, 10 days refrigerated, 3 months frozen
  Quest (Aptima transport media): 14 days room temp, 14 days refrigerated, 30 days frozen

Reported:
  5 days

CPT Codes:
  ARUP: 87798 x 4
  Quest: 87798 x 5

LOINC Codes:
  ARUP: 31208-2, 69933-0, 51988-4, 68546-1, 69935-5
  Quest: 68546-1, 69935-5, 69933-0, 51988-4
Uric Acid, 24 hour (or timed) urine
UCAU

ORDERING

Available Stat: No
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 7 days per week from 8:00 AM to midnight only.
Methodology: Spectrophotometric (uricase)
Reported: Same or next day
Additional Information:
- To convert mg/dL to mmol/L (SI units) multiply by 0.059.
- Output varies with diet.
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

COLLECTION

Sample Type: Timed urine collection
Collect: 24 hour urine collection container
Amount to Collect: Entire urine output during collection period
Preferred Volume: 1 mL urine
Minimum Volume: 0.25 mL urine
Remarks:
- Keep collection container at room temperature during the period of collection.
- Note that the minimum acceptable time period for a 'timed' collection is 6 hours.
- Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.
Stability (from collection to initiation):
- Refrigerated 2 days

PROCESSING

Test Code: UCAU
Test Group: Uric acid
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 1 mL urine
Minimum Volume:
0.25 mL urine

Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/D

Reference Interval:
250-750mg/D

Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.059.
Output varies with diet.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

ADMINISTRATIVE

CPT Codes:
84560

COMPLETE VIEW

Available Stat:
No

Test Code:
UCAU

Test Group:
Uric acid

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 7 days per week from 8:00 AM to midnight only.

Methodology:
Spectrophotometric (uricase)

Remarks:
Keep collection container at room temperature during the period of collection.

Note that the minimum acceptable time period for a 'timed' collection is 6 hours.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

Collect:
24 hour urine collection container

Amount to Collect:
Entire urine output during collection period

Sample Type:
Timed urine collection

Preferred Volume:
1 mL urine

Minimum Volume:
0.25 mL urine

Units:
Reference Interval:  
250-750mg/D

Stability (from collection to initiation):  
Refrigerated 2 days

Reported:  
Same or next day

Additional Information:  
To convert mg/dL to mmol/L (SI units) multiply by 0.059.

Output varies with diet.

Results of collections of less than 24 hour duration will be adjusted to reflect a '24 hour collection'. The limited time of collection as well as the need to adjust the values to be comparable to the '24 hour' normal ranges will inherently affect the accuracy of the results.

CPT Codes:  
84560
Uric Acid, Plasma / Serum
URIC

ORDERING

Available Stat:
No
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (uricase)
Reported:
4 hours
Additional Information:
Severe hyperbilirubinemia may artifactually decrease the result.

To convert mg/dL to mmol/L (SI units) multiply by 0.059

For patients on rasburicase therapy, it is recommended that Uric Acid, Rasburicase Therapy" (URICR) be ordered and samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample transport (Lim E, Bennett P, Beilby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

According to some sources, "Although serum uric acid (SU) levels < 8 mg/dl are generally considered to be normal, serum levels > 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate." Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al .J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a "normal" SU by either definition does not exclude an acute gouty attack.

COLLECTION

Sample Type:
Plasma or serum
Collect:
Light green top preferred, Gold top acceptable (on ice if patient receiving Rubaricase)
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL plasma or serum
Minimum Volume:
0.2 mL plasma or serum
Remarks:
Collection after overnight fast preferred.

For patients on rasburicase therapy, it is recommended that the test "Uric Acid, Rasburicase Therapy" (URICR) be ordered.

It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

PROCESSING

Test Code:
URIC
Test Group:
Uric acid

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Chemistry

Specimen Preparation:
If RASBURICASE THERAPY is indicated on the requisition the sample must be centrifuged cold and be kept refrigerated at 4C until testing. Deliver spun sample on ice to Chemistry asap.

Preferred Volume:
0.5 mL plasma or serum

Minimum Volume:
0.2 mL plasma or serum

RESULT INTERPRETATION

Units:
mg/dL

Reference Interval:

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2. Normal range for adults was determined by testing 137 male and 129 female healthy blood donors at UCSF.

Additional Information:
Severe hyperbilirubinemia may artifactually decrease the result.

To convert mg/dL to mmol/L (SI units) multiply by 0.059

For patients on rasburicase therapy, it is recommended that Uric Acid, Rasburicase Therapy” (URICR) be ordered and samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample transport (Lim E, Bennett P, Beilby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

According to some sources, “Although serum uric acid (SU) levels < 8 mg/dl are generally considered to be normal, serum levels > 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate.” Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a “normal” SU by either definition does not exclude an acute gouty attack.

ADMINISTRATIVE

CPT Codes:
84550

LOINC Codes:
3084-1
Available Stat: No
Test Code: URIC
Test Group: Uric acid
Performing Lab: Parnassus, Mission Bay & Mt. Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric (uricase)
Remarks: Collection after overnight fast preferred.
For patients on rasburicase therapy, it is recommended that the test "Uric Acid, Rasburicase Therapy" (URICR) be ordered.
It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.
Collect: Light green top preferred, Gold top acceptable (on ice if patient receiving Rubaricase)
Amount to Collect: 1 mL blood
Sample Type: Plasma or serum
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Specimen Preparation: If RASBURICASE THERAPY is indicated on the requisition the sample must be centrifuged cold and be kept refrigerated at 4C until testing. Deliver spun sample on ice to Chemistry asap.
Units: mg/dL
Reference Interval:

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2. Normal range for adults was determined by testing 137 male and 129 female healthy blood donors at UCSF.
Reported: 4 hours
Additional Information: Severe hyperbilirubinemia may artfactually decrease the result.
To convert mg/dL to mmol/L (SI units) multiply by 0.059
For patients on rasburicase therapy, it is recommended that Uric Acid, Rasburicase Therapy" (URICR) be ordered and samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample
transport (Lim E, Bennett P, Beilby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

According to some sources, "Although serum uric acid (SU) levels < 8 mg/dl are generally considered to be normal, serum levels > 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate." Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al. J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a "normal" SU by either definition does not exclude an acute gouty attack.

CPT Codes:
84550

LOINC Codes:
3084-1
Uric Acid, Plasma / Serum, Rasburicase Therapy

ORDERING

Available Stat:
  No
Performing Lab:
  Parnassus, Mission Bay & Mount Zion Chemistry
Performed:
  Test available 24 hours per day 7 days per week
Methodology:
  Spectrophotometric (Uricase)
Reported:
  4 hours
Additional Information:
  Severe hyperbilirubinemia may artifactually decrease the result.
  
  To convert mg/dL to mmol/L (SI units) multiply by 0.059
  
  For patients on rasburicase therapy, it is recommended that samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample transport (Lim E, Bennett P, Beliby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.
  
  According to some sources, “Although serum urate (SU) levels 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate.” Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al. J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a “normal” SU by either definition does not exclude an acute gouty attack.

Synonyms:
  • Urate
  • Gout

COLLECTION

Sample Type:
  Plasma or serum
Collect:
  Light green top (on ice) preferred, Gold top (on ice) acceptable.
Amount to Collect:
  1 mL blood
Preferred Volume:
  0.5 mL plasma or serum
Minimum Volume:
  0.2 mL plasma or serum
Remarks:
  Deliver to lab immediately on ICE
  
  It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.
Performing Lab:

Parnassus, Mission Bay & Mount Zion Chemistry

Specimen Preparation:

Provide immediately to Chemistry at Parnassus, Mission Bay or Mt Zion who will centrifuge and assay sample.

If specimen cannot be run at either site centrifuge immediately. Aliquot and freeze the plasma (-20C) immediately and send immediately to other site for testing.

If sample is NOT delivered on ice, immediately transport sample to the testing section and inform them the specimen was NOT received on ice.

Preferred Volume:

0.5 mL plasma or serum

Minimum Volume:

0.2 mL plasma or serum

RESULT INTERPRETATION

Reference Interval:

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2. Normal range for adults was determined by testing 137 male and 129 female healthy blood donors at UCSF.

Additional Information:

Severe hyperbilirubinemia may artifically decrease the result.

To convert mg/dL to mmol/L (SI units) multiply by 0.059

For patients on rasburicase therapy, it is recommended that samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample transport (Lim E, Bennett P, Beiby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

According to some sources, "Although serum urate (SU) levels 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate." Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al. J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a "normal" SU by either definition does not exclude an acute gouty attack.

CPT Codes:

84550

LOINC Codes:

3084-1
Available Stat: No
Test Code: URICR
Performing Lab: Parnassus, Mission Bay & Mount Zion Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Spectrophotometric (Uricase)
Remarks: Deliver to lab immediately on ICE
   It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.
Collect: Light green top (on ice) preferred, Gold top (on ice) acceptable.
Amount to Collect: 1 mL blood
Sample Type: Plasma or serum
Preferred Volume: 0.5 mL plasma or serum
Minimum Volume: 0.2 mL plasma or serum
Specimen Preparation: Provide immediately to Chemistry at Parnassus, Mission Bay or Mt Zion who will centrifuge and assay sample.
   If specimen cannot be run at either site centrifuge immediately. Aliquot and freeze the plasma (-20C) immediately and send immediately to other site for testing
   If sample is NOT delivered on ice, immediately transport sample to the testing section and inform them the specimen was NOT received on ice.
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2. Normal range for adults was determined by testing 137 male and 129 female healthy blood donors at UCSF.

Synonyms:
- Urate
- Gout

Reported: 4 hours
Additional Information: Severe hyperbilirubinemia may artifactually decrease the result.
To convert mg/dL to mmol/L (SI units) multiply by 0.059
For patients on rasburicase therapy, it is recommended that samples be sent to the laboratory on ice and maintained at 4C until analysis to minimize in vitro degradation of uric acid that can occur due to sample transport (Lim E, Bennett P, Beilby J, Clinical Chemistry 2003;49:1417-1419). Uric acid samples in patients on rasburicase therapy should also be centrifuged cold and be kept refrigerated at 4C until testing. It is recommended that this sample handling procedure for uric acid be followed for up to 4 days after the last dose of rasburicase is administered.

According to some sources, "Although serum urate (SU) levels 6.8 mg/dl are above saturation level and may allow deposition of gouty crystals. A SU level of approximately 6.8 mg/dl is the concentration at which monosodium urate crystals begin to precipitate." Based on these considerations, some authorities recommend that that a normal SU should be considered below 6.8 mg/dL (Schlesinger et al . J Rheumatol 2009;36:1287-9). During an acute gouty attack, as many as 14% of patients may have a SU <= 6 mg/dL and 32% may have SU of <= 8 mg/dL. Thus, a "normal" SU by either definition does not exclude an acute gouty attack.

CPT Codes:

84550

LOINC Codes:

3084-1
Uric Acid, random urine
UAUR

ORDERING

Available Stat:
No
Performing Lab:
Parnassus & Mission Bay Chemistry
Performed:
Test available 24 hours per day 7 days per week
Methodology:
Spectrophotometric (uricase)
Reported:
Same or next day
Additional Information:
To convert mg/dL to mmol/L (SI units) multiply by 0.059.
Output varies with diet.

COLLECTION

Sample Type:
Random urine
Collect:
Urine cup
Amount to Collect:
20 mL urine
Preferred Volume:
1 mL urine
Minimum Volume:
0.25 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

PROCESSING

Test Code:
UAUR
Test Group:
Uric acid
Performing Lab:
Parnassus & Mission Bay Chemistry
Preferred Volume:
1 mL urine
Minimum Volume:
0.25 mL urine
Stability (from collection to initiation):
Refrigerated 2 days

RESULT INTERPRETATION

Units:
mg/dL
**Reference Interval:**

See Additional Information

**Additional Information:**

To convert mg/dL to mmol/L (SI units) multiply by 0.059.

Output varies with diet.

**ADMINISTRATIVE**

**CPT Codes:**

84560

**LOINC Codes:**

3086-6

**COMPLETE VIEW**

**Available Stat:**

No

**Test Code:**

UAUR

**Test Group:**

Uric acid

**Performing Lab:**

Parnassus & Mission Bay Chemistry

**Performed:**

Test available 24 hours per day 7 days per week

**Methodology:**

Spectrophotometric (uricase)

**Collect:**

Urine cup

**Amount to Collect:**

20 mL urine

**Sample Type:**

Random urine

**Preferred Volume:**

1 mL urine

**Minimum Volume:**

0.25 mL urine

**Units:**

mg/dL

**Reference Interval:**

See Additional Information

**Stability (from collection to initiation):**

Refrigerated 2 days

**Reported:**

Same or next day

**Additional Information:**

To convert mg/dL to mmol/L (SI units) multiply by 0.059.

Output varies with diet.

**CPT Codes:**

84560

**LOINC Codes:**

3086-6
Urinalysis with microscopy
UAWM, UMI

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Dipstick and microscopy

Reported:
2 hours

Additional Information:
Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Crystals are reported as "present", if found, other formed elements (e.g., casts) are semi-quantitated and reported as 1-5, 5-10 or > 10 per Low Power Field (LPF).

Microscopy will automatically be canceled if the dipstick test does not detect at least trace amounts of protein, esterase or hemoglobin.

Synonyms:
• UA
• Urine sediment examination

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
See preferred volume

Preferred Volume:
20 mL urine

Minimum Volume:
3 mL urine

Remarks:
First AM void preferred. Deliver sample to lab asap. Refrigerate samples if delivery is delayed. Testing is optimal when done within 1-2 hours of collection.

Stability (from collection to initiation):
2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

Unacceptable Conditions:
Samples received > 4 hours after collection.

PROCESSING

Test Code:
UAWM
UMI (for add on microscopic examination)

Test Group:
Urinalysis

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Specimen Preparation:
Deliver all urinalysis samples to Hematology as soon as possible after receipt. If collection time is unknown, use receipt time for stability. Sample suitability from 2-4 hours is decided in Hematology

Preferred Volume:
20 mL urine

Minimum Volume:
3 mL urine

Unacceptable Conditions:
Samples received > 4 hours after collection.

Stability (from collection to initiation):
2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

RESULT INTERPRETATION

Reference Interval:
See Urinalysis, Macroscopic for dipstick testing normal ranges.

Microscopy normal ranges:

< 5 WBC/HPF
< 3 RBC/HPF

Data based on minimum sample size of 10 mL and may not be applicable to samples of less than 10 mL.

Additional Information:
Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Crystals are reported as “present”, if found, other formed elements (e.g., casts) are semi-quantitated and reported as 1-5, 5-10 or > 10 per Low Power Field (LPF).

Microscopy will automatically be canceled if the dipstick test does not detect at least trace amounts of protein, esterase or hemoglobin.

ADMINISTRATIVE

CPT Codes:
81001 (UA w/micro)

COMPLETE VIEW

Available Stat:
Yes

Test Code:
UAWM
UMI (for add on microscopic examination)

Test Group:
Urinalysis

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Dipstick and microscopy
Remarks:
First AM void preferred. Deliver sample to lab asap. Refrigerate samples if delivery is delayed. Testing is optimal when done within 1-2 hours of collection.

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
20 mL urine

Minimum Volume:
3 mL urine

Unacceptable Conditions:
Samples received > 4 hours after collection.

Specimen Preparation:
Deliver all urinalysis samples to Hematology as soon as possible after receipt. If collection time is unknown, use receipt time for stability. Sample suitability from 2-4 hours is decided in Hematology

Reference Interval:
See Urinalysis, Macroscopic for dipstick testing normal ranges.

Microscopy normal ranges:

< 5 WBC/HPF
< 3 RBC/HPF

Data based on minimum sample size of 10 mL and may not be applicable to samples of less than 10 mL.

Synonyms:
• UA
• Urine sediment examination

Stability (from collection to initiation):
2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

Reported:
2 hours

Additional Information:
Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Crystals are reported as "present", if found, other formed elements (e.g., casts) are semi-quantitated and reported as 1-5, 5-10 or > 10 per Low Power Field (LPF).

Microscopy will automatically be canceled if the dipstick test does not detect at least trace amounts of protein, esterase or hemoglobin.

CPT Codes:
81001 (UA w/micro)
Urinalysis, Macroscopic
UA, UAWM

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Dipstick with automated reader

Reported:
STAT 1 hour, Routine 2 hours

Additional Information:
Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Note: Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

Specific Gravity: Reported as

<table>
<thead>
<tr>
<th>Scale</th>
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<tbody>
<tr>
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<tr>
<td>4+</td>
<td>&gt;= 2000 mg/dL</td>
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</table>

Reflex Testing:

Samples submitted with orders for Urinalysis with microscopic examination (UAWM) that are negative for Protein, Hemoglobin, Leukocyte esterase AND Ascorbic acid (Vit. C) will not be evaluated microscopically. The UAWM will be canceled and just the Macroscopic urinalysis (UA) will be charged.

Samples submitted with orders for Urine macroscopic only (UA) that are positive for ascorbic acid (Vit. C) but negative for hemoglobin will be evaluated microscopically to rule out the presence of red cells. The UA will be canceled and a Urinalysis with microscopic examination will be ordered and billed (See additional information)

Synonyms:
- UA
- Urine dipstick
- Urine pH
• Specific gravity, urine
• Urine hemoglobin
• Urine protein
• Urine glucose
• Urine nitrate
• Urine Leukocyte esterase
• Urine ketones
• Urine bilirubin
• Qualitative sugar, urine
• Urobilinogen

**COLLECTION**

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
See preferred volume

Preferred Volume:
20 mL urine

Minimum Volume:
Macroscopic alone (UA): 2 mL urine
With Microscopic (UAWM): 3 mL urine

Remarks:
First AM void preferred. Deliver sample to lab asap. Refrigerate samples if delivery is delayed. Testing is optimal when done within 1-2 hours of collection.

Stability (from collection to initiation):
2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

Unacceptable Conditions:
Samples received > 4 hours after collection.

**PROCESSING**

Test Code:
UA (macroscopic alone) or UAWM (with microscopy)

Test Group:
Urinalysis

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Specimen Preparation:
Deliver all urinalysis samples to Hematology as soon as possible after receipt. If collection time is unknown, use receipt time for stability. Sample suitability from 2-4 hours is decided in Hematology

Preferred Volume:
20 mL urine

Minimum Volume:
Macroscopic alone (UA): 2 mL urine
With Microscopic (UAWM): 3 mL urine

Unacceptable Conditions:
Samples received > 4 hours after collection.

Stability (from collection to initiation):
2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

RESULT INTERPRETATION

Units:
- Protein: mg/dL
- Glucose: mg/dL
- Ketones: mg/dL
- Urobilinogen: mg/dL (EU/dL)

Reference Interval:
- Protein: Negative
- Glucose: Negative
- Ketones: Negative
- Bilirubin: Negative
- Hemoglobin (Myoglobin): Negative
- Nitrite: Negative
- Leukocyte Esterase: Negative
- Urobilinogen: Negative
- pH: 4.5-8.0
- Specific Gravity: 1.002-1.030

Additional Information:
Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Note: Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

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</tbody>
</table>

COMPLETE VIEW

Available Stat:
Yes

Test Code:
UA (macroscopic alone) or UAWM (with microscopy)
Test Group:
Urinalysis

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Dipstick with automated reader

Remarks:
First AM void preferred. Deliver sample to lab asap. Refrigerate samples if delivery is delayed. Testing is optimal when done within 1-2 hours of collection.

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
20 mL urine

Minimum Volume:
Macroscopic alone (UA): 2 mL urine
With Microscopic (UAWM): 3 mL urine

Unacceptable Conditions:
Samples received > 4 hours after collection.

Specimen Preparation:
Deliver all urinalysis samples to Hematology as soon as possible after receipt. If collection time is unknown, use receipt time for stability. Sample suitability from 2-4 hours is decided in Hematology

Units:
Protein: mg/dL
Glucose: mg/dL
Ketones: mg/dL
Urobilinogen: mg/dL (EU/dL)

Reference Interval:

<table>
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<td>Protein</td>
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<tr>
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Synonyms:
- UA
- Urine dipstick
- Urine pH
- Specific gravity, urine
- Urine hemoglobin
- Urine protein
- Urine glucose
- Urine nitrate
- Urine Leukocyte esterase
- Urine ketones
- Urine bilirubin
- Qualitative sugar, urine
- Urobilinogen

**Stability (from collection to initiation):**

2 hours at room temperature; 4 hours if refrigerated. For optimum results, the urine sample must be tested within 1-2 hours of collection, regardless of storage method.

**Reported:**

STAT 1 hour, Routine 2 hours

**Reflex Testing:**

Samples submitted with orders for Urinalysis with microscopic examination (UAWM) that are negative for Protein, Hemoglobin, Leukocyte esterase AND Ascorbic acid (Vit. C) will not be evaluated microscopically. The UAWM will be canceled and just the Macroscopic urinalysis (UA) will be charged.

Samples submitted with orders for Urine macroscopic only (UA) that are positive for ascorbic acid (Vit. C) but negative for hemoglobin will be evaluated microscopically to rule out the presence of red cells. The UA will be canceled and a Urinalysis with microscopic examination will be ordered and billed (See additional information)

**Additional Information:**

Urinalysis samples should be delivered as soon as possible after collection. Delayed transport of an unpreserved urine may lead to loss of red cell casts and other formed elements. Refrigeration of urine inhibits bacterial growth, but does not prevent the lytic effects of low specific gravity or alkaline pH. Urine crystal formation may be induced by refrigeration.

Note: Routine urinalysis in pediatric patients does not include testing for reducing substances, such as sugars galactose, lactose, fructose and maltose. If clinically indicated, this screening test for reducing substances may be ordered. Testing for congenital galactosemia is included in newborn screening programs in all 50 states in the U.S.

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</table>
ORDERING

Ordering Recommendations:
Order Urinalysis with reflex urin culture for most patients. The urine sample will be analyzed by urinalysis and set up for urine culture only if WBC > 4. Order Urine Culture with option for urinalysis restricted to high risk populations for patients meeting the following exception criteria:

- Pregnant women
- Positive point of care urinalysis
- Children < 24 months of age
- Neutropenic with ANC < 500 or anticipated to drop to < 500 in 24 hours
- Renal transplant within 3 months or needing augmented immunosuppression
- Inability to have inflammatory response in urinary tract due to immunocompromised state
- Patients undergoing urologic procedures in which mucosal bleeding is expected
- Suspected complete urinary tract obstruction
- Urine collected surgically

Stat Gram Stain can be performed for urines collected surgically as indicated by the order.

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Additional Information:
Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Sample Type:
Random urine

Collect:
- Urine cup (clean catch)
- Red top (indwelling catheter)

Amount to Collect:
See preferred volume

Preferred Volume:
10 mL urine

Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Urines collected surgically can have stat Gram Stain performed as indicated by the order. The physician can notify the laboratory to decline organism identification and susceptibility testing. See Utilization Guidelines below for ordering instructions.

Stability (from collection to initiation):
Refrigerated 24 hours
Unacceptable Conditions:
  More than one midstream or indwelling cath urine in 48 hours

PROCESSING

Test Code:
  P059
Test Group:
  Bacterial Culture
Performing Lab:
  Microbiology
Preferred Volume:
  10 mL urine
Unacceptable Conditions:
  More than one midstream or indwelling cath urine in 48 hours
Stability (from collection to initiation):
  Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information:
  Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents
  approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration
  of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

  Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

ADMINISTRATIVE

CPT Codes:
  87086 (culture & colony count), 87088 (Culture, Colony count, ID)
LOINC Codes:
  630-4

COMPLETE VIEW

Available Stat:
  No
Ordering Recommendations:
  Order Urinalysis with reflex urin culture for most patients. The urine sample will be analyzed by urinalysis and set up for urine culture
  only if WBC > 4. Order Urine Culture withoption for urinalysis restricted to high risk populations for patients meeting the following
  exception criteria:

  Pregnant women
  Positive point of care urinalysis
  Children < 24 months of age
  Neutropenic with ANC < 500 or anticipated to drop to < 500 in 24 hours
  Renal transplant within 3 months or needing augmented immunosuppression
  Inability to have inflammatory response in urinary tract due to immunocompromised state
  Patients undergoing urologic procedures in which mucosal bleeding is expected
  Suspected complete urinary tract obstruction
  Urine collected surgically

  Stat Gram Stain can be performed for urines collected surgically as indicated by the order.

Test Code:
  P059
Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Urines collected surgically can have stat Gram Stain performed as indicated by the order. The physician can notify the laboratory to decline organism identification and susceptibility testing. See Utilization Guidelines below for ordering instructions.

Collect:
Urine cup (clean catch)
Red top (indwelling catheter)

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Unacceptable Conditions:
More than one midstream or indwelling cath urine in 48 hours

Stability (from collection to initiation):
Refrigerated 24 hours

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

CPT Codes:
87086 (culture & colony count), 87088 (Culture, Colony count, ID)

LOINC Codes:
630-4
Urine Culture and Gram stain (restricted to surgical collection)  
P059S

ORDERING

Ordering Recommendations:
Urine collected surgically and Gram stain may be used to modify treatment (intra-op / post-op administration of antibiotics).

Urine Culture and Gram Stain is restricted to surgical collection, other patients should have Urinalysis with reflex to urine culture ordered.  See separate lab manual entry for Urine Culture.

Available Stat:
No (gram stain may be requested stat)

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Additional Information:
Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.

Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Sample Type:
Random urine

Collect:
Urine cup

Amount to Collect:
See preferred volume

Preferred Volume:
10 mL urine

Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Specify whether a Gram stain is desired. The physician can, by checking the appropriate box on the requisition, select a screening culture for significant numbers of a presumptive pathogen only and decline organism identification and susceptibility testing.

Stability (from collection to initiation):
Refrigerated 24 hours

Unacceptable Conditions:
More than one midstream or indwelling cath urine in 48 hours

PROCESSING

Test Code:
P059S

Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Preferred Volume:
10 mL urine

Unacceptable Conditions:
More than one midstream or indwelling cath urine in 48 hours

Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Reference Interval:
See Additional Information

Additional Information:
Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

ADMINISTRATIVE

CPT Codes:
87205; 87088

COMPLETE VIEW

Available Stat:
No (gram stain may be requested stat)

Ordering Recommendations:
Urine collected surgically and Gram stain may be used to modify treatment (intra-op / post-op administration of antibiotics).

Urine Culture and Gram Stain is restricted to surgical collection, other patients should have Urinalysis with reflex to urine culture ordered. See separate lab manual entry for Urine Culture.

Test Code:
P059S

Test Group:
Bacterial Culture

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Specify whether a Gram stain is desired. The physician can, by checking the appropriate box on the requisition, select a screening culture for significant numbers of a presumptive pathogen only and decline organism identification and susceptibility testing.

Collect:
Urine cup

Amount to Collect:
See preferred volume

Sample Type:
Random urine

Preferred Volume:
10 mL urine

Unacceptable Conditions:
More than one midstream or indwelling cath urine in 48 hours

**Reference Interval:**
- See Additional Information

**Stability (from collection to initiation):**
- Refrigerated 24 hours

**Reflex Testing:**
- If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed.
- Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

**Additional Information:**
- Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

- Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

**CPT Codes:**
- 87205; 87088
Urine culture from screening Urinalysis
P049

ORDERING

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Aerobic culture

Additional Information:
Urine samples will be tested by urinalysis with microscopy, and those not meeting criteria will have the urine culture canceled. Providers can indicate on the test order whether the patient meets exception from screening urinalysis (immunocompromised or pediatric patients), or if the urine is invasively collected. In these situations, urine culture will be performed without urinalysis, which must be ordered separately.

Screening Urinalysis criteria for setting up Urine Culture:
Urine sample contains at least trace amounts of protein, esterase or hemoglobin AND Urine sample is positive for > 5 WBC per hpf on microscopy

Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed. Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

COLLECTION

Collect:
Urine cup (clean catch)
Red top (indwelling catheter)

Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Specify whether a Gram stain is desired.

The physician can, by checking the appropriate box on the requisition, select a screening culture for significant numbers of a presumptive pathogen only and decline organism identification and susceptibility testing.

Stability (from collection to initiation):
Refrigerated 24 hours

Unacceptable Conditions:
More than one midstream or indwelling catheter urine in 48 hours

PROCESSING

Test Code:
P049

Test Group:
Bacterial culture

Performing Lab:
Microbiology

Unacceptable Conditions:
More than one midstream or indwelling catheter urine in 48 hours
Stability (from collection to initiation):
Refrigerated 24 hours

RESULT INTERPRETATION

Additional Information:
Urine samples will be tested by urinalysis with microscopy, and those not meeting criteria will have the urine culture canceled. Providers can indicate on the test order whether the patient meets exception from screening urinalysis (immunocompromised or pediatric patients), or if the urine is invasively collected. In these situations, urine culture will be performed without urinalysis, which must be ordered separately.

Screening Urinalysis criteria for setting up Urine Culture:
Urine sample contains at least trace amounts of protein, esterase or hemoglobin AND Urine sample is positive for > 5 WBC per hpf on microscopy

Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

ADMINISTRATIVE

CPT Codes:
87086 (culture & colony count), 87088 (Culture, Colony count, ID)
LOINC Codes:
630-4

COMPLETE VIEW

Test Code:
P049
Test Group:
Bacterial culture
Performing Lab:
Microbiology
Performed:
Set up daily, day and evening shifts
Methodology:
Aerobic culture
Remarks:
Submit voided urine in a cup with a screw-on lid. Use a Red top vacutainer to collect the specimen from a bladder catheter. Specify whether a Gram stain is desired.

The physician can, by checking the appropriate box on the requisition, select a screening culture for significant numbers of a presumptive pathogen only and decline organism identification and susceptibility testing.

Collect:
Urine cup (clean catch)
Red top (indwelling catheter)

Unacceptable Conditions:
More than one midstream or indwelling catheter urine in 48 hours
Stability (from collection to initiation):
Refrigerated 24 hours

Reflex Testing:
If bacteria are detected that are not normal mixed flora they are automatically identified and susceptibility testing is performed. Full ID and/or susceptibility testing may be omitted upon request when sample is submitted for testing.

Additional Information:
Urine samples will be tested by urinalysis with microscopy, and those not meeting criteria will have the urine culture canceled. Providers can indicate on the test order whether the patient meets exception from screening urinalysis (immunocompromised or pediatric patients), or if the urine is invasively collected. In these situations, urine culture will be performed without urinalysis, which must be ordered separately.

Screening Urinalysis criteria for setting up Urine Culture:
Urine sample contains at least trace amounts of protein, esterase or hemoglobin AND Urine sample is positive for > 5 WBC per hpf on microscopy

Colony counts are estimated based on the use of a calibrated 10 µl loop used to inoculate plates; each resultant colony represents approximately 100 CFU/mL. Therefore, an estimated colony count of 500 = 50,000 CFU/mL. It is important to note that the enumeration of colonies is only an estimate, particularly when the number of colonies on the plate exceeds 100 (10,000 CFU/mL).

Urine cultures showing positive results are retained for one week, should identification and/or susceptibility testing be desired.

CPT Codes:
87086 (culture & colony count), 87088 (Culture, Colony count, ID)

LOINC Codes:
630-4
UroVysion FISH
UROV

ORDERING

Ordering Recommendations:
May aid in diagnosis of urothelial carcinoma and monitoring for tumor recurrence.

Performing Lab:
ARUP

Performed:
Mon-Fri

Methodology:
Fluorescence in situ Hybridization/Computer Assisted Analysis/Microscopy

Reported:
4-12 days

Synonyms:
- Bladder Cancer
- Bladder Cancer FISH
- Bladder Tumor
- Bladder Tumor FISH
- Cytology
- FISH
- Urinary Tract Cancer
- Urothelial Carcinoma
- Urovysion

COLLECTION

Sample Type:
Urine

Collect:
Second-morning, clean-catch voided urine specimen in UroVysion FISH Collection Kit (ARUP Supply #41440) available online through eSupply using ARUP Connector contact Client Services at (800) 522-2787. For specific instructions refer to Specimen Collection & Handling.

Minimum Volume:
35 mL

Remarks:
Submit source information with the specimen.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 72 hours; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Specimens in inappropriate fixative. Specimens submitted in expired reagents.

PROCESSING

Test Code:
UROV

ARUP Test Code:
2001181

Sendout:
Performing Lab: ARUP

Specimen Preparation:
Transport the entire collection in the original collection kit. (Min: 35 mL)

Minimum Volume: 35 mL

Unacceptable Conditions:
Specimens in inappropriate fixative. Specimens submitted in expired reagents.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 72 hours; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
Negative: No evidence of numeric chromosomal aberrations associated with urothelial carcinoma identified.
Positive: Numeric chromosomal aberrations associated with urothelial carcinoma identified.

Interpretive Data:
Negative: Negative results indicate a lack of evidence for the presence of numeric chromosomal abnormalities commonly associated with urothelial carcinoma, within the cells collected in this specimen. Negative results in the presence of other symptoms/signs of urothelial carcinoma may suggest the possibility of a false-negative result. In this circumstance, additional clinical studies to exclude urothelial carcinoma should be pursued as clinically indicated. Although the UroVysion Kit was designed to detect genetic abnormality associated with most urothelial cancers, there will be some urothelial cancers for which genetic changes cannot be detected by the UroVysion Test.

Positive: Positive results indicate the presence of one or more numeric chromosomal abnormalities commonly associated with urothelial carcinoma, within the cells collected in this specimen. Positive results in the absence of clinical documentation of urothelial carcinoma within the bladder suggest the possibility of urothelial carcinoma or other urologic malignancy from another site (including ureter, kidney, urethra, and prostate). In this circumstance, further clinical evaluation to exclude these as a source of the abnormal cells is justified.

The UroVysion Bladder Cancer Kit (UroVysion Kit) is approved for use by the U.S. Food and Drug Administration.
Submit source information with the specimen.

Collect:
Second-morning, clean-catch voided urine specimen in UroVysion FISH Collection Kit (ARUP Supply #41440) available online through eSupply using ARUP Connector contact Client Services at (800) 522-2787. For specific instructions refer to Specimen Collection & Handling.

Sample Type:
Urine

Minimum Volume:
35 mL

Unacceptable Conditions:
Specimens in inappropriate fixative. Specimens submitted in expired reagents.

Specimen Preparation:
Transport the entire collection in the original collection kit. (Min: 35 mL)

Reference Interval:
Negative: No evidence of numeric chromosomal aberrations associated with urothelial carcinoma identified.
Positive: Numeric chromosomal aberrations associated with urothelial carcinoma identified.

Interpretive Data:
Negative: Negative results indicate a lack of evidence for the presence of numeric chromosomal abnormalities commonly associated with urothelial carcinoma, within the cells collected in this specimen. Negative results in the presence of other symptoms/signs of urothelial carcinoma may suggest the possibility of a false-negative result. In this circumstance, additional clinical studies to exclude urothelial carcinoma should be pursued as clinically indicated. Although the UroVysion Kit was designed to detect genetic abnormality associated with most urothelial cancers, there will be some urothelial cancers for which genetic changes cannot be detected by the UroVysion Test.

Positive: Positive results indicate the presence of one or more numeric chromosomal abnormalities commonly associated with urothelial carcinoma, within the cells collected in this specimen. Positive results in the absence of clinical documentation of urothelial carcinoma within the bladder suggest the possibility of urothelial carcinoma or other urologic malignancy from another site (including ureter, kidney, urethra, and prostate). In this circumstance, further clinical evaluation to exclude these as a source of the abnormal cells is justified.

The UroVysion Bladder Cancer Kit (UroVysion Kit) is approved for use by the U.S. Food and Drug Administration.

Synonyms:
- Bladder Cancer
- Bladder Cancer FISH
- Bladder Tumor
- Bladder Tumor FISH
- Cytology
- FISH
- Urinary Tract Cancer
- Urothelial Carcinoma
- Urovysion

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: Unacceptable; Refrigerated: 72 hours; Frozen: Unacceptable

Reported:
4-12 days

CPT Codes:
88121; if manual 88120
Vaginal smear for Bacterial vaginosis/yeast

P058

ORDERING

Available Stat: No
Performing Lab: Mirobiology
Performed: Daily, day and evening shifts only
Methodology: Gram stain and microscopy
Reported: Same or next day
Additional Information:
Use of a scored Gram stain (Nugent score) to demonstrate whether there has been a shift in the vaginal flora from predominantly gram-positive Lactobacillus to a gram-negative flora is recommended for diagnosis of BV, rather than culture for Gardnerella vaginalis or other organism(s).

The primary reason for performing a Gram stain on vaginal secretions is to diagnose bacterial vaginosis, therefore, this test will be performed if a Gram stain is ordered.

The presence or absence of yeast, presence or absence of Clue cells, and Nugent score is reported.

Nugent score >= 7, or Clue cells with Nugent score >= 4, is consistent with the clinical diagnosis of bacterial vaginosis.

Synonyms:
- BV
- clue cells
- G. vaginalis
- Gardnerella vaginalis

COLLECTION

Sample Type: Vaginal discharge
Collect: Glass slides or swab in Amies Transport Media with charcoal
Amount to Collect: 2 smeared slides or single swab
Preferred Volume: 2 smeared slides or single swab
Remarks: Prepare thin smears of vaginal discharge on 2 slides, or collect swab in Amies charcoal transport medium with charcoal.
Stability (from collection to initiation):
- Swabs: Room temperature 12 hours
- Slides: Indefinitely

PROCESSING

Test Code: P058
Performing Lab: Mirobiology

Printed 06/07/19
Test information subject to change
Preferred Volume:
2 smeared slides or single swab

Stability (from collection to initiation):
Swabs: Room temperature 12 hours
Slides: Indefinitely

RESULT INTERPRETATION

Units:
Nugent score

Reference Interval:
Nugent score < 7 without Clue cells or Nugent score < 4 if Clue cells present

Additional Information:
Use of a scored Gram stain (Nugent score) to demonstrate whether there has been a shift in the vaginal flora from predominantly gram-positive Lactobacillus to a gram-negative flora is recommended for diagnosis of BV, rather than culture for Gardnerella vaginalis or other organism(s).

The primary reason for performing a Gram stain on vaginal secretions is to diagnose bacterial vaginosis, therefore, this test will be performed if a Gram stain is ordered.

The presence or absence of yeast, presence or absence of Clue cells, and Nugent score is reported.

Nugent score >= 7, or Clue cells with Nugent score >= 4, is consistent with the clinical diagnosis of bacterial vaginosis.

ADMINISTRATIVE

CPT Codes:
87205

COMPLETE VIEW

Available Stat:
No

Test Code:
P058

Performing Lab:
Mirobiology

Performed:
Daily, day and evening shifts only

Methodology:
Gram stain and microscopy

Remarks:
Prepare thin smears of vaginal discharge on 2 slides, or collect swab in Amies charcoal transport medium with charcoal.

Collect:
Glass slides or swab in Amies Transport Media with charcoal

Amount to Collect:
2 smeared slides or single swab

Sample Type:
Vaginal discharge

Preferred Volume:
2 smeared slides or single swab

Units:
Nugent score

Reference Interval:
Nugent score < 7 without Clue cells or Nugent score < 4 if Clue cells present

Synonyms:
- BV
- clue cells
- G. vaginalis
- Gardnerella vaginalis

**Stability (from collection to initiation):**
- Swabs: Room temperature 12 hours
- Slides: Indefinitely

**Reported:**
- Same or next day

**Additional Information:**
Use of a scored Gram stain (Nugent score) to demonstrate whether there has been a shift in the vaginal flora from predominantly gram-positive Lactobacillus to a gram-negative flora is recommended for diagnosis of BV, rather than culture for Gardnerella vaginalis or other organism(s).

The primary reason for performing a Gram stain on vaginal secretions is to diagnose bacterial vaginosis, therefore, this test will be performed if a Gram stain is ordered.

The presence or absence of yeast, presence or absence of Clue cells, and Nugent score is reported.

Nugent score $\geq 7$, or Clue cells with Nugent score $\geq 4$, is consistent with the clinical diagnosis of bacterial vaginosis.

**CPT Codes:**
- 87205
Valproic acid
VALP

ORDERING

Available Stat: Yes
Performing Lab: Parnassus & Mission Bay Chemistry
Performed: Test available 24 hours per day 7 days per week
Methodology: Turbidimetric inhibition immunoassay (Beckman DxC800)
Reported: Stat 1 hour, Routine 4 hours
Additional Information: See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.
Synonyms: • Depakene • Valproate • Depakote

COLLECTION

Sample Type: Serum or plasma
Collect: Gold top or Light Green top
Amount to Collect: 1 mL blood
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Remarks: Time to steady state: 2-3 days.
Collect trough samples 30 minutes before next dose.
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week

PROCESSING

Test Code: VALP
Performing Lab: Parnassus & Mission Bay Chemistry
Preferred Volume: 0.5 mL serum or plasma
Minimum Volume: 0.2 mL serum or plasma
Stability (from collection to initiation): Room temperature 8 hours, refrigerated 2 days, frozen at -20C 1 week
**RESULT INTERPRETATION**

**Units:**
- mg/L

**Reference Interval:**
- Therapeutic: 50-125 mg/L


**Critical Values:**
- >150 mg/L

**Additional Information:**
See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**ADMINISTRATIVE**

**CPT Codes:**
- 80164

**LOINC Codes:**
- 4086-5

**COMPLETE VIEW**

**Available Stat:**
- Yes

**Test Code:**
- VALP

**Performing Lab:**
- Parnassus & Mission Bay Chemistry

**Performed:**
- Test available 24 hours per day 7 days per week

**Methodology:**
- Turbidimetric inhibition immunoassay (Beckman DxC800)

**Remarks:**
- Time to steady state: 2-3 days.

**Collect:**
- Gold top or Light Green top

**Amount to Collect:**
- 1 mL blood

**Sample Type:**
- Serum or plasma

**Preferred Volume:**
- 0.5 mL serum or plasma

**Minimum Volume:**
- 0.2 mL serum or plasma

**Units:**
- mg/L

**Reference Interval:**
- Therapeutic: 50-125 mg/L

August 2012.

**Critical Values:**

>150 mg/L

**Synonyms:**

- Depakene
- Valproate
- Depakote

**Stability (from collection to initiation):**

Room temperature 8 hours, refrigerated 2 days, frozen at -20°C 1 week

**Reported:**

- Stat 1 hour, Routine 4 hours

**Additional Information:**

See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

**CPT Codes:**

- 80164

**LOINC Codes:**

- 4086-5
Vancomycin
VANC

ORDERING

Ordering Recommendations:

VANCOMYCIN TROUGH MONITORING

Vancomycin troughs are not recommended in patients in whom anticipated duration of therapy is short (<= 3 days)

Only trough levels should be obtained. Vancomycin peaks have no clinical significance. Trough levels should be obtained within 30 minutes before 4th dose of a new regimen or dosage change.

INDICATIONS FOR VANCOMYCIN TROUGHs

Patients with unstable renal function or when serum Cr may not accurately reflect GFR i.e. patients > 70, reduced muscle mass (e.g. malnutrition, prolonged hospitalization, amputees, etc.)

Patients on continuous or intermittent hemodialysis (for intermittent HD draw a pre-dialysis level)

Patients with severely altered volumes of distribution (e.g. morbid obesity, significant edema, burns)

Initial and definitive therapy of suspected central nervous system infections, endocarditis, ventilator-associated pneumonia, bacteremia or ostemyelitis caused by MRSA.

FREQUENCY OF VANCOMYCIN TROUGHS

Once weekly monitoring is reasonable in patients with stable renal function. (Data supporting safety of prolonged troughs of 15-20 mcg/ml is limited.)

Available Stat:
No

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days a week

Methodology:
Turbidimetric inhibition immunoassay (Beckman DxC800)

Reported:
1 day

Additional Information:

Only a trough sample is recommended. If a peak level is deemed necessary, obtain the sample 60 min. after the end of the infusion.

Peak levels in the range of 30 - 40 mg/L may be expected with usual dosing. Toxicity may occur with vancomycin levels > 80 mg/L.

Therapeutic trough 10-20 mg/L recommended typically. However, for patients with serious MRSA infections (central nervous system infections, endocarditis, ventilator-associated pneumonia, bacteremia or ostemyelitis) trough levels of 15-20 mg/mL and ID consult are recommended.

Note: some monoclonal proteins may cause falsely low vancomycin results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the vancomycin assay in some cases. Testing for vancomycin levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

Synonyms:
• Vancocin

COLLECTION

Sample Type:
Serum or plasma

**Collect:**
Gold top or Light Green top

**Amount to Collect:**
1 mL blood

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

**Remarks:**
Time to steady state: 3 doses

Collect trough samples <= 30 minutes prior to 4th or subsequent dose. For patients on hemodialysis collect prior to dialysis.

Note exact time of collection on requisition AND sample.

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**PROCESSING**

**Test Code:**
VANC

**Performing Lab:**
Parnassus & Mission Bay Chemistry

**Specimen Preparation:**
Refrigerate serum.

**Preferred Volume:**
0.5 mL serum or plasma

**Minimum Volume:**
0.2 mL serum or plasma

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**RESULT INTERPRETATION**

**Units:**
mg/L

**Reference Interval:**
Therapeutic trough, standard cases: 10-20 mg/L
Therapeutic trough, exceptional cases: 15-20 mg/L

Source of reference range: UCSF/SFGH/VASF joint guidelines for antimicrobial use in adults. [Click here for link]

**Additional Information:**
Only a trough sample is recommended. If a peak level is deemed necessary, obtain the sample 60 min. after the end of the infusion.

Peak levels in the range of 30 - 40 mg/L may be expected with usual dosing. Toxicity may occur with vancomycin levels > 80 mg/L.

Therapeutic trough 10-20 mg/L recommended typically. However, for patients with serious MRSA infections (central nervous system infections, endocarditis, ventilator-associated pneumonia, bacteremia or osteomyelitis) trough levels of 15-20 mg/mL and ID consult are recommended.

**Note:** some monoclonal proteins may cause falsely low vancomycin results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the vancomycin assay in some cases. Testing for vancomycin levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

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**ADMINISTRATIVE**

**CPT Codes:**
80202

**LOINC Codes:**
Available Stat:
No

Ordering Recommendations:
VANCOMYCIN TROUGH MONITORING
Vancomycin troughs are not recommended in patients in whom anticipated duration of therapy is short (<= 3 days)

Only trough levels should be obtained. Vancomycin peaks have no clinical significance. Trough levels should be obtained within 30 minutes before 4th dose of a new regimen or dosage change.

INDICATIONS FOR VANCOMYCIN TROUGHS
Patients with unstable renal function or when serum Cr may not accurately reflect GFR i.e. patients > 70, reduced muscle mass (e.g. malnutrition, prolonged hospitalization, amputees, etc.)

Patients on continuous or intermittent hemodialysis (for intermittent HD draw a pre-dialysis level)

Patients with severely altered volumes of distribution (e.g. morbid obesity, significant edema, burns)

Initial and definitive therapy of suspected central nervous system infections, endocarditis, ventilator-associated pneumonia, bacteremia or osteomyelitis caused by MRSA.

FREQUENCY OF VANCOMYCIN TROUGHS
Once weekly monitoring is reasonable in patients with stable renal function. (Data supporting safety of prolonged troughs of 15-20 mcg/ml is limited.)

Test Code:
VANC

Performing Lab:
Parnassus & Mission Bay Chemistry

Performed:
Test available 24 hours per day 7 days a week

Methodology:
Turbidimetric inhibition immunoassay (Beckman DxC800)

Remarks:
Time to steady state: 3 doses

Collect trough samples <= 30 minutes prior to 4th or subsequent dose. For patients on hemodialysis collect prior to dialysis.

Note exact time of collection on requisition AND sample.

Collect:
Gold top or Light Green top

Amount to Collect:
1 mL blood

Sample Type:
Serum or plasma

Preferred Volume:
0.5 mL serum or plasma

Minimum Volume:
0.2 mL serum or plasma

Specimen Preparation:
Refrigerate serum.

Units:
mg/L
Reference Interval:

Therapeutic trough, standard cases: 10-20 mg/L
Therapeutic trough, exceptional cases: 15-20 mg/L

Source of reference range: UCSF/SFGH/VASF joint guidelines for antimicrobial use in adults. Click here for link

Synonyms:

- Vancocin

Reported:

1 day

Additional Information:

Only a trough sample is recommended. If a peak level is deemed necessary, obtain the sample 60 min. after the end of the infusion.

Peak levels in the range of 30 - 40 mg/L may be expected with usual dosing. Toxicity may occur with vancomycin levels > 80 mg/L.

Therapeutic trough 10-20 mg/L recommended typically. However, for patients with serious MRSA infections (central nervous system infections, endocarditis, ventilator-associated pneumonia, bacteremia or osteomyelitis) trough levels of 15-20 mg/mL and ID consult are recommended.

Note: some monoclonal proteins may cause falsely low vancomycin results. The presence of human anti-mouse antibodies or heterophile antibodies may also interfere with the vancomycin assay in some cases. Testing for vancomycin levels in parallel dilution studies and with a different assay may be useful in cases where interference by a monoclonal protein or abnormal immunoglobulin is suspected. See the lab manual's "A Guide on Drug Level Monitoring" (in the Chemistry Guide) for additional information.

CPT Codes:

80202

LOINC Codes:

4092-3
Vanillylmandelic Acid, urine
VMA

ORDERING

Available Stat: No
Performing Lab: China Basin Chemistry
Performed: Tuesday, Friday (day shift)
Methodology: HPLC
Reported: 1-4 days
Additional Information:
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

A creatinine is automatically run and separately billed on each sample.

Synonyms: • VMA

COLLECTION

Sample Type: 24 hour urine collection or random urine
Collect: 24 hour urine collection container or urine cup
Amount to Collect: Entire 24 hour urine output or random urine (See preferred volume)
Preferred Volume: 5 mL urine
Stability (from collection to initiation):
Samples without preservative are stable at room temperature for 5 days.

PROCESSING

Test Code: VMA
Performing Lab: China Basin Chemistry
Specimen Preparation: Aliquot 5 mL.
Preferred Volume: 5 mL urine
Stability (from collection to initiation):
Samples without preservative are stable at room temperature for 5 days.

RESULT INTERPRETATION

Units: mg/g Creatinine
Reference Interval: 
1-12 months <36 mg/g Creatinine
1-2 years  <31 mg/g Creatinine
2-5 years  <17 mg/g Creatinine
5-10 years <15 mg/g Creatinine
> 10 years  <11 mg/g Creatinine

Additional Information:
This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

A creatinine is automatically run and separately billed on each sample.

ADMINISTRATIVE

CPT Codes:
84585
LDT or Modified FDA:
Yes
LOINC Codes:
30571-4

COMPLETE VIEW

Available Stat:
No
Test Code:
VMA
Performing Lab:
China Basin Chemistry
Performed:
Tuesday, Friday (day shift)
Methodology:
HPLC
Collect:
24 hour urine collection container or urine cup
Amount to Collect:
Entire 24 hour urine output or random urine (See preferred volume)
Sample Type:
24 hour urine collection or random urine
Preferred Volume:
5 mL urine
Specimen Preparation:
Aliquot 5 mL.
Units:
mg/g Creatinine
Reference Interval:
1-12 months <36 mg/g Creatinine
1-2 years  <31 mg/g Creatinine
2-5 years  <17 mg/g Creatinine
5-10 years <15 mg/g Creatinine
> 10 years  <11 mg/g Creatinine

Synonyms:
• VMA

Stability (from collection to initiation):
Samples without preservative are stable at room temperature for 5 days.
Reported:
Additional Information:

This test was developed and its performance characteristics determined by the Clinical Laboratories at the Medical Center at UC San Francisco. It has not been cleared or approved by the U.S. Food and Drug Administration.

A creatinine is automatically run and separately billed on each sample.

CPT Codes:
84585

LDT or Modified FDA:
Yes

LOINC Codes:
30571-4
Varicella zoster virus Antibody, IgG serum
VZI

ORDERING

Available Stat: No
Performing Lab: Immunology
Performed: Monday-Friday (day shift)
Methodology: Chemiluminescent Immunoassay
Reported: 1-4 days
Additional Information:
Results are reported as 'Positive', 'Negative', or Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

Note: Treatment with Zoster immune globulin will result in a positive test result that will not reflect the patient's own immune reaction.
See also entries for Viral Culture and Viral Serology.
Synonyms:
- VZ
- VZV

COLLECTION

Sample Type: Serum
Collect: Gold top
Amount to Collect:
1 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.2 mL serum
Remarks:
Contact the laboratory (415-353-1712) if results are needed urgently to determine VZIG therapy of immunocompromised or pregnant patients.
Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

PROCESSING

Test Code: VZI
Test Group: Varicella-zoster
Performing Lab: Immunology
Specimen Preparation:
Freeze sample at -20 C
Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

RESULT INTERPRETATION

Reference Interval:
Negative/Not Immune: < 135.0
Equivocal: 135.0-164.9
Positive/Immune: > 164.9

Additional Information:
Results are reported as 'Positive', 'Negative', or 'Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

Note: Treatment with Zoster immune globulin will result in a positive test result that will not reflect the patient's own immune reaction.

See also entries for Viral Culture and Viral Serology.

ADMINISTRATIVE

CPT Codes:
86787

LOINC Codes:
15410-4

COMPLETE VIEW

Available Stat:
No

Test Code:
VZI

Test Group:
Varicella-zoster

Performing Lab:
Immunology

Performed:
Monday-Friday (day shift)

Methodology:
Chemiluminescent Immunoassay

Remarks:
Contact the laboratory (415-353-1712) if results are needed urgently to determine VZIG therapy of immunocompromised or pregnant patients.

Collect:
Gold top

Amount to Collect:
1 mL blood

Sample Type:
Serum

Preferred Volume:
0.5 mL serum

Minimum Volume:
0.2 mL serum

Unacceptable Conditions:
Grossly hemolyzed, lipemic or icteric samples

**Specimen Preparation:**
Freeze sample at -20 C

**Reference Interval:**
- Negative/Not Immune: < 135.0
- Equivocal: 135.0-164.9
- Positive/Immune: > 164.9

**Synonyms:**
- VZ
- VZV

**Reported:**
1-4 days

**Additional Information:**
Results are reported as 'Positive', 'Negative', or Equivocal'. Equivocal results may represent low-titer antibody; testing may be repeated, if clinically indicated.

**Note:** Treatment with Zoster immune globulin will result in a positive test result that will not reflect the patient's own immune reaction.

See also entries for Viral Culture and Viral Serology.

**CPT Codes:**
- 86787

**LOINC Codes:**
- 15410-4
Varicella zoster virus Antigen (DFA)
P346

ORDERING

Ordering Recommendations:
Vessicular skin lesion suspected of being varicella (Chicken Pox) or zoster (shingles) should be diagnosed by immunofluorescent assay rather than culture.

Approval Required:
Yes, contact Microbiology at x3-1268 for testing samples types not listed

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Daily, day shift only

Methodology:
Direct immunofluorescent assay

Reported:
Same or next day

Additional Information:
DFA is more sensitive than culture for VZV and is the method of choice, except PCR is more sensitive for CSF and vitreous fluid.

Synonyms:
- VZ
- VZV
- VZV Ag
- VZV antigen
- Varicella-zoster Ag
- Varicella-zoster antigen

COLLECTION

Sample Type:
Eye, pustule or vesicle, tissue (see collection instructions)

Collect:
Glass slide x2 for smears, viral holding medium for tissue biopsies.

Amount to Collect:
Eye, pustule or vesicle: Two slides, each with two cell spots, Tissue: 5 cu. mm

Preferred Volume:
Eye, pustule or vesicle: Two slides, each with two cell spots, Tissue: 5 cu. mm

Minimum Volume:
Eye, pustule or vesicle: One slide with two cell spots, Tissue: 2 cu. mm

Remarks:
Each slide should contain two spots of cells obtained from the base of an intact vesicle with a scalpel blade or swab. These spots should be approximately 1.5 cm in diameter (the size of a dime). Allow material on slide to air dry.

Stability (from collection to initiation):
Slides once prepared are stable at room temperature for 24 hours. For more prolonged stability, fix smears in acetone and freeze them at -70C.

Unacceptable Conditions:
Improperly collected sample. Unsuitable sample types. Swab samples are not acceptable.

PROCESSING

Printed 06/07/19
Test information subject to change
Test Code: P346
Test Group: Varicella-zoster
Performing Lab: Microbiology

Specimen Preparation:
Prepare two touch prep smears from tissue. Make a fresh cut of tissue and touch it to the slides. Give to Virology to make smears if swab in viral holding media is received.

Preferred Volume:
Eye, pustule or vesicle: Two slides, each with two cell spots, Tissue: 5 cu. mm
Minimum Volume:
Eye, pustule or vesicle: One slide with two cell spots, Tissue: 2 cu. mm

Unacceptable Conditions:
Improperly collected sample. Unsuitable sample types. Swab samples are not acceptable.

Stability (from collection to initiation):
Slides once prepared are stable at room temperature for 24 hours. For more prolonged stability, fix smears in acetone and freeze them at -70°C.

RESULT INTERPRETATION

Reference Interval:
Negative

Critical Values:
Positive result from inpatient or patient currently in the ED.

Additional Information:
DFA is more sensitive than culture for VZV and is the method of choice, except PCR is more sensitive for CSF and vitreous fluid.

ADMINISTRATIVE

CPT Codes:
87290
LOINC Codes:
5882-6

COMPLETE VIEW

Approval Required:
Yes, contact Microbiology at x3-1268 for testing samples types not listed

Available Stat:
No

Ordering Recommendations:
Vesicular skin lesion suspected of being varicella (Chicken Pox) or zoster (shingles) should be diagnosed by immunofluorescent assay rather than culture.

Test Code:
P346
Test Group:
Varicella-zoster
Performing Lab:
Microbiology

Performed:
Daily, day shift only

Methodology:
Direct immunofluorescent assay

Remarks:
Each slide should contain two spots of cells obtained from the base of an intact vesicle with a scalpel blade or swab. These spots should be approximately 1.5 cm in diameter (the size of a dime). Allow material on slide to air dry.

**Collect:**
- Glass slide x2 for smears, viral holding medium for tissue biopsies.

**Amount to Collect:**
- Eye, pustule or vesicle: Two slides, each with two cell spots, Tissue: 5 cu. mm

**Sample Type:**
- Eye, pustule or vesicle, tissue (see collection instructions)

**Preferred Volume:**
- Eye, pustule or vesicle: Two slides, each with two cell spots, Tissue: 5 cu. mm

**Minimum Volume:**
- Eye, pustule or vesicle: One slide with two cell spots, Tissue: 2 cu. mm

**Unacceptable Conditions:**
- Improperly collected sample. Unsuitable sample types. Swab samples are not acceptable.

**Specimen Preparation:**
- Prepare two touch prep smears from tissue. Make a fresh cut of tissue and touch it to the slides. Give to Virology to make smears if swab in viral holding media is received.

**Reference Interval:**
- Negative

**Critical Values:**
- Positive result from inpatient or patient currently in the ED.

**Synonyms:**
- VZ
- VZV
- VZV Ag
- VZV antigen
- Varicella-zoster Ag
- Varicella-zoster antigen

**Stability (from collection to initiation):**
- Slides once prepared are stable at room temperature for 24 hours. For more prolonged stability, fix smears in acetone and freeze them at -70C.

**Reported:**
- Same or next day

**Additional Information:**
- DFA is more sensitive than culture for VZV and is the method of choice, except PCR is more sensitive for CSF and vitreous fluid.

**CPT Codes:**
- 87290

**LOINC Codes:**
- 5882-6
Varicella zoster virus DNA
P339

ORDERING

Available Stat:
No
Performing Lab:
Viracor
Methodology:
Quantitative Real Time PCR
Reported:
2-5 days.
Additional Information:
Useful for the diagnosis of encephalitis in lieu of brain biopsy. PCR on CSF is highly sensitive, where as culture is often negative.
Assay range: 100-1.0x10^8 copies/mL
Synonyms:
- VZV PCR

COLLECTION

Sample Type:
CSF, EDTA plasma
Collect:
CSF: CSF tube or sterile collection tube
Blood: Lavender top
Amount to Collect:
CSF: 1 mL
EDTA whole blood: 3 mL
Preferred Volume:
CSF: 1 mL
Plasma: 1 mL
Minimum Volume:
CSF: 0.5 mL
Plasma: 0.5 mL
Stability (from collection to initiation):
CSF: Frozen at -70°C 1 month
Blood/plasma: Room temperature 4 days, plasma frozen at -70°C 1 month

PROCESSING

Test Code:
P339
Test Group:
Varicella-zoster
Sendout:
Yes
Performing Lab:
Viracor
Specimen Preparation:
CSF: Store at -70°C and ship frozen, on dry ice, in a sterile, leak proof tube.
Blood: Centrifuge blood, remove plasma, and freeze at -70C.
Order Viracor test: VZV Real Time qPCR #9500

**Preferred Volume:**
- CSF: 1 mL
- Plasma: 1 mL

**Minimum Volume:**
- CSF: 0.5 mL
- Plasma: 0.5 mL

**Stability (from collection to initiation):**
- CSF: Frozen at -70°C 1 month
- Blood/plasma: Room temperature 4 days, plasma frozen at -70°C 1 month

---

**RESULT INTERPRETATION**

**Reference Interval:**
Not detected

**Critical Values:**
VZV from CSF

**Additional Information:**
Useful for the diagnosis of encephalitis in lieu of brain biopsy. PCR on CSF is highly sensitive, where as culture is often negative.

Assay range: 100-1.0×10^8 copies/mL

---

**ADMINISTRATIVE**

**CPT Codes:**
- 87799-90

**LOINC Codes:**
- 47003-9

---

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- P339

**Test Group:**
- Varicella-zoster

**Performing Lab:**
- Viracor

**Sendout:**
- Yes

**Methodology:**
- Quantitative Real Time PCR

**Collect:**
- CSF: CSF tube or sterile collection tube
- Blood: Lavender top

**Amount to Collect:**
- CSF: 1 mL
- EDTA whole blood: 3 mL

**Sample Type:**
- CSF, EDTA plasma

**Preferred Volume:**
- CSF: 1 mL
- Plasma: 1 mL

**Minimum Volume:**
- CSF: 0.5 mL
Plasma: 0.5 mL

**Specimen Preparation:**
- CSF: Store at -70°C and ship frozen, on dry ice, in a sterile, leak proof tube.
- Blood: Centrifuge blood, remove plasma, and freeze at -70°C.

Order Viracor test: VZV Real Time qPCR #9500

**Reference Interval:**
- Not detected

**Critical Values:**
- VZV from CSF

**Synonyms:**
- VZV PCR

**Stability (from collection to initiation):**
- CSF: Frozen at -70°C 1 month
- Blood/plasma: Room temperature 4 days, plasma frozen at -70°C 1 month

**Reported:**
- 2-5 days.

**Additional Information:**
- Useful for the diagnosis of encephalitis in lieu of brain biopsy. PCR on CSF is highly sensitive, where as culture is often negative.

- Assay range: 100-1.0x10^8 copies/mL

**CPT Codes:**
- 87799-90

**LOINC Codes:**
- 47003-9
Varicella-Zoster Virus Antibody, IgG, CSF
VZGC

ORDERING

Ordering Recommendations:
Generally not recommended for the diagnosis of acute disease/encephalitis. May aid in diagnosing varicella-zoster virus vasculopathy.
Performing Lab:
ARUP
Performed:
Sun - Sat
Methodology:
Semi-Quantitative Chemiluminescent Immunoassay
Reported:
Within 24 hours
Synonyms:
• CSF VZV
• Herpes Zoster Antibodies CSF
• Varicella-Zoster Antibody CSF
• Varicella-zoster IgG CSF
• VZ AB IgG CSF
• VZ Ab, CSF

COLLECTION

Collect:
CSF.
Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year
Storage/Transport Temperature:
Refrigerated. Also acceptable: Frozen.
Unacceptable Conditions:
Contaminated, heat-inactivated, hemolyzed, or xanthochromic specimens.

PROCESSING

Test Code:
VZGC
ARUP Test Code:
0054444
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.3 mL)
Unacceptable Conditions:
Contaminated, heat-inactivated, hemolyzed, or xanthochromic specimens.
Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year
Storage/Transport Temperature:
Refrigerated. Also acceptable: Frozen.
RESULT INTERPRETATION

Reference Interval:

Effective August 20, 2012

<table>
<thead>
<tr>
<th>Range</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>134 IV or less</td>
<td>Negative - No significant level of IgG antibody to varicella-zoster virus detected.</td>
</tr>
<tr>
<td>135-165 IV</td>
<td>Equivocal - Repeat testing in 10-14 days may be helpful.</td>
</tr>
<tr>
<td>166 IV or greater</td>
<td>Positive - IgG antibody to varicella-zoster virus detected, which may indicate a current or past varicella-zoster infection.</td>
</tr>
</tbody>
</table>

Interpretive Data:

The detection of antibodies to varicella-zoster in CSF may indicate central nervous system infection. However, consideration must be given to possible contamination by blood or transfer of serum antibodies across the blood-brain barrier.

ADMINISTRATIVE

CPT Codes:

86787

COMPLETE VIEW

Ordering Recommendations:

Generally not recommended for the diagnosis of acute disease/encephalitis. May aid in diagnosing varicella-zoster virus vasculopathy.

Test Code:

VZGC

ARUP Test Code:

0054444

Performing Lab:

ARUP

Sendout:

Yes

Performed:

Sun - Sat

Methodology:

Semi-Quantitative Chemiluminescent Immunoassay

Collect:

CSF.

Unacceptable Conditions:

Contaminated, heat-inactivated, hemolyzed, or xanthochromic specimens.

Specimen Preparation:

Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.3 mL)

Reference Interval:

Effective August 20, 2012

<table>
<thead>
<tr>
<th>Range</th>
<th>Interpretation</th>
</tr>
</thead>
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<tr>
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<td>166 IV or greater</td>
<td>Positive - IgG antibody to varicella-zoster virus detected, which may indicate a current or past varicella-zoster infection.</td>
</tr>
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</table>

Interpretive Data:

The detection of antibodies to varicella-zoster in CSF may indicate central nervous system infection. However, consideration must be given to possible contamination by blood or transfer of serum antibodies across the blood-brain barrier.

Synonyms:

- CSF VZV
- Herpes Zoster Antibodies CSF
- Varicella-Zoster Antibody CSF
• Varicella-zoster IgG CSF
• VZ AB IgG CSF
• VZ Ab, CSF

Storage/Transport Temperature:
Refrigerated. Also acceptable: Frozen.

Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year

Reported:
Within 24 hours

CPT Codes:
86787
Varicella-Zoster Virus Antibody, IgM by ELISA (CSF)
VZMC

ORDERING

Ordering Recommendations:
Not recommended. Refer to Varicella-Zoster Virus by PCR (0060042) or Meningitis/Encephalitis Panel by PCR (2013305).
Performing Lab:
ARUP
Performed:
Mon-Fri
Methodology:
Semi-Quantitative Enzyme-Linked Immunosorbent Assay
Reported:
1-5 days
Synonyms:
- Herpes Zoster
- Varicella Zoster Virus CSF IgM
- VZV CSF IgM

COLLECTION

Collect:
CSF.
Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year
Storage/Transport Temperature:
Refrigerated.
Unacceptable Conditions:
Specimen types other than CSF. Contaminated, heat-inactivated, or hemolyzed specimens.

PROCESSING

Test Code:
VZMC
ARUP Test Code:
0054445
Sendout:
Yes
Performing Lab:
ARUP
Specimen Preparation:
Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.3 mL)
Unacceptable Conditions:
Specimen types other than CSF. Contaminated, heat-inactivated, or hemolyzed specimens.
Stability (from collection to initiation):
Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year
Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:

Printed 06/07/19
Test information subject to change
<table>
<thead>
<tr>
<th>ISR</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.90</td>
<td>Negative - No significant level of IgM antibody to varicella-zoster virus detected.</td>
</tr>
<tr>
<td>0.91-1.09</td>
<td>Equivocal - Repeat testing in 10-14 days may be helpful.</td>
</tr>
<tr>
<td>&gt; 1.10</td>
<td>Positive - Significant level of IgM antibody to varicella-zoster virus detected, which may indicate current or recent infection. However, low levels of IgM antibodies may occasionally persist for more than 12 months post-infection.</td>
</tr>
</tbody>
</table>

**Interpretive Data:**
The detection of antibodies to varicella-zoster in CSF may indicate central nervous system infection. However, consideration must be given to possible contamination by blood or transfer of serum antibodies across the blood-brain barrier.

**ADMINISTRATIVE**

**CPT Codes:**
86787

**COMPLETE VIEW**

**Ordering Recommendations:**
Not recommended. Refer to Varicella-Zoster Virus by PCR (0060042) or Meningitis/Encephalitis Panel by PCR (2013305).

**Test Code:**
VZMC

**ARUP Test Code:**
0054445

**Performing Lab:**
ARUP

**Sendout:**
Yes

**Performed:**
Mon-Fri

**Methodology:**
Semi-Quantitative Enzyme-Linked Immunosorbent Assay

**Collect:**
CSF.

**Unacceptable Conditions:**
Specimen types other than CSF. Contaminated, heat-inactivated, or hemolyzed specimens.

**Specimen Preparation:**
Transfer 0.5 mL CSF to an ARUP Standard Transport Tube. (Min: 0.3 mL)

**Reference Interval:**

<table>
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**Interpretive Data:**
The detection of antibodies to varicella-zoster in CSF may indicate central nervous system infection. However, consideration must be given to possible contamination by blood or transfer of serum antibodies across the blood-brain barrier.

**Synonyms:**
- Herpes Zoster
- Varicella Zoster Virus CSF IgM
- VZV CSF IgM
Storage/Transport Temperature:
  Refrigerated.

Stability (from collection to initiation):
  Ambient: 8 hours; Refrigerated: 2 weeks; Frozen: 1 year

Reported:
  1-5 days

CPT Codes:
  86787
**Vasoactive Intestinal Peptides**

**VIP**

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Extraction, RIA

**Reported:**
Test run Tuesday, Wednesday, Friday, Saturday. Turnaround time: 5-6 days.

**Synonyms:**
- VIP

**COLLECTION**

**Sample Type:**
EDTA plasma

**Collect:**
- Lavender top (on ice)

**Amount to Collect:**
6 mL blood

**Preferred Volume:**
3 ml plasma

**Minimum Volume:**
1.1 mL plasma

**Remarks:**
Pre-chill collection tube and transport immediately to lab on wet ice after collection.

Brown&Toland patients must have samples collected in special kit. Contact laboratory at 415-353-1667.

**Stability (from collection to initiation):**
Room temperature 3 days, refrigerated 1 week, frozen at -20C 4 weeks.

**Unacceptable Conditions:**
Sample not received on ice.

**PROCESSING**

**Test Code:**
VIP

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
- Non-B&T patient: Immediately aliquot two portions of >= 1.5 mL EACH, and freeze promptly at -20C in plastic tube. Order Quest #31252P

- B&T patient: Transfer EDTA whole blood to red-stopper tube containing 0.5 mL Trasylol (Aprotinin) solution (10,000 KIU/mL). Mix well, centrifuge, transfer plasma to specially labeled transport tube and freeze at -20C. Send specimen frozen.

**Preferred Volume:**
3 ml plasma

**Minimum Volume:**
1.1 mL plasma
Unacceptable Conditions:
    Sample not received on ice.

Stability (from collection to initiation):
    Room temperature 3 days, refrigerated 1 week, frozen at -20C 4 weeks.

RESULT INTERPRETATION

Units:
    pg/mL

Reference Interval:
    22-42 pg/mL

ADMINISTRATIVE

CPT Codes:
    84586-90

LOINC Codes:
    3125-2

COMPLETE VIEW

Available Stat:
    No

Test Code:
    VIP

Performing Lab:
    Quest

Sendout:
    Yes

Methodology:
    Extraction, RIA

Remarks:
    Pre-chill collection tube and transport immediately to lab on wet ice after collection.

    Brown&Toland patients must have samples collected in special kit. Contact laboratory at 415-353-1667.

Collect:
    Lavender top (on ice)

Amount to Collect:
    6 mL blood

Sample Type:
    EDTA plasma

Preferred Volume:
    3 mL plasma

Minimum Volume:
    1.1 mL plasma

Unacceptable Conditions:
    Sample not received on ice.

Specimen Preparation:
    Non-B&T patient: Immediately aliquot two portions of >= 1.5 mL EACH, and freeze promptly at -20C in plastic tube. Order Quest # 31252P

    B&T patient: Transfer EDTA whole blood to red-stopper tube containing 0.5 mL Trasylol (Aprotinin) solution (10,000 KIU/mL). Mix well, centrifuge, transfer plasma to specially labeled transport tube and freeze at -20C. Send specimen frozen.

Units:
    pg/mL
Reference Interval:
   22-42 pg/mL

Synonyms:
   ● VIP

Stability (from collection to initiation):
   Room temperature 3 days, refrigerated 1 week, frozen at -20C 4 weeks.

Reported:
   Test run Tuesday, Wednesday, Friday, Saturday. Turnaround time: 5-6 days.

CPT Codes:
   84586-90

LOINC Codes:
   3125-2
VDRL, CSF

ORDERING

Available Stat:
No

Performing Lab:
Immunology

Performed:
Wednesday (day shift)

Reported:
1-8 days

Additional Information:
For serum testing see RPR.

Reflex Testing:
Titers are automatically performed on all positive samples and separately billed for.

Synonyms:
- Venereal Disease Research Lab
- Syphilis
- T. pallidum
- Treponema pallidum

COLLECTION

Sample Type:
CSF

Collect:
CSF tube or sterile collection tube

Amount to Collect:
See preferred volume

Preferred Volume:
0.5 mL CSF

Remarks:
Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Stability (from collection to initiation):
Refrigerated 4 days

PROCESSING

Test Code:
VDRL

Test Group:
Syphilis

Performing Lab:
Immunology

Specimen Preparation:
Refrigerate CSF

Preferred Volume:
0.5 mL CSF

Stability (from collection to initiation):
Refrigerated 4 days
RESULT INTERPRETATION

Reference Interval:
  Non-reactive

Additional Information:
  For serum testing see RPR.

ADMINISTRATIVE

CPT Codes:
  86592

LOINC Codes:
  5290-2

COMPLETE VIEW

Available Stat:
  No

Test Code:
  VDRL

Test Group:
  Syphilis

Performing Lab:
  Immunology

Performed:
  Wednesday (day shift)

Remarks:
  Specimen label must contain the date the sample was collected and the legible name of the person who collected the sample.

Collect:
  CSF tube or sterile collection tube

Amount to Collect:
  See preferred volume

Sample Type:
  CSF

Preferred Volume:
  0.5 mL CSF

Specimen Preparation:
  Refrigerate CSF

Reference Interval:
  Non-reactive

Synonyms:
  • Venereal Disease Research Lab
  • Syphilis
  • T. pallidum
  • Treponema pallidum

Stability (from collection to initiation):
  Refrigerated 4 days

Reported:
  1-8 days

Reflex Testing:
  Titers are automatically performed on all positive samples and separately billed for.

Additional Information:
  For serum testing see RPR.
CPT Codes:
86592
LOINC Codes:
5290-2
ORDERING

Ordering Recommendations:
This test should ONLY be ordered for monitoring patients with Rheumatoid arthritis (RA). It is not intended for diagnosis of RA nor should it be used to monitor patients with other non-RA autoimmune disorders.

Note that this test should NOT be ordered in conjunction with C-reactive Protein (CRP) as that inflammatory marker is part of the Vectra panel.

Approval Required:
Yes, for any inpatient orders

Available Stat:
No

Performing Lab:
Crescendo Bioscience

Additional Information:
Note that this test should NOT be ordered in conjunction with C-reactive Protein (CRP) as that inflammatory marker is part of the Vectra panel.

Vectra DA provides an objective and reproducible measure of RA disease activity in both seropositive and seronegative RA patients.

The concentrations of 12 serum proteins are measured. An algorithm is then applied to calculate a single Vectra DA score ranging from 1 to 100 that categorizes RA into low, moderate, or high disease activity.

Vectra DA can provide a baseline assessment of RA disease activity and track it over time. Vectra DA is validated for use in adults diagnosed with RA.

Note: Acute non-RA associated inflammation, recent vaccination, trauma, surgery, infection (e.g. any inflammatory or immunologic stimulus) may all result in an elevated Vectra score that may not reflect the patients RA status. Therefore testing should be avoided when any of these conditions exist and for 10-14 days after they have subsided.

Synonyms:
- Rheumatoid arthritis
- VectraDA
- Vectra DA
- MBDA
- Multi-Biomarker Disease Activity test
- RA Biomarker test
- Crescendo Biomarker Test

COLLECTION

Sample Type:
Serum

Collect:
Gold top

Amount to Collect:
4 mL blood

Preferred Volume:
4 mL serum

Minimum Volume:
4 mL serum

Remarks:
Collect Monday-Friday before noon for same day shipping. Samples cannot be collected after noon on Fridays.
Please print and complete the Vectra Form and send with the sample to the laboratory: [Click here for form]

**Stability (from collection to initiation):**

4 days

---

**PROCESSING**

**Test Code:**

VECTRA

**Sendout:**

Yes

**Performing Lab:**

Crescendo Bioscience

**Specimen Preparation:**

Allow to clot at room temperature (20-25°C) for 30-120 minutes. Centrifuge for 15 minutes (1100-1300 RCF at room temp). **Do not aliquot.** Transport tube and kit to CB. If sample cannot be shipped same day, store refrigerated until next day.

**Preferred Volume:**

- 4 mL serum

**Minimum Volume:**

- 4 mL serum

**Stability (from collection to initiation):**

4 days

---

**RESULT INTERPRETATION**

**Reference Interval:**

See report

**Additional Information:**

Note that this test should NOT be ordered in conjunction with C-reactive Protein (CRP) as that inflammatory marker is part of the Vectra panel.

Vectra DA provides an objective and reproducible measure of RA disease activity in both seropositive and seronegative RA patients.

The concentrations of 12 serum proteins are measured. An algorithm is then applied to calculate a single Vectra DA score ranging from 1 to 100 that categorizes RA into low, moderate, or high disease activity.

Vectra DA can provide a baseline assessment of RA disease activity and track it over time. Vectra DA is validated for use in adults diagnosed with RA.

Note: Acute non-RA associated inflammation, recent vaccination, trauma, surgery, infection (e.g. any inflammatory or immunologic stimulus) may all result in an elevated Vectra score that may not reflect the patients RA status. Therefore testing should be avoided when any of these conditions exist and for 10-14 days after they have subsided.

---

**COMPLETE VIEW**

**Approval Required:**

Yes, for any inpatient orders

**Available Stat:**

No

**Ordering Recommendations:**

This test should **ONLY** be ordered for monitoring patients with Rheumatoid arthritis (RA). It is not intended for diagnosis of RA nor should it be used to monitor patients with other non-RA autoimmune disorders.

Note that this test should NOT be ordered in conjunction with C-reactive Protein (CRP) as that inflammatory marker is part of the Vectra panel.

**Test Code:**

VECTRA
Performing Lab:
Crescendo Bioscience

Sendout:
Yes

Remarks:
Collect Monday-Friday before noon for same day shipping. Samples cannot be collected after noon on Fridays.

Please print and complete the Vectra Form and send with the sample to the laboratory: Click here for form

Collect:
Gold top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
4 mL serum

Minimum Volume:
4 mL serum

Specimen Preparation:
Allow to clot at room temperature (20-25°C) for 30-120 minutes. Centrifuge for 15 minutes (1100-1300 RCF at room temp). Do not aliquot. Transport tube and kit to CB. If sample cannot be shipped same day, store refrigerated until next day.

Reference Interval:
See report

Synonyms:
- Rheumatoid arthritis
- VectraDA
- Vectra DA
- MBDA
- Multi-Biomarker Disease Activity test
- RA Biomarker test
- Crescendo Biomarker Test

Stability (from collection to initiation):
4 days

Additional Information:
Note that this test should NOT be ordered in conjunction with C-reactive Protein (CRP) as that inflammatory marker is part of the Vectra panel.

Vectra DA provides an objective and reproducible measure of RA disease activity in both seropositive and seronegative RA patients.

The concentrations of 12 serum proteins are measured. An algorithm is then applied to calculate a single Vectra DA score ranging from 1 to 100 that categorizes RA into low, moderate, or high disease activity.

Vectra DA can provide a baseline assessment of RA disease activity and track it over time. Vectra DA is validated for use in adults diagnosed with RA.

Note: Acute non-RA associated inflammation, recent vaccination, trauma, surgery, infection (e.g. any inflammatory or immunologic stimulus) may all result in an elevated Vectra score that may not reflect the patients RA status. Therefore testing should be avoided when any of these conditions exist and for 10-14 days after they have subsided.
Vibrio Culture
P159

ORDERING

Approval Required:
Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x31268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, all shifts

Methodology:
Culture

Reported:
2-3 days

Synonyms:
- Stool culture
- Bacterial culture

COLLECTION

Sample Type:
Stool

Collect:
Urine cup or C & S (Cary & Blair) transport medium

Amount to Collect:
5 mL

Preferred Volume:
5 mL

Minimum Volume:
- Fresh stool: 0.5 mL or size of pea
- Stool in C & S (Cary & Blair) transport medium: 5 mL

Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week

Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.

PROCESSING

Test Code:
P159

Performing Lab:
Microbiology

Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

**Preferred Volume:**

5 mL

**Minimum Volume:**

- Fresh stool: 0.5 mL or size of pea
- Stool in C & S (Cary & Blair) transport medium: 5 mL

**Unacceptable Conditions:**

- Unpreserved stool received > 3 hours after collection. More than two samples per day.

**Stability (from collection to initiation):**

- Unpreserved 3 hours, preserved 1 week

---

**RESULT INTERPRETATION**

**Reference Interval:**

No Vibrio cholerae isolated

**Critical Values:**

Inpatient results only. After hours outpatient results will be phoned the following morning. Positive for Vibrio cholerae

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**ADMINISTRATIVE**

**CPT Codes:**

- 87046

**LOINC Codes:**

- 28549-4

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**COMPLETE VIEW**

**Approval Required:**

Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x31268

**Available Stat:**

No

**Test Code:**

P159

**Performing Lab:**

Microbiology

**Performed:**

Set up daily, all shifts

**Methodology:**

Culture

**Remarks:**

Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories' draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

**Collect:**

Urine cup or C & S (Cary & Blair) transport medium

**Amount to Collect:**

5 mL

**Sample Type:**

Stool

**Preferred Volume:**

5 mL

**Minimum Volume:**
Fresh stool: 0.5 mL or size of pea. Stool in C & S (Cary & Blair) transport medium: 5 mL

**Unacceptable Conditions:**
Unpreserved stool received > 3 hours after collection. More than two samples per day.

**Specimen Preparation:**
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

**Reference Interval:**
No Vibrio cholerae isolated

**Critical Values:**
Inpatient results only. After hours outpatient results will be phoned the following morning. Positive for Vibrio cholerae

**Synonyms:**
- Stool culture
- Bacterial culture

**Stability (from collection to initiation):**
Unpreserved 3 hours, preserved 1 week

**Reported:**
2-3 days

**CPT Codes:**
- 87046

**LOINC Codes:**
- 28549-4
Vitamin A
VITÁ

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Reported:
Test run Monday-Friday. Turnaround time: 2-4 days.
Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by 0.0349.
Synonyms:
• Retinol

COLLECTION

Patient Preparation:
An 8 hour fast before specimen collection is preferred.
Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL serum
Minimum Volume:
0.7 mL serum
Remarks:
Wrap the tube in aluminum foil to protect it from light.
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen at -20C, 1 year.
Unacceptable Conditions:
Not protected from light
Rejection Criteria:
Received room temperature, received refrigerated but not protected from light.

PROCESSING

Test Code:
VITA
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Freeze serum at -20C in dark pour-off vial. Order Quest test # 921.
Preferred Volume:
2 mL serum
Minimum Volume:
0.7 mL serum

Unacceptable Conditions:
Not protected from light

Rejection Criteria:
Received room temperature, received refrigerated but not protected from light.

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 1 week, frozen at -20C, 1 year.

RESULT INTERPRETATION

Units:
µg/dL (mcg/dL)

Reference Interval:
Age:
1-6 years 20-43 µg/dL
7-12 years 26-49 µg/dL
13-19 years 26-72 µg/dL
>19 years 38-98 µg/dL

Additional Information:
To convert µg/dL to µmol/L (SI units) multiply by 0.0349.

ADMINISTRATIVE

CPT Codes:
84590-90

LOINC Codes:
2923-1

COMPLETE VIEW

Available Stat:
No

Test Code:
VITA

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
An 8 hour fast before specimen collection is preferred.

Remarks:
Wrap the tube in aluminum foil to protect it from light.

Collect:
Gold top or Red top

Amount to Collect:
4 mL blood

Sample Type:
Serum

Preferred Volume:
2 mL serum

Minimum Volume:
0.7 mL serum
Rejection Criteria:
  Received room temperature, received refrigerated but not protected from light.

Unacceptable Conditions:
  Not protected from light

Specimen Preparation:
  Freeze serum at -20°C in dark pour-off vial. Order Quest test # 921.

Units:
  µg/dL (mcg/dL)

Reference Interval:
  Age:
    1-6 years  20-43 µg/dL
    7-12 years  26-49 µg/dL
    13-19 years 26-72 µg/dL
    >19 years  38-98 µg/dL

Synonyms:
  • Retinol

Stability (from collection to initiation):
  Room temperature 1 day, refrigerated 1 week, frozen at -20°C, 1 year.

Reported:
  Test run Monday-Friday. Turnaround time: 2-4 days.

Additional Information:
  To convert µg/dL to µmol/L (SI units) multiply by 0.0349.

CPT Codes:
  84590-90

LOINC Codes:
  2923-1
Vitamin B1, blood
VIB1

ORDERING

Available Stat:
No
Performing Lab:
Quest
Reported:
5-8 days
Additional Information:
This is the bioactive form of Vitamin B1, and is a suitable replacement for the transketolase assay.

Vitamin B1 is required for branched-chain amino acid and carbohydrate metabolism. Vitamin B1 deficiency is most often due to alcoholism or chronic illness. In the early stage, patients with Vitamin B1 deficiency exhibit anorexia, irritability, apathy, and generalized weakness. Prolonged deficiency causes beriberi.

Synonyms:
- Thiamine Pyrophosphate
- Transketolase
- Beriberi

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood
Remarks:
Wrap tube in foil to protect from light.

Stability (from collection to initiation):
Sample stable at RT for 3 days, refrigerated for 5 days, and frozen at -20C for 5 weeks. However, ideally sample should be processed and frozen as quickly as possible.

Storage/Transport Temperature:
Frozen
Rejection Criteria:
Sample received by Quest at room temperature or refrigerated AND unprotected from light; samples should be transported frozen.

PROCESSING

Test Code:
VIB1
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do not centrifuge. Transfer whole blood to light-safe plastic tube for shipping and freeze at -20C. Order Quest test #29983P.
Preferred Volume: 3 mL blood

Minimum Volume: 1 mL blood

Rejection Criteria:
- Sample received by Quest at room temperature or refrigerated AND unprotected from light; samples should be transported frozen.

Stability (from collection to initiation):
- Sample stable at RT for 3 days, refrigerated for 5 days, and frozen at -20C for 5 weeks. However, ideally sample should be processed and frozen as quickly as possible.

Storage/Transport Temperature:
- Frozen

RESULT INTERPRETATION

Units: nmol/L
Reference Interval: 78-185 nmol/L
Additional Information:
- This is the bioactive form of Vitamin B1, and is a suitable replacement for the transketolase assay.
- Vitamin B1 is required for branched-chain amino acid and carbohydrate metabolism. Vitamin B1 deficiency is most often due to alcoholism or chronic illness. In the early stage, patients with Vitamin B1 deficiency exhibit anorexia, irritability, apathy, and generalized weakness. Prolonged deficiency causes beriberi.

ADMINISTRATIVE

CPT Codes: 84225-90
LOINC Codes: 3000-7

COMPLETE VIEW

Available Stat:
- No
Test Code:
- VIB1
Performing Lab:
- Quest
Sendout:
- Yes
Remarks:
- Wrap tube in foil to protect from light.
Collect:
- Lavender top
Amount to Collect:
- 3 mL blood
Sample Type:
- EDTA whole blood
Preferred Volume:
- 3 mL blood
Minimum Volume:
- 1 mL blood
Rejection Criteria:
Sample received by Quest at room temperature or refrigerated AND unprotected from light; samples should be transported frozen.

**Specimen Preparation:**
Do not centrifuge. Transfer whole blood to light-safe plastic tube for shipping and freeze at -20C. Order Quest test #29983P.

**Units:**

- nmol/L

**Reference Interval:**

- 78-185 nmol/L

**Synonyms:**

- Thiamine Pyrophosphate
- Transketolase
- Beriberi

**Storage/Transport Temperature:**

- Frozen

**Stability (from collection to initiation):**

Sample stable at RT for 3 days, refrigerated for 5 days, and frozen at -20C for 5 weeks. However, ideally sample should be processed and frozen as quickly as possible.

**Reported:**

- 5-8 days

**Additional Information:**

This is the bioactive form of Vitamin B1, and is a suitable replacement for the transketolase assay.

Vitamin B1 is required for branched-chain amino acid and carbohydrate metabolism. Vitamin B1 deficiency is most often due to alcoholism or chronic illness. In the early stage, patients with Vitamin B1 deficiency exhibit anorexia, irritability, apathy, and generalized weakness. Prolonged deficiency causes beriberi.

**CPT Codes:**

- 84225-90

**LOINC Codes:**

- 3000-7
Vitamin B12

ORDERING

Available Stat:  
No

Performing Lab:  
China Basin Chemistry

Performed:  
Wednesday, Sunday (day shift)

Methodology:  
Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Reported:  
1-5 days

Additional Information:  
NOTE: Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/13/2017. The Abbott Architect method reads approximately 14% higher than the Centaur method. Please note that the reference ranges have changed.

Abbott manufacturers B12 internal standards gravimetrically using Cyoanocobalamin (USP Reference Standard). The B12 calibrators are manufactured and tested against these internal standards.

To convert ng/L to pmol/L (SI units) multiply by 0.738.

Cobalamin in the plasma and cytosol is bound to several proteins, including intrinsic factor, transcobalamin I and II and haptocorrin. Biologically active cobalamin is carried by intrinsic factor in the gut and by transcobalamin II in plasma. Changes in the other binding proteins ("R proteins"), can alter total cobalamin without affecting normal biological activity. Similarly, some patients may be deficient in biologically active forms of cobalamin despite "normal" or borderline low total cobalamin. If the measured cobalamin level is inconsistent with the clinical presentation, additional testing for increased serum levels of methylmalonic acid may be helpful in confirming or rejecting a diagnosis of B12-deficiency in individuals with normal or borderline low levels of cobalamin.

Synonyms:  
• Cobalamin

COLLECTION

Sample Type:  
Serum

Collect:  
Gold or Red top

Amount to Collect:  
1 mL blood

Preferred Volume:  
0.3 mL serum

Minimum Volume:  
0.15 mL serum

Stability (from collection to initiation):  
Room Temperature:  3 days
Refrigerated (2-8°C):  7 days

Avoid more than 3 freeze-thaw cycles.

PROCESSING

Test Code:  
VB12

Performing Lab:  
China Basin Chemistry
China Basin Chemistry

Specimen Preparation:
Aliquot and freeze serum at -20°C.

Preferred Volume:
0.3 mL serum

Minimum Volume:
0.15 mL serum

Stability (from collection to initiation):
Room Temperature: 3 days
Refrigerated (2-8°C): 7 days

Avoid more than 3 freeze-thaw cycles.

RESULT INTERPRETATION

Units:
ng/L

Reference Interval:
Adult Reference Range (>=18 years):

<table>
<thead>
<tr>
<th>Age</th>
<th>ng/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 days - &lt; 1 year</td>
<td>259 - 1576</td>
</tr>
<tr>
<td>1 year - &lt; 9 years</td>
<td>283 - 1613</td>
</tr>
<tr>
<td>9 years - &lt; 14 years</td>
<td>252 - 1125</td>
</tr>
<tr>
<td>14 years - &lt; 17 years</td>
<td>244 - 888</td>
</tr>
<tr>
<td>17 years</td>
<td>203 - 812</td>
</tr>
</tbody>
</table>

NOTE: Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/13/2017. The Abbott Architect method reads approximately 14% higher than the Centaur method. Please note that the reference ranges have changed.

Abbott manufacturers B12 internal standards gravimetrically using Cyanoacobalamin (USP Reference Standard). The B12 calibrators are manufactured and tested against these internal standards.

To convert ng/L to pmol/L (SI units) multiply by 0.738.

Cobalamin in the plasma and cytosol is bound to several proteins, including intrinsic factor, transcobalamins I and II and haptocorrin. Biologically active cobalamin is carried by intrinsic factor in the gut and by transcobalamin II in plasma. Changes in the other binding proteins ("R proteins"), can alter total cobalamin without affecting normal biological activity. Similarly, some patients may be deficient in biologically active forms of cobalamin despite "normal" or borderline low total cobalamin. If the measured cobalamin level is inconsistent with the clinical presentation, additional testing for increased serum levels of methylmalonic acid may be helpful in confirming or rejecting a diagnosis of B12-deficiency in individuals with normal or borderline low levels of cobalamin.

ADMINISTRATIVE

CPT Codes:
82607

LOINC Codes:
2132-9
Available Stat: No

Test Code: VB12

Performing Lab: China Basin Chemistry

Performed: Wednesday, Sunday (day shift)

Methodology: Chemiluminescent Microparticle Immunoassay (Abbott Architect i2000)

Collect: Gold or Red top

Amount to Collect: 1 mL blood

Sample Type: Serum

Preferred Volume: 0.3 mL serum

Minimum Volume: 0.15 mL serum

Specimen Preparation: Aliquot and freeze serum at -20°C.

Units: ng/L

Reference Interval: Adult Reference Range (>=18 years):

<table>
<thead>
<tr>
<th>Age</th>
<th>ng/L</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 days - &lt; 1 year</td>
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<tr>
<td>9 years - &lt; 14 years</td>
<td>252-1125</td>
</tr>
<tr>
<td>14 years - &lt; 17 years</td>
<td>244-888</td>
</tr>
<tr>
<td>17 years</td>
<td>203-812</td>
</tr>
</tbody>
</table>

Synonyms: Cobalamin

Stability (from collection to initiation): Room Temperature: 3 days Refrigerated (2-8°C): 7 days Avoid more than 3 freeze-thaw cycles.

Reported: 1-5 days

Additional Information:

NOTE: Method changed from Siemens Centaur XP platform to Abbott Architect i2000 platform on 11/13/2017. The Abbott Architect method reads approximately 14% higher than the Centaur method. Please note that the reference ranges have changed.
Abbott manufacturers B12 internal standards gravimetrically using Cyoanocobalamin (USP Reference Standard). The B12 calibrators are manufactured and tested against these internal standards.

To convert ng/L to pmol/L (SI units) multiply by 0.738.

Cobalamin in the plasma and cytosol is bound to several proteins, including intrinsic factor, transcobalamins I and II and haptocorrin. Biologically active cobalamin is carried by intrinsic factor in the gut and by transcobalamin II in plasma. Changes in the other binding proteins ("R proteins"), can alter total cobalamin without affecting normal biological activity. Similarly, some patients may be deficient in biologically active forms of cobalamin despite "normal" or borderline low total cobalamin. If the measured cobalamin level is inconsistent with the clinical presentation, additional testing for increased serum levels of methylmalonic acid may be helpful in confirming or rejecting a diagnosis of B12-deficiency in individuals with normal or borderline low levels of cobalamin.

CPT Codes:
- 82607

LOINC Codes:
- 2132-9
Vitamin B2
VIB2

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC with fluorometric detection
Reported:
4-7 days
Additional Information:
Vitamin B2 is involved in metabolism of fats, carbohydrates, and protein. The clinical manifestations of deficiency are non-specific. Clinical manifestations include mucocutaneous lesions of the mouth and skin, corneal vascularization, anemia, and personality changes.
Synonyms:
- Riboflavin

COLLECTION

Sample Type:
EDTA plasma
Collect:
Lavender top
Amount to Collect:
4 mL blood
Preferred Volume:
2 mL plasma
Minimum Volume:
0.5 mL plasma
Remarks:
Wrap tube in aluminum foil to protect from light
Stability (from collection to initiation):
Frozen 1 month

PROCESSING

Test Code:
VIB2
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 36399
Preferred Volume:
2 mL plasma
Minimum Volume:
0.5 mL plasma
Stability (from collection to initiation):
Frozen 1 month
RESULT INTERPRETATION

Units:
- nmol/L

Reference Interval:
- 6.2-39.0 nmol/L

Additional Information:
Vitamin B2 is involved in metabolism of fats, carbohydrates, and protein. The clinical manifestations of deficiency are non-specific. Clinical manifestations include mucocutaneous lesions of the mouth and skin, corneal vascularization, anemia, and personality changes.

ADMINISTRATIVE

CPT Codes:
- 84252-90

COMPLETE VIEW

Available Stat:
- No

Test Code:
- VIB2

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- HPLC with fluorometric detection

Remarks:
- Wrap tube in aluminum foil to protect from light

Collect:
- Lavender top

Amount to Collect:
- 4 mL blood

Sample Type:
- EDTA plasma

Preferred Volume:
- 2 mL plasma

Minimum Volume:
- 0.5 mL plasma

Specimen Preparation:
- Aliquot and freeze. Transport to CB frozen. Order Quest test code 36399

Units:
- nmol/L

Reference Interval:
- 6.2-39.0 nmol/L

Synonyms:
- Riboflavin

Stability (from collection to initiation):
- Frozen 1 month

Reported:
- 4-7 days

Additional Information:
Vitamin B2 is involved in metabolism of fats, carbohydrates, and protein. The clinical manifestations of deficiency are non-specific. Clinical manifestations include mucocutaneous lesions of the mouth and skin, corneal vascularization, anemia, and personality changes.

CPT Codes:
Vitamin B3

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: LC/MS/MS
Reported: 2-6 days
Additional Information: Nicotinic Acid occurs naturally in plants and animals and is also added to many foods as a vitamin supplement.
Synonyms: • Niacin

COLLECTION

Sample Type: Serum or EDTA plasma
Collect: Red top or Lavender top
Amount to Collect: 4 mL blood
Preferred Volume: 2 mL serum or plasma
Minimum Volume: 1 mL serum or plasma
Stability (from collection to initiation): Frozen 1 month

PROCESSING

Test Code: VIB3
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Aliquot and freeze. Transport to CB frozen. Order Quest test code 91029.
Preferred Volume: 2 mL serum or plasma
Minimum Volume: 1 mL serum or plasma
Stability (from collection to initiation): Frozen 1 month

RESULT INTERPRETATION

Units:
ng/mL

**Reference Interval:**

Due to the large variability in the metabolism of nicotinic acid, the dosing preparation used (immediate-release vs. extended release), and the mg doses used, the serum concentrations may range from <20 ng/mL to about 30,000 ng/mL. After oral administration of an immediate-release tablet, peak plasma concentrations occur in 4 to 5 hours. The plasma half-life of nicotinic acid is about one hour. In one study, fasting plasma concentrations were reported to be <20 ng/mL. In another study, it was reported that the administration of a single 1000 mg extended-release tablet resulted in mean nicotinic acid concentrations of <50 ng/mL.

Nicotinamide is a metabolite of nicotinic acid. Due to the large variability in the metabolism of nicotinic acid, plasma concentrations of this metabolite are variable. In one study, fasting plasma concentrations were reported to be approximately 40 ng/mL. In another study it was reported that the administration of single 1000 mg of extended-release tablet of nicotinic acid resulted in a mean peak nicotinamide concentration of 400 ng/mL between 5 and 10 hours post dose, decreasing to about 100 ng/mL by 16 hours post dose.

**Additional Information:**

Nicotinic Acid occurs naturally in plants and animals and is also added to many foods as a vitamin supplement.

**ADMINISTRATIVE**

**CPT Codes:**
- 84591-90

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- VIB3

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- LC/MS/MS

**Collect:**
- Red top or Lavender top

**Amount to Collect:**
- 4 mL blood

**Sample Type:**
- Serum or EDTA plasma

**Preferred Volume:**
- 2 mL serum or plasma

**Minimum Volume:**
- 1 mL serum or plasma

**Specimen Preparation:**
- Aliquot and freeze. Transport to CB frozen. Order Quest test code 91029.

**Units:**
- ng/mL

**Reference Interval:**

Due to the large variability in the metabolism of nicotinic acid, the dosing preparation used (immediate-release vs. extended release), and the mg doses used, the serum concentrations may range from <20 ng/mL to about 30,000 ng/mL. After oral administration of an immediate-release tablet, peak plasma concentrations occur in 4 to 5 hours. The plasma half-life of nicotinic acid is about one hour. In one study, fasting plasma concentrations were reported to be <20 ng/mL. In another study, it was reported that the administration of a single 1000 mg extended-release tablet resulted in mean nicotinic acid concentrations of <50 ng/mL.

Nicotinamide is a metabolite of nicotinic acid. Due to the large variability in the metabolism of nicotinic acid, plasma concentrations of this metabolite are variable. In one study, fasting plasma concentrations were reported to be approximately 40 ng/mL. In another study it was reported that the administration of single 1000 mg of extended-release tablet of nicotinic acid resulted in a mean peak nicotinamide concentration of 400 ng/mL between 5 and 10 hours post dose, decreasing to about 100 ng/mL by 16 hours post dose.
Synonyms:
  • Niacin

Stability (from collection to initiation):
  Frozen 1 month

Reported:
  2-6 days

Additional Information:
  Nicotinic Acid occurs naturally in plants and animals and is also added to many foods as a vitamin supplement.

CPT Codes:
  84591-90
**Vitamin B6**

**VIB6**

### ORDERING

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
Liquid Chromatography, Tandem Mass Spectrometry

**Reported:**
Set up 5 days per week. Turnaround time 4-5 days

**Additional Information:**
To convert ng/mL to nmol/L (SI units) multiply by 4.046. Pyridoxine is the molecule most commonly referred to as 'Vit. B6'; Pyridoxal-5'-phosphate is the active form of the vitamin.

**Synonyms:**
- Pyridoxine

### COLLECTION

**Patient Preparation:**
Patient follows an overnight fast, and restricted from alcohol and vitamins for at least 24 hrs.

**Sample Type:**
EDTA plasma

**Collect:**
Lavender top (on ice) (*Green top on ice acceptable)

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Remarks:**
Wrap the collection tube in aluminum foil to protect it from light during transport to the laboratory. If separation of cells can't be performed immediately after collection, keep the whole blood refrigerated (on ice) and protect from light. The separation of cells must be completed within 6 hours.

**Stability (from collection to initiation):**
Room temperature 6 hours, refrigerated 12 hours, frozen at -20C 6 days, frozen at -70C 6 weeks

**Unacceptable Conditions:**
Specimens left at room temperature over 6 hrs. Collected in tubes other than lavender top tubes.

**Rejection Criteria:**
Hemolysis, Lipemia, thawed plasma, specimens not protected from light. Shipped/store at refrigerated or room temperatures. Specimens left at room temperature over 6 hours. Collected in tubes other than lavender top tubes.

### PROCESSING

**Test Code:**
VIB6

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Centrifuge under refrigeration at 2-8 C for 5-10 minutes, transfer plasma into a dark brown transport tube or wrapped in aluminum foil. Freeze the plasma at -20C and ship frozen to China Basin sendouts. Order Quest test # 926.

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.5 mL plasma

**Unacceptable Conditions:**
Specimens left at room temperature over 6 hrs. Collected in tubes other than lavender top tubes.

**Rejection Criteria:**
Hemolysis, Lipemia, thawed plasma, specimens not protected from light. Shipped/store at refrigerated or room temperatures. Specimens left at room temperature over 6 hours. Collected in tubes other than lavender top tubes.

**Stability (from collection to initiation):**
Room temperature 6 hours, refrigerated 12 hours, frozen at -20C 6 days, frozen at -70C 6 weeks

**RESULT INTERPRETATION**

**Units:**
ng/mL

**Reference Interval:**
- 2-17 years: 3.0-35 ng/mL
- > 17 years: 2.1-21.7 ng/mL

**Additional Information:**
To convert ng/mL to nmol/L (SI units) multiply by 4.046. Pyridoxine is the molecule most commonly referred to as ‘Vit. B6’, Pyridoxal-5'-phosphate is the active form of the vitamin.

**ADMINISTRATIVE**

**CPT Codes:**
84207-90

**LOINC Codes:**
30552-4

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
VIB6

**Performing Lab:**
Quest

**Sendout:**
Yes

**Methodology:**
Liquid Chromatography, Tandem Mass Spectrometry

**Patient Preparation:**
Patient follows an overnight fast, and restricted from alcohol and vitamins for at least 24 hrs.

**Remarks:**
Wrap the collection tube in aluminum foil to protect it from light during transport to the laboratory. If separation of cells can't be performed immediately after collection, keep the whole blood refrigerated (on ice) and protect from light. The separation of cells must be completed within 6 hours.

**Collect:**
Lavender top (on ice) (*Green top on ice acceptable)

**Amount to Collect:**
2 mL blood

**Sample Type:**
EDTA plasma

**Preferred Volume:**
- 1 mL plasma

**Minimum Volume:**
- 0.5 mL plasma

**Rejection Criteria:**
- Hemolysis, Lipemia, thawed plasma, specimens not protected from light. Shipped/store at refrigerated or room temperatures.
- Specimens left at room temperature over 6 hours. Collected in tubes other than lavender top tubes.

**Unacceptable Conditions:**
- Specimens left at room temperature over 6 hrs. Collected in tubes other than lavender top tubes.

**Specimen Preparation:**
- Centrifuge under refrigeration at 2-8 C for 5-10 minutes, transfer plasma into a dark brown transport tube or wrapped in aluminum foil.
- Freeze the plasma at -20C and ship frozen to China Basin sendouts. Order Quest test # 926.

**Units:**
- ng/mL

**Reference Interval:**
- 2-17 years: 3.0-35 ng/mL
- > 17 years: 2.1-21.7 ng/mL

**Synonyms:**
- Pyridoxine

**Stability (from collection to initiation):**
- Room temperature 6 hours, refrigerated 12 hours, frozen at -20C 6 days, frozen at -70C 6 weeks

**Reported:**
- Set up 5 days per week. Turnaround time 4-5 days

**Additional Information:**
- To convert ng/mL to nmol/L (SI units) multiply by 4.046. Pyridoxine is the molecule most commonly referred to as 'Vit. B6', Pyridoxal-5'-phosphate is the active form of the vitamin.

**CPT Codes:**
- 84207-90

**LOINC Codes:**
- 30552-4
Vitamin D, 25-Hydroxy

25HD

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Monday - Friday (day shift)
Methodology:
Chemiluminescent Immunoassay - Diasorin Liason XL
Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 2.496.


Synonyms:
- 25-Hydroxycholecalciferol
- 25-OH-D
- Cholecalciferol Metabolite

COLLECTION

Sample Type:
Serum
Collect:
Gold top
Amount to Collect:
3 mL blood
Preferred Volume:
1.0 mL serum
Minimum Volume:
0.4 mL serum
Stability (from collection to initiation):
After separation from cells serum is stable refrigerated for 5 days refrigerated and frozen at -20°C for 6 months

PROCESSING

Test Code:
25HD
Performing Lab:
China Basin Chemistry
Specimen Preparation:
Refrigerate serum aliquot
Preferred Volume:
1.0 mL serum
Minimum Volume:
0.4 mL serum
Stability (from collection to initiation):
After separation from cells serum is stable refrigerated for 5 days refrigerated and frozen at -20°C for 6 months
RESULT INTERPRETATION

Units:
ng/mL
Reference Interval:
20 - 50 ng/mL

25-OHD values < 20 are considered to be insufficient and values < 10 - 12 are associated with vitamin D deficiency and risk for osteomalacia. Although values of 20 or more are generally considered to be sufficient, values in the range of 20 - 30 may be insufficient in certain high risk patient subgroups. There is no known benefit of values > 50, and values > 100 should be avoided because of possible risk of vitamin D toxicity.

Additional Information:
To convert µg/L to nmol/L (SI units) multiply by 2.496.


ADMINISTRATIVE

CPT Codes:
82306
LOINC Codes:
49054-0

COMPLETE VIEW

Available Stat:
No
Test Code:
25HD
Performing Lab:
China Basin Chemistry
Performed:
Monday - Friday (day shift)
Methodology:
Chemiluminescent Immunoassay - Diasorin Liason XL
Collect:
Gold top
Amount to Collect:
3 mL blood
Sample Type:
Serum
Preferred Volume:
1.0 mL serum
Minimum Volume:
0.4 mL serum
Specimen Preparation:
Refrigerate serum aliquot
Units:
ng/mL
Reference Interval:
20 - 50 ng/mL

25-OHD values < 20 are considered to be insufficient and values < 10 - 12 are associated with vitamin D deficiency and risk for osteomalacia. Although values of 20 or more are generally considered to be sufficient, values in the range of 20 - 30 may be insufficient
in certain high risk patient subgroups. There is no known benefit of values > 50, and values > 100 should be avoided because of possible risk of vitamin D toxicity.

**Synonyms:**
- 25-Hydroxycalciferol
- 25-OH-D
- Cholecalciferol Metabolite

**Stability (from collection to initiation):**
After separation from cells serum is stable refrigerated for 5 days refrigerated and frozen at -20C for 6 months

**Additional Information:**
To convert µg/L to nmol/L (SI units) multiply by 2.496.


**CPT Codes:**
- 82306

**LOINC Codes:**
- 49054-0
Vitamin K
VITK

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
HPLC
Additional Information:
Vitamin K is a required co-factor for the synthesis of factors 2, 7, 9, and 10 and proteins C and S. Deficiencies of Vitamin K lead to bleeding. Warfarin acts as an anticoagulant because it is a Vitamin K antagonist.

COLLECTION

Patient Preparation:
Overnight fast preferred.
Sample Type:
Heparinized plasma
Collect:
Dark Green top (Light green acceptable)
Amount to Collect:
8 mL blood
Preferred Volume:
4 mL plasma
Minimum Volume:
2 mL plasma
Remarks:
Wrap sample tube in aluminum foil to protect from light.
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 3 months
Rejection Criteria:
Thawed or refrigerated sample.

PROCESSING

Test Code:
VITK
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Separate and freeze plasma at -20C in dark plastic transport tube or wrapped with aluminum foil. Ship frozen to China Basin. Order Quest # 36585X
Preferred Volume:
4 mL plasma
Minimum Volume:
2 mL plasma
Rejection Criteria:
Thawed or refrigerated sample.
Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20°C 3 months

RESULT INTERPRETATION

Units:
pg/mL

Reference Interval:
80-1160 pg/mL

Additional Information:
Vitamin K is a required co-factor for the synthesis of factors 2, 7, 9, and 10 and proteins C and S. Deficiencies of Vitamin K lead to bleeding. Warfarin acts as an anticoagulant because it is a Vitamin K antagonist.

ADMINISTRATIVE

CPT Codes:
84597-90

LOINC Codes:
3129-4

COMPLETE VIEW

Available Stat:
No

Test Code:
VITK

Performing Lab:
Quest

Sendout:
Yes

Methodology:
HPLC

Patient Preparation:
Overnight fast preferred.

Remarks:
Wrap sample tube in aluminum foil to protect from light.

Collect:
Dark Green top (Light. green acceptable)

Amount to Collect:
8 mL blood

Sample Type:
Heparinized plasma

Preferred Volume:
4 mL plasma

Minimum Volume:
2 mL plasma

Rejection Criteria:
Thawed or refrigerated sample.

Specimen Preparation:
Separate and freeze plasma at -20°C in dark plastic transport tube or wrapped with aluminum foil. Ship frozen to China Basin. Order Quest # 36585X

Units:
pg/mL

Reference Interval:
80-1160 pg/mL

Stability (from collection to initiation):
Room temperature unacceptable, refrigerated unacceptable, frozen at -20C 3 months

Additional Information:
Vitamin K is a required co-factor for the synthesis of factors 2, 7, 9, and 10 and proteins C and S. Deficiencies of Vitamin K lead to bleeding. Warfarin acts as an anticoagulant because it is a Vitamin K antagonist.

CPT Codes:
84597-90

LOINC Codes:
3129-4
von Willebrand Disease, Type 2B (VWF) Sequencing

ORDERING

Ordering Recommendations:
Molecular testing to confirm a phenotypic diagnosis of von Willebrand disease type 2B and to distinguish from pseudo (platelet-type) VWD.

Performing Lab:
ARUP

Methodology:
Polymerase Chain Reaction/Sequencing

Reported:
14-21 days

Synonyms:
- VWD platelet type 2A reflex
- VWF2A Sequencing
- VWD type 2B sequencing assay
- VWF2B Sequencing
- vWF exon 28

COLLECTION

Sample Type:
Blood

Collect:
Lavender (EDTA), pink (K$_2$EDTA) or yellow (ACD Solution A or B).

Amount to Collect:
3 mL

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

PROCESSING

Test Code:
MOLT

ARUP Test Code:
2005486

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)
Additional Processing Instructions:
Order Arup test code 2005486.

Preferred Volume:
3 mL

Minimum Volume:
1 mL

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

RESULT INTERPRETATION

Reference Interval:
By report

Interpretive Data:
Background Information for von Willebrand Disease, Type 2B (VWF) Sequencing:
Characteristics: Mucocutaneous bleeding after brushing or flossing teeth, unexplained bruising, prolonged repeated nosebleeds, menorrhagia, and prolonged bleeding following childbirth, trauma or surgery.
Incidence: Approximately 1 in 100 to 1 in 1000 individuals.
Inheritance: Autosomal dominant for types 2B, 2M and most of 2A; autosomal recessive for 20 percent of 2A.
Penetration: Dominant mutations are incompletely penetrant when VWF:Ag and VWF:RCo levels are 25-50 IU/dL. Full penetration is expected when VWF:Ag and VWF:RCo levels are less than 25 IU/dL.
Cause: Pathogenic VWF mutations in exon 28.
Clinical Sensitivity: 80 percent for vWD types 2A, 2B, and 2M; unknown for other vWD subtypes.
Methodology: Bidirectional sequencing of VWF exon 28 and its intron-exon boundaries.
Analytical Sensitivity and Specificity: 99 percent.
Limitations: Diagnostic errors can occur due to rare sequence variations. Regulatory region mutations, deep intronic mutations, and large deletion/duplications will not be detected. Mutations lying outside of VWF exon 28 are not evaluated.

ADMINISTRATIVE

CPT Codes:
81403

COMPLETE VIEW

Ordering Recommendations:
Molecular testing to confirm a phenotypic diagnosis of von Willebrand disease type 2B and to distinguish from pseudo (platelet-type) VWD.

Test Code:
MOLT

ARUP Test Code:
2005486

Performing Lab:
ARUP

Sendout:
Yes

Performed:
Varies

Methodology:
Polymerase Chain Reaction/Sequencing

Collect:
Lavender (EDTA), pink (K$_2$EDTA) or yellow (ACD Solution A or B).

Amount to Collect:
Sample Type: Blood

Preferred Volume: 3 mL

Minimum Volume: 1 mL

Specimen Preparation:
Transport 3 mL whole blood. (Min: 1 mL)

Additional Processing Instructions:
Order Arup test code 2005486.

Reference Interval:
By report

Interpretive Data:
Background Information for von Willebrand Disease, Type 2B (VWF) Sequencing:
Characteristics: Mucocutaneous bleeding after brushing or flossing teeth, unexplained bruising, prolonged repeated nosebleeds, menorrhagia, and prolonged bleeding following childbirth, trauma or surgery.
Incidence: Approximately 1 in 100 to 1 in 1000 individuals.
Inheritance: Autosomal dominant for types 2B, 2M and most of 2A; autosomal recessive for 20 percent of 2A.
Penetrance: Dominant mutations are incompletely penetrant when VWF:Ag and VWF:RCo levels are 25-50 IU/dL. Full penetrance is expected when VWF:Ag and VWF:RCo levels are less than 25 IU/dL.
Cause: Pathogenic VWF mutations in exon 28.
Clinical Sensitivity: 80 percent for vWD types 2A, 2B, and 2M; unknown for other vWD subtypes.
Methodology: Bidirectional sequencing of VWF exon 28 and its intron-exon boundaries.
Analytical Sensitivity and Specificity: 99 percent.
Limitations: Diagnostic errors can occur due to rare sequence variations. Regulatory region mutations, deep intronic mutations, and large deletion/duplications will not be detected. Mutations lying outside of VWF exon 28 are not evaluated.

Synonyms:
- VWD platelet type 2A reflex
- VWF2A Sequencing
- VWD type 2B sequencing assay
- VWF2B Sequencing
- vWF exon 28

Storage/Transport Temperature:
Refrigerated.

Stability (from collection to initiation):
Ambient: 72 hours; Refrigerated: 1 week; Frozen: Unacceptable

Reported:
14-21 days

CPT Codes:
81403
von Willebrand Factor - Factor 8 Binding Ratio
VW2NR

ORDERING

Ordering Recommendations:
- This assay will only be performed if the factor 8 activity is abnormal.

Available Stat:
- No

Performing Lab:
- Quest

Methodology:
- Immunoassay

Reported:
- Set up at least 1x per month. Turnaround 2-5 weeks

Additional Information:
- This test is used to differentiate between hemophilia A, hemophilia A carrier state, and type 2N vWD.

Type 2N-von Willebrand disease is an inherited bleeding disorder characterized by a qualitative defect in VWF in which it does not bind Factor VIII adequately, and the plasma half life of Factor VIII activity is shortened. Laboratory studies in patients with 2N VWD reveal a discrepancy between Factor VIII activity and von Willebrand factor antigen. Factor VIII activity levels are disproportionately depressed compared to VWF levels.

For selection of proper therapy, it is important to distinguish between 2N VWD and hemophilic disorders.

Synonyms:
- vwd
- vWF-Factor VIII binding ratio
- von Willebrand Disease type 2N
- Factor VIII-von Willebrand Factor Binding Assay

COLLECTION

Patient Preparation:
- Patient should not have received plasma, cryoprecipitate, recombinant vWF or vWF concentrates prior to testing.

Sample Type:
- Citrated plasma

Collect:
- Blue top filled to full extent of vacuum

Amount to Collect:
- 2.7 mL blood

Preferred Volume:
- 1 mL plasma

Minimum Volume:
- 0.5 mL plasma

Remarks:
- 1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
- 2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
- 3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
- 4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Stability (from collection to initiation):
- Frozen at -20°C 21 days

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Rejection Criteria:
   Sample received thawed, or after improper handling / storage

PROCESSING

Test Code:
   VW2NR
Test Group:
   von Willebrand
Sendout:
   Yes
Performing Lab:
   Quest
Specimen Preparation:
   Freeze plasma in 0.5 mL aliquots. Order Quest #70068
Preferred Volume:
   1 mL plasma
Minimum Volume:
   0.5 mL plasma
Unacceptable Conditions:
   Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected
Rejection Criteria:
   Sample received thawed, or after improper handling / storage
Stability (from collection to initiation):
   Frozen at -20C 21 days

RESULT INTERPRETATION

Units:
   Ratio
Reference Interval:
   vWF-Factor VIII binding ratio: 0.73-1.42
Additional Information:
   This test is used to differentiate between hemophilia A, hemophilia A carrier state, and type 2N vWD.
   Type 2N-von Willebrand disease is an inherited bleeding disorder characterized by a qualitative defect in VWF in which it does not bind Factor VIII adequately, and the plasma half life of Factor VIII activity is shortened. Laboratory studies in patients with 2N VWD reveal a discrepancy between Factor VIII activity and von Willebrand factor antigen. Factor VIII activity levels are disproportionately depressed compared to VWF levels.
   For selection of proper therapy, it is important to distinguish between 2N VWD and hemophilic disorders.

ADMINISTRATIVE

CPT Codes:
   83520-90
LOINC Codes:
   48593-8

COMPLETE VIEW

Available Stat:
   No
Ordering Recommendations:
   This assay will only be performed if the factor 8 activity is abnormal.
Test Code: VW2NR
Test Group: von Willebrand
Performing Lab: Quest
Sendout: Yes
Methodology: Immunoassay

Patient Preparation:
Patient should not have received plasma, cryoprecipitate, recombinant vWF or vWF concentrates prior to testing.

Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

Collect:
Blue top filled to full extent of vacuum

Amount to Collect:
2.7 mL blood

Sample Type:
Citrated plasma

Preferred Volume:
1 mL plasma

Minimum Volume:
0.5 mL plasma

Rejection Criteria:
Sample received thawed, or after improper handling / storage

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Freeze plasma in 0.5 mL aliquots. Order Quest #70068

Units:
Ratio

Reference Interval:
vWF-Factor VIII binding ratio: 0.73-1.42

Synonyms:
- vwd
- vWF-Factor VIII binding ratio
- von Willebrand Disease type 2N
- Factor VIII-von Willebrand Factor Binding Assay

Stability (from collection to initiation):
Frozen at -20C 21 days

Reported:
Set up at least 1x per month. Turnaround 2-5 weeks

Additional Information:
This test is used to differentiate between hemophilia A, hemophilia A carrier state, and type 2N vWD.

Type 2N-von Willebrand disease is an inherited bleeding disorder characterized by a qualitative defect in VWF in which it does not bind Factor VIII adequately, and the plasma half life of Factor VIII activity is shortened. Laboratory studies in patients with 2N VWD reveal a discrepancy between Factor VIII activity and von Willebrand factor antigen. Factor VIII activity levels are disproportionately depressed compared to VWF levels.
For selection of proper therapy, it is important to distinguish between 2N VWD and hemophilic disorders.

**CPT Codes:**
- 83520-90

**LOINC Codes:**
- 48593-8
von Willebrand Factor Antigen
VWFAG

ORDERING

Available Stat:
No
Performing Lab:
Parnassus Hematology
Reported:
Test run q1-2 weeks. Turnaround time: 3-10 days

Additional Information:
During infancy, vWF Antigen values can be greater than those observed in adults. Nevertheless, a value of approximately 40% was noted as the lower limit of normal for full term infants from birth to 6 months. (Reference: Andrew M. et al. Blood 1987 70:165).

Asymptomatic abnormalities of von Willebrand factor are common. The reference interval for von Willebrand Factor Antigen is set such that 2.5% of people will be below the limit of the reference range. Approximately 1 in 8000 people have symptomatic von Willebrand disease (VWD), which is usually associated with mucocutaneous bleeding.

Von Willebrand Factor Antigen levels should be correlated with patient and family bleeding history, as clinically indicated. The Ristocetin Cofactor Assay can be useful for assessing von Willebrand Factor Activity.

The presence of rheumatoid factor may lead to an over-estimation of the vWF level. The extremely rare presence of anti-bovine and/or anti-rabbit antibodies in certain patients may lead to an over-estimation of the vWF level

Synonyms:
- VWF:Ag
- Factor VIII-Related Antigen
- FVIII:RAg
- FVIII:VWAg
- VWAG
- VW
- VWF Antigen
- vwd

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**PROCESSING**

**Test Code:**
- VWFAG

**Test Group:**
- von Willebrand

**Performing Lab:**
- Parnassus Hematology

**Specimen Preparation:**
- If this test is ordered with Factor VIII Activity and Ristocetin Cofactor on the same sample, enter VWP to request all three tests.

**Preferred Volume:**
- 1 mL plasma

**Unacceptable Conditions:**
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

**RESULT INTERPRETATION**

**Units:**
- %

**Reference Interval:**
- 42-191%

- See Additional Information

**Additional Information:**
- During infancy, vWF Antigen values can be greater than those observed in adults. Nevertheless, a value of approximately 40% was noted as the lower limit of normal for full term infants from birth to 6 months. (Reference: Andrew M. et al. Blood 1987 70:165).

- Asymptomatic abnormalities of von Willebrand factor are common. The reference interval for von Willebrand Factor Antigen is set such that 2.5% of people will be below the limit of the reference range. Approximately 1 in 8000 people have symptomatic von Willebrand disease (VWD), which is usually associated with mucocutaneous bleeding.

- Von Willebrand Factor Antigen levels should be correlated with patient and family bleeding history, as clinically indicated. The Ristocetin Cofactor Assay can be useful for assessing von Willebrand Factor Activity.

- The presence of rheumatoid factor may lead to an over-estimation of the vWF level. The extremely rare presence of anti-bovine and/or anti-rabbit antibodies in certain patients may lead to an over-estimation of the vWF level

**ADMINISTRATIVE**

**CPT Codes:**
- 85246

**LOINC Codes:**
- 41867-3

**COMPLETE VIEW**

**Available Stat:**
- No

**Test Code:**
- VWFAG

**Test Group:**
- von Willebrand

**Performing Lab:**
- Parnassus Hematology
Remarks:

1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
- Blue top filled to full extent of vacuum

Amount to Collect:
- 2.7 mL blood

Sample Type:
- Citrated plasma

Preferred Volume:
- 1 mL plasma

Unacceptable Conditions:
- Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
- If this test is ordered with Factor VIII Activity and Ristocetin Cofactor on the same sample, enter VWP to request all three tests.

Units:
- %

Reference Interval:
- 42-191%

See Additional Information

Synonyms:
- VWF:Ag
- Factor VIII-Related Antigen
- FVIII:RAg
- FVIII:VWAg
- VWAG
- VW
- VWF Antigen
- vwd

Reported:
- Test run q1-2 weeks. Turnaround time: 3-10 days

Additional Information:

During infancy, vWF Antigen values can be greater than those observed in adults. Nevertheless, a value of approximately 40% was noted as the lower limit of normal for full term infants from birth to 6 months. (Reference: Andrew M. et al. Blood 1987 70:165).

Asymptomatic abnormalities of von Willebrand factor are common. The reference interval for von Willebrand Factor Antigen is set such that 2.5% of people will be below the limit of the reference range. Approximately 1 in 8000 people have symptomatic von Willebrand disease (VWD), which is usually associated with mucocutaneous bleeding.

Von Willebrand Factor Antigen levels should be correlated with patient and family bleeding history, as clinically indicated. The Ristocetin Cofactor Assay can be useful for assessing von Willebrand Factor Activity.

The presence of rheumatoid factor may lead to an over-estimation of the vWF level. The extremely rare presence of anti-bovine and/or anti-rabbit antibodies in certain patients may lead to an over-estimation of the vWF level.

CPT Codes:
- 85246

LOINC Codes:
- 41867-3
von Willebrand Factor Multimers
VWMULT

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
Electrophoresis
Reported:
3-5 days
Additional Information:
von Willebrand Disease is the most common hereditary bleeding disorder; it may also be acquired. von Willebrand Factor is necessary for platelet adhesion to injured endothelium. von Willebrand Factor Antigen, Multimeric Analysis is useful when type 2 disease is suspected and to further categorize disease.

Synonyms:
- Factor VIII Multimers
- Factor VIII-Related Antigen Multimers
- FVIII:RM
- vW Multimers
- von Willebrand multimers
- von willebrand related multimers
- VW factor multimers
- Factor VIII-Related Multimers
- Factor 8 Multimers
- Factor 8-Related Antigen Multimers
- F8 vW Multimers
- Factor 8-Related Multimers

COLLECTION

Sample Type:
Citrated plasma
Collect:
Blue top filled to full extent of vacuum
Amount to Collect:
2.7 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.2 mL plasma
Stability (from collection to initiation):
Frozen 6 months

PROCESSING

Test Code:
VWMULT
Test Group:
von Willebrand

Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Deliver specimen immediately to Hematology M524 for processing.

Preferred Volume:
- 1 mL plasma
Minimum Volume:
- 0.2 mL plasma
Stability (from collection to initiation):
- Frozen 6 months

RESULT INTERPRETATION

Reference Interval:
Normal pattern
Additional Information:
von Willebrand Disease is the most common hereditary bleeding disorder; it may also be acquired. von Willebrand Factor is necessary for platelet adhesion to injured endothelium. von Willebrand Factor Antigen, Multimeric Analysis is useful when type 2 disease is suspected and to further categorize disease.

ADMINISTRATIVE

CPT Codes:
85247-90

COMPLETE VIEW

Available Stat:
No
Test Code:
VWMULT
Test Group:
von Willebrand
Performing Lab:
Quest
Sendout:
Yes
Methodology:
Electrophoresis
Collect:
- Blue top filled to full extent of vacuum
Amount to Collect:
- 2.7 mL blood
Sample Type:
- Citrated plasma
Preferred Volume:
- 1 mL plasma
Minimum Volume:
- 0.2 mL plasma
Specimen Preparation:
- Deliver specimen immediately to Hematology M524 for processing.
Reference Interval:
Normal pattern

**Synonyms:**
- Factor VIII Multimers
- Factor VIII-Related Antigen Multimers
- FVIII:RM
- vW Multimers
- von Willebrand multimers
- von willebrand related multimers
- VW factor multimers
- Factor VIII-Related Multimers
- Factor 8 Multimers
- Factor 8-Related Antigen Multimers
- F8 vW Multimers
- Factor 8-Related Multimers

**Stability (from collection to initiation):**
Frozen 6 months

**Reported:**
- 3-5 days

**Additional Information:**
von Willebrand Disease is the most common hereditary bleeding disorder; it may also be acquired. von Willebrand Factor is necessary for platelet adhesion to injured endothelium. von Willebrand Factor Antigen, Multimeric Analysis is useful when type 2 disease is suspected and to further categorize disease.

**CPT Codes:**
- 85247-90
von Willebrand Panel
VWP

ORDERING

Available Stat: 
No
Performing Lab: 
Parnassus Hematology
Reported: 
Test run q1-2 weeks. Turnaround time: 1-4 weeks.
Additional Information: 
This panel includes Factor VIII Activity, Ristocetin Cofactor, and Von Willebrand Factor Antigen.
For additional information, see entries for individual panel members.
Synonyms: 
• vwd

COLLECTION

Sample Type: 
Citrated plasma
Collect: 
Blue top filled to full extent of vacuum x2
Amount to Collect: 
5.4 mL blood
Preferred Volume: 
2 mL plasma
Remarks: 
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.
For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Unacceptable Conditions: 
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

PROCESSING

Test Code: 
VWP
Test Group: 
von Willebrand
Performing Lab: 
Parnassus Hematology
Specimen Preparation: 
Freeze plasma in plastic at -20C.
Contains test codes: F8,VWFAG, RCOF
Preferred Volume: 
2 mL plasma
Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

RESULT INTERPRETATION

Additional Information:
This panel includes Factor VIII Activity, Ristocetin Cofactor, and Von Willebrand Factor Antigen.
For additional information, see entries for individual panel members.

ADMINISTRATIVE

CPT Codes:
85240, 85245, 85246
LOINC Codes:
48593-8

COMPLETE VIEW

Available Stat:
No
Test Code:
VWP
Test Group:
von Willebrand
Performing Lab:
Parnassus Hematology
Remarks:
1. Check the expiration date on the label of the blue top vacutainer before drawing the patient.
2. For blood collection in a sodium citrate blue top, the tube must be filled to above the Minimum Fill Indicator on the tube. It is crucial to wait and allow the tube to stop filling before removing it from the needle.
3. With use of a butterfly needle, draw about 1 cc using a separate blue top to remove air from tubing, discard the first tube and then draw a second blue top tube filled to the full extent of the vacuum.
4. Tubes should not be filled past the Maximum Fill dashed line by either using a syringe or removing the tube cap.

For patients with Hct's >= 55% please contact Hematology (415-353-1747) to obtain blue top tubes with adjusted citrate volumes in order to maintain the proper citrate to plasma ratio for coagulation studies.

Collect:
Blue top filled to full extent of vacuum x2
Amount to Collect:
5.4 mL blood
Sample Type:
Citrated plasma
Preferred Volume:
2 mL plasma

Unacceptable Conditions:
Samples collected in outdated blue top vacutainer. Over-filled or under-filled tubes may be rejected

Specimen Preparation:
Freeze plasma in plastic at -20C.

Contains test codes: F8,VWFAG, RCOF

Synonyms:
• vwd

Reported:
Test run q1-2 weeks. Turnaround time: 1-4 weeks.

Additional Information:
This panel includes Factor VIII Activity, Ristocetin Cofactor, and Von Willebrand Factor Antigen.

For additional information, see entries for individual panel members.

**CPT Codes:**
- 85240, 85245, 85246

**LOINC Codes:**
- 48593-8
Voriconazole
VORIC

ORDERING

Available Stat:
No
Performing Lab:
China Basin Chemistry
Performed:
Tuesday and Friday AM (excluding holidays)
Methodology:
Liquid chromatography-tandem mass spectrometry (LC-MS/MS)
Reported:
3-4 days
Additional Information:
Voriconazole is a triazole antifungal agent. It has activity against a broad spectrum of clinically significant fungal pathogens in immunocompromised patients, including Candida, Aspergillus, Scedosporium and Fusarium species.

Voriconazole is predominantly metabolized in the liver by the cytochrome P450 enzyme system, mainly by the isozyme CYP2C19. Substantial inter- and intra-patient variation in the voriconazole exposure is observed, likely due to greater metabolism of the drug by certain population groups, reduced metabolism by those with hepatic impairment, and co-administration of other drugs that increase or decrease the systemic concentration of voriconazole.
Indications for voriconazole TDM
Voriconazole trough levels should be obtained in most patients, whether receiving the agent for prophylaxis or treatment of fungal infections. Trough samples should be obtained 3-5 days after:
- start of therapy
- change in dose
- change in route of administration
- change in potentially interacting drugs

Trough levels may also be obtained to investigate lack of response to therapy or for suspected toxicity.

<table>
<thead>
<tr>
<th>Voriconazole start/change date:</th>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order voriconazole trough level before evening dose on:</td>
<td>Thursday</td>
<td>Thursday</td>
<td>Thursday (Monday if start is late Tuesday)</td>
<td>Monday</td>
<td>Monday</td>
<td>Monday</td>
<td>Monday (Thursday if start is late Saturday)</td>
</tr>
</tbody>
</table>

COLLECTION

Sample Type:
Serum
Collect:
Red top tube

Note: UCSF does not offer CSF testing. If required, this can be ordered as a MOLT from Quest.

Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.3 mL serum
Remarks:
Collect trough levels just before next dose. Peak levels:
IV: 15-30 minutes after end of infusion  
IM: 45-60 minutes after injection  
PO: 90 minutes after ingestion  

**Stability (from collection to initiation):**  
Refrigerated 3 months, frozen 2 years

### PROCESSING

**Test Code:**  
VORIC  
**Performing Lab:**  
China Basin Chemistry  
**Specimen Preparation:**  
Centrifuge blood and separate serum from cells as soon as possible. Keep sample refrigerated.  
**Preferred Volume:**  
1 mL serum  
**Minimum Volume:**  
0.3 mL serum  
**Stability (from collection to initiation):**  
Refrigerated 3 months, frozen 2 years

### RESULT INTERPRETATION

**Units:**  
µg/mL (mcg/mL)  
**Reference Interval:**  
Target range:  

- Adults (>= 18 years old)  
  Treatment/prophylaxis: steady-state trough range for most situations should be 2.0-6.0 µg/mL.  

- Pediatrics (< 18 years old)  
  Treatment/prophylaxis: steady-state trough range for most situations should be 1.0-5.5 µg/mL.  

In adults, serum trough levels of >= 1.5-2.0 µg/mL are associated with greater likelihood of response in invasive fungal infections.  
Serum trough levels of > 5.0-6.0 µg/mL have been reported to be associated with reversible neurological adverse events such as hallucinations and possibly hepatotoxicity.  
For levels outside of the therapeutic range, consultation with ID or ID pharmacy is recommended.  
Levels should be re-checked until a result in the therapeutic range is obtained, and after changes in doses/route/interacting drugs. For patients on long-term voriconazole on stable doses, consider checking surveillance levels every 3 months.  

**References:**  
immunocompromised patients, including Candida, Aspergillus, Scedosporium and Fusarium species.

Voriconazole is predominantly metabolized in the liver by the cytochrome P450 enzyme system, mainly by the isozyme CYP2C19. Substantial inter- and intra-patient variation in the voriconazole exposure is observed, likely due to greater metabolism of the drug by certain population groups, reduced metabolism by those with hepatic impairment, and co-administration of other drugs that increase or decrease the systemic concentration of voriconazole.

Indications for voriconazole TDM
Voriconazole trough levels should be obtained in most patients, whether receiving the agent for prophylaxis or treatment of fungal infections. Trough samples should be obtained 3-5 days after:
- start of therapy
- change in dose
- change in route of administration
- change in potentially interacting drugs

Trough levels may also be obtained to investigate lack of response to therapy or for suspected toxicity.

<table>
<thead>
<tr>
<th>Voriconazole start/change date:</th>
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</thead>
<tbody>
<tr>
<td>Sunday</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Order voriconazole trough level before evening dose on:</td>
</tr>
</tbody>
</table>

**ADMINISTRATIVE**

**CPT Codes:**
80299

**LDT or Modified FDA:**
Yes

**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
VORIC

**Performing Lab:**
China Basin Chemistry

**Performed:**
Tuesday and Friday AM (excluding holidays)

**Methodology:**
Liquid chromatography-tandem mass spectrometry (LC-MS/MS)

**Remarks:**
Collect trough levels just before next dose. Peak levels:
- IV: 15-30 minutes after end of infusion
- IM: 45-60 minutes after injection
- PO: 90 minutes after ingestion

**Collect:**
Red top tube

Note: UCSF does not offer CSF testing. If required, this can be ordered as a MOLT from Quest.

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum
Minimum Volume:
0.3 mL serum

Specimen Preparation:
Centrifuge blood and separate serum from cells as soon as possible. Keep sample refrigerated.

Units:
µg/mL (mcg/mL)

Reference Interval:
Target range:

Adults (>= 18 years old)
Treatment/prophylaxis: steady-state trough range for most situations should be 2.0-6.0 µg/mL.

Pediatrics (< 18 years old)
Treatment/prophylaxis: steady-state trough range for most situations should be 1.0-5.5 µg/mL.

In adults, serum trough levels of >= 1.5-2.0 µg/mL are associated with greater likelihood of response in invasive fungal infections.

Serum trough levels of > 5.0-6.0 µg/mL have been reported to be associated with reversible neurological adverse events such as hallucinations and possibly hepatotoxicity.

For levels outside of the therapeutic range, consultation with ID or ID pharmacy is recommended.

Levels should be re-checked until a result in the therapeutic range is obtained, and after changes in doses/route/interacting drugs. For patients on long-term voriconazole on stable doses, consider checking surveillance levels every 3 months.

References:


Stability (from collection to initiation):
Refrigerated 3 months, frozen 2 years

Reported:
3-4 days

Additional Information:
Voriconazole is a triazole antifungal agent. It has activity against a broad spectrum of clinically significant fungal pathogens in immunocompromised patients, including Candida, Aspergillus, Scedosporium and Fusarium species.

Voriconazole is predominantly metabolized in the liver by the cytochrome P450 enzyme system, mainly by the isozyme CYP2C19. Substantial inter- and intra-patient variation in the voriconazole exposure is observed, likely due to greater metabolism of the drug by certain population groups, reduced metabolism by those with hepatic impairment, and co-administration of other drugs that increase or decrease the systemic concentration of voriconazole.

Indications for voriconazole TDM
Voriconazole trough levels should be obtained in most patients, whether receiving the agent for prophylaxis or treatment of fungal infections. Trough samples should be obtained 3-5 days after:
- start of therapy
- change in dose
- change in route of administration
- change in potentially interacting drugs

Trough levels may also be obtained to investigate lack of response to therapy or for suspected toxicity.
| Order voriconazole trough level before evening dose on: | Thursday | Thursday | Thursday (Monday if start is late Tuesday) | Monday | Monday | Monday | Monday (Thursday if start is late Saturday) |

CPT Codes:
- 80299

LDT or Modified FDA:
- Yes
Walnut Component Panel
WCOMP

ORDERING
Performing Lab:
Quest
Performed:
Tuesday-Saturday
Methodology:
Immunoassay
Reported:
1-3 days
Synonyms:
- Walnut Component Panel IgE

COLLECTION
Sample Type:
Serum
Collect:
Gold or Red-top
Amount to Collect:
1.0 mL blood
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room Temperate and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature:
Frozen

PROCESSING
Test Code:
WCOMP
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94472.
Preferred Volume:
0.5 mL serum
Minimum Volume:
0.3 mL serum
Stability (from collection to initiation):
Room Temperate and Refrigerated: 14 days
Frozen: 30 days
Storage/Transport Temperature:
Frozen

Test information subject to change
RESULT INTERPRETATION

Units:
  kU/L
Reference Interval:
  <0.10

ADMINISTRATIVE

CPT Codes:
  86008x2
LOINC Codes:
  81790-8, 81789-0

COMPLETE VIEW

Test Code:
  WCOMP
Performing Lab:
  Quest
Sendout:
  Yes
Performed:
  Tuesday-Saturday
Methodology:
  Immunoassay
Collect:
  Gold or Red-top
Amount to Collect:
  1.0 mL blood
Sample Type:
  Serum
Preferred Volume:
  0.5 mL serum
Minimum Volume:
  0.3 mL serum
Specimen Preparation:
  Aliquot and freeze. Send to China Basin frozen. Order Quest test code 94472.
Units:
  kU/L
Reference Interval:
  <0.10
Synonyms:
  • Walnut Component Panel IgE
Storage/Transport Temperature:
  Frozen
Stability (from collection to initiation):
  Room Temperate and Refrigerated: 14 days
  Frozen: 30 days
Reported:
  1-3 days
CPT Codes:
  86008x2
LOINC Codes:
Warfarin Genotype
WARFN

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: PCR
Reported: 4-6 days
Synonyms:
- Warfarin metabolism
- CYP2C9

COLLECTION

Sample Type: EDTA or heparinized whole blood
Collect: Lavender top, Dark green top
Amount to Collect: 5 mL blood
Preferred Volume: 5 mL blood
Minimum Volume: 3 mL blood

PROCESSING

Test Code: WARFN
Sendout: Yes
Performing Lab: Quest
Specimen Preparation:
- Do not aliquot sample. Transport to CB & Quest at ambient temperature. Order Quest code 16160X
Preferred Volume: 5 mL blood
Minimum Volume: 3 mL blood

ADMINISTRATIVE

CPT Codes:
81355-90, 81227-90

COMPLETE VIEW

Available Stat:
Test Code: WARFN
Performing Lab: Quest
Sendout: Yes
Methodology: PCR
Collect: Lavender top, Dark green top
Amount to Collect: 5 mL blood
Sample Type: EDTA or heparinized whole blood
Preferred Volume: 5 mL blood
Minimum Volume: 3 mL blood
Specimen Preparation: Do not aliquot sample. Transport to CB & Quest at ambient temperature. Order Quest code 16160X
Synonyms:
- Warfarin metabolism
- CYP2C9
Reported: 4-6 days
CPT Codes: 81355-90, 81227-90
WBC Count
CBC, CBCD, WBC, WBCDF

ORDERING

Available Stat:
Yes

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Reported:
STAT 1 hour, Routine 4 hours

Synonyms:
- Leukocyte count
- white cell count
- white blood cell count

COLLECTION

Sample Type:
EDTA whole blood

Collect:
Lavender top

Amount to Collect:
3 mL blood

Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

PROCESSING

Test Code:
CBC, CBCD, WBC, WBCDF

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

RESULT INTERPRETATION

Units:
\( \times 10^9/\text{L} \)

Reference Interval:

<table>
<thead>
<tr>
<th>Age</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24 hours</td>
<td>9.0-38.0 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>24 hours-1 wk</td>
<td>5.0-34.0 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>1 wk-6 months</td>
<td>5.0-21.0 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>6 months-4 years</td>
<td>5.5-17.5 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>4-14 years</td>
<td>4.5-15.5 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>14-21 years</td>
<td>4.5-13.2 ( \times 10^9/\text{L} )</td>
</tr>
<tr>
<td>&gt;21 years</td>
<td>3.4-10.0 ( \times 10^9/\text{L} )</td>
</tr>
</tbody>
</table>

Critical Values:

Printed 06/07/19
Test information subject to change
<1 1.5 x10⁹/L or >= 100.0 x10⁹/L will be telephoned if a new finding within the past 24 hours.

**ADMINISTRATIVE**

CPT Codes:
- 85048

**COMPLETE VIEW**

Available Stat:
- Yes

Test Code:
- CBC, CBCD, WBC, WBCDF

Performing Lab:
- Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
- Test available 24 hours per day 7 days per week

Collect:
- Lavender top

Amount to Collect:
- 3 mL blood

Sample Type:
- EDTA whole blood

Minimum Volume:
- 1 mL blood (or 250 µL in a pedi-bullet)

Units:
- x10⁹/L

Reference Interval:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Reference Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24 hours</td>
<td>9.0-38.0 x10⁹/L</td>
</tr>
<tr>
<td>24 hours-1 wk</td>
<td>5.0-34.0 x10⁹/L</td>
</tr>
<tr>
<td>1 wk-6 months</td>
<td>5.0-21.0 x10⁹/L</td>
</tr>
<tr>
<td>6 months-4 years</td>
<td>5.5-17.5 x10⁹/L</td>
</tr>
<tr>
<td>4-14 years</td>
<td>4.5-15.5 x10⁹/L</td>
</tr>
<tr>
<td>14-21 years</td>
<td>4.5-13.2 x10⁹/L</td>
</tr>
<tr>
<td>&gt;21 years</td>
<td>3.4-10.0 x10⁹/L</td>
</tr>
</tbody>
</table>

Critical Values:
- <1 1.5 x10⁹/L or >= 100.0 x10⁹/L will be telephoned if a new finding within the past 24 hours.

Synonyms:
- Leukocyte count
- white cell count
- white blood cell count

Reported:
- STAT 1 hour, Routine 4 hours

CPT Codes:
- 85048
### West Nile Virus Antibodies, Serum (IgG & IgM)

#### ORDERING

**Available Stat:**
- No

**Performing Lab:**
- Quest

**Methodology:**
- EIA

**Additional Information:**
West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, sera with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

**Reflex Testing:**
- See ‘Additional information’

**Synonyms:**
- WNV

#### COLLECTION

**Sample Type:**
- Serum (see Collection Instructions)

**Collect:**
- Gold top, Red top

**Amount to Collect:**
- 4 mL blood

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 0.7 mL serum

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen @ -20C 1 month, frozen @ -70C indefinite

#### PROCESSING

**Test Code:**
- WNVS

**Test Group:**
- WNV

**Sendout:**
- Yes

**Performing Lab:**
- Quest

**Specimen Preparation:**
- Order Quest test #36596, freeze serum at -20C.

**Note:** Do not use test code WNVN (WNV NAT) or PTXID (Organ Donor Testing) when only West Nile Virus is ordered. Only use test code WNVS.

**Preferred Volume:**
- 2 mL serum

**Minimum Volume:**
- 0.7 mL serum
Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen @ -20C 1 month, frozen @ -70C indefinite

RESULT INTERPRETATION

Units:
Index

Reference Interval:
West Nile Virus IgG:
Negative  <1.30
Equivocal 1.30-1.49
Positive  >=1.50

West Nile Virus IgM:
Negative  <0.90
Equivocal 0.90-1.10
Positive  >1.10

Additional Information:
West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, sera with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

ADMINISTRATIVE

CPT Codes:
86788-90, 86789-90

LOINC Codes:
36897-7

COMPLETE VIEW

Available Stat:
No

Test Code:
WNVS

Test Group:
WNV

Performing Lab:
Quest

Sendout:
Yes

Methodology:
EIA

Collect:
Gold top, Red top

Amount to Collect:
4 mL blood

Sample Type:
Serum (see Collection Instructions)

Preferred Volume:
2 mL serum

Minimum Volume:
0.7 mL serum

Specimen Preparation:
Order Quest test #36596, freeze serum at -20C.
**Note:** Do not use test code WNVN (WNV NAT) or PTXID (Organ Donor Testing) when only West Nile Virus is ordered. Only use test code WNVS.

**Units:**
- Index

**Reference Interval:**
- **West Nile Virus IgG:**
  - Negative  &lt;1.30
  - Equivocal 1.30-1.49
  - Positive &gt;=1.50

- **West Nile Virus IgM:**
  - Negative &lt;0.90
  - Equivocal 0.90-1.10
  - Positive &gt;1.10

**Synonyms:**
- WNV

**Stability (from collection to initiation):**
- Room temperature 4 days, refrigerated 1 week, frozen @ -20°C 1 month, frozen @ -70°C indefinite

**Reflex Testing:**
- See 'Additional information'

**Additional Information:**
- West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, sera with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

**CPT Codes:**
- 86788-90, 86789-90

**LOINC Codes:**
- 36897-7
West Nile Virus Antibody, CSF
WNVC

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: ELISA
Reported: Test set up 3 days a week at night, reports in 5-7 days.

Additional Information:
West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, CSF samples with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

Reflex Testing:
See 'Additional information'

Synonyms:
• WNV

COLLECTION

Sample Type: CSF
Collect: CSF tube or sterile collection tube

Amount to Collect:
2 mL CSF
Preferred Volume:
2 mL CSF
Minimum Volume:
0.7 mL CSF

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen @ -20C 1 month, frozen @ -70C indefinite

PROCESSING

Test Code: WNVC
Test Group: WNV
Sendout: Yes
Performing Lab: Quest

Specimen Preparation:
Order Quest test #36597N, freeze CSF at -20C.
Preferred Volume:
2 mL CSF
Minimum Volume:
0.7 mL CSF

Stability (from collection to initiation):
RESULT INTERPRETATION

Units:
Index

Reference Interval:

West Nile Virus IgG, CSF:
Negative  <1.30
Equivocal 1.30-1.49
Positive   >=1.50

West Nile Virus IgM, CSF:
Negative  <0.90
Equivocal 0.90-1.10
Positive   >1.10

Additional Information:
West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, CSF samples with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

ADMINISTRATIVE

CPT Codes:
86788-90, 86789-90

COMPLETE VIEW

Available Stat:
No
Test Code:
WNVC
Test Group:
WNV
Performing Lab:
Quest
Sendout:
Yes
Methodology:
ELISA
Collect:
CSF tube or sterile collection tube
Amount to Collect:
2 mL CSF
Sample Type:
CSF
Preferred Volume:
2 mL CSF
Minimum Volume:
0.7 mL CSF
Specimen Preparation:
Order Quest test #36597N, freeze CSF at -20C.
Units:
Index
Reference Interval:
West Nile Virus IgG, CSF:
Negative  <1.30
Equivocal  1.30-1.49
Positive   >=1.50

West Nile Virus IgM, CSF:
Negative  <0.90
Equivocal  0.90-1.10
Positive   >1.10

Synonyms:
- WNV

Stability (from collection to initiation):
Room temperature 4 days, refrigerated 1 week, frozen @ -20C 1 month, frozen @ -70C indefinite

Reported:
Test set up 3 days a week at night, reports in 5-7 days.

Reflex Testing:
See 'Additional information'

Additional Information:
West Nile Virus (WNV) IgM antibodies, in blood or CSF, are positive in most infected people within 8 days of onset of symptoms and may remain detectable for months. In our laboratory, CSF samples with reactive IgM are rerun in a modified test to rule out nonspecific reactions. IgG antibodies indicate either current or past exposure to the virus.

CPT Codes:
86788-90, 86789-90
West Nile Virus Nucleic Acid Testing (NAT)  
PTXID

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Creative Testing Solutions

**Methodology:**
PCR

**Reported:**
Nucleic acid testing is sent out to BSL Monday to Friday evenings and results are available 48 hours after sent out. Test set up Monday through Saturday p.m. Turnaround time: 3-5 days

**Additional Information:**
As of December 2005, nucleic acid testing for blood donors is performed in pools of 16 donors, whereas testing for stem cell and organ donors is performed on individual samples (non-pooled). This is per current FDA regulations.

The assay for West Nile Virus included in the PTXID package detects WNV RNA and if the screen is reactive, IgG and IgM serologic testing is performed and additional molecular tests provided there is sufficient sample.

The test can only be ordered as part of the package PTXID.

**Synonyms:**
- WNV NAT
- PCR
- nucleic acid testing

**COLLECTION**

**Sample Type:**
EDTA whole blood

**Collect:**
Lavender top (6 mL size)

**Amount to Collect:**
6 mL blood

**Preferred Volume:**
6 mL blood

**Minimum Volume:**
5 mL blood

**Remarks:**
DO NOT draw samples for NAT send out on weekends and holidays or after 2 PM on Fridays.

For non-Transplant related testing on serum order test code WNV, for CSF testing order WNVC.

**Unacceptable Conditions:**
Samples collected outside of stated time frames

**PROCESSING**

**Test Code:**
Only orderable as package PTXID

**Test Group:**
WNV

**Sendout:**
Yes
Performing Lab:
Creative Testing Solutions

Specimen Preparation:
Ordered as part of the PTXID package. Samples must be received by BSL within 72 hours of collection. Keep at room temperature, DO NOT refrigerate or centrifuge sample.

Preferred Volume:
6 mL blood

Minimum Volume:
5 mL blood

Unacceptable Conditions:
Samples collected outside of stated time frames

RESULT INTERPRETATION

Reference Interval:
Non-reactive

Additional Information:
As of December 2005, nucleic acid testing for blood donors is performed in pools of 16 donors, whereas testing for stem cell and organ donors is performed on individual samples (non-pooled). This is per current FDA regulations.

The assay for West Nile Virus included in the PTXID package detects WNV RNA and if the screen is reactive, IgG and IgM serologic testing is performed and additional molecular tests provided there is sufficient sample.

The test can only be ordered as part of the package PTXID.

COMPLETE VIEW

Available Stat:
No

Test Code:
Only orderable as package PTXID

Test Group:
WNV

Performing Lab:
Creative Testing Solutions

Sendout:
Yes

Methodology:
PCR

Remarks:
DO NOT draw samples for NAT send out on weekends and holidays or after 2 PM on Fridays.

For non-Transplant related testing on serum order test code WNV, for CSF testing order WNVC.

Collect:
Lavender top (6 mL size)

Amount to Collect:
6 mL blood

Sample Type:
EDTA whole blood

Preferred Volume:
6 mL blood

Minimum Volume:
5 mL blood

Unacceptable Conditions:
Samples collected outside of stated time frames

Specimen Preparation:
Ordered as part of the PTXID package. Samples must be received by BSL within 72 hours of collection. Keep at room temperature, DO
NOT refrigerate or centrifuge sample.

**Reference Interval:**
Non-reactive

**Synonyms:**
- WNV NAT
- PCR
- nucleic acid testing

**Reported:**
Nucleic acid testing is sent out to BSL Monday to Friday evenings and results are available 48 hours after sent out. Test set up Monday
through Saturday p.m. Turnaround time: 3-5 days

**Additional Information:**
As of December 2005, nucleic acid testing for blood donors is performed in pools of 16 donors, whereas testing for stem cell and organ
donors is performed on individual samples (non-pooled). This is per current FDA regulations.

The assay for West Nile Virus included in the PTXID package detects WNV RNA and if the screen is reactive, IgG and IgM serologic
testing is performed and additional molecular tests provided there is sufficient sample.

The test can only be ordered as part of the package PTXID.
Western Equine Encephalitis Antibodies
WEEB

ORDERING

Available Stat: No
Performing Lab: Focus via Quest
Methodology: IFA
Reported: Performed 5x per week. Turnaround 3-5 days.

COLLECTION

Sample Type: Serum
Collect: Red top or Gold top
Amount to Collect: 2 mL blood
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 months.

PROCESSING

Test Code: WEEB
Sendout: Yes
Performing Lab: Focus via Quest
Specimen Preparation: Freeze serum at -20C. Order Quest test #37311X
Preferred Volume: 1 mL serum
Minimum Volume: 0.2 mL serum
Stability (from collection to initiation): Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 months.

RESULT INTERPRETATION

Units: Titer
Reference Interval: IgG: < 1:16 titer
                  IgM: < 1:20 titer
CPT Codes:
  86654-90 (x2)

LOINC Codes:
  17770-9

**Available Stat:**
No

**Test Code:**
WEEB

**Performing Lab:**
Focus via Quest

**Sendout:**
Yes

**Methodology:**
IFA

**Collect:**
Red top or Gold top

**Amount to Collect:**
2 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
0.2 mL serum

**Specimen Preparation:**
Freeze serum at -20C. Order Quest test #37311X

**Units:**
Titer

**Reference Interval:**
IgG: < 1:16 titer
IgM: < 1:20 titer

**Stability (from collection to initiation):**
Room temperature 1 week, refrigerated 2 weeks, frozen at -20C 1 months.

**Reported:**
Performed 5x per week. Turnaround 3-5 days.

**CPT Codes:**
86654-90 (x2)

**LOINC Codes:**
17770-9
White Blood Cell Differential  
CBCD, WBCDF

ORDERING

Available Stat:
Yes
Perfoming Lab:
Parnassus, Mission Bay & Mt. Zion Hematology
Performed:
Test available 24 hours per day 7 days per week
Reported:
Stat 1 hour, Routine 4 hours

Note: STAT differential turnaround time of greater than 1 hour may be seen if manual review of a sample is required

Additional Information:
All differential counts are routinely performed by automated flow cytometry.

Neutrophil Absolute Count (Total ANC) includes segmented neutrophils and bands. Immature granulocytes/left shift includes metamyelocytes and myelocytes.

A manual differential will be initiated by the laboratory at a separate charge if an automated differential is technically inadequate for the analysis of a particular sample.

Manual differentials also include RBC morphology and platelet morphology.

Synonyms:
- Eosophil
- Basophil
- Neutrophil
- Granulocyte
- Monocyte
- Lymphocyte
- Immature granulocyte
- Leukocyte differential
- WBC differential

COLLECTION

Sample Type:
EDTA whole blood
Collect:
Lavender top
Amount to Collect:
3 mL blood
Preferred Volume:
3 mL blood
Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

PROCESSING

Test Code:
CBCD, WBCDF
Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood (or 250 µL in a pedi-bullet)

RESULT INTERPRETATION

Units:
\( x10^9/L \)

Reference Interval:
Normal Absolute Counts in \( x10^9/L \):

<table>
<thead>
<tr>
<th>AGE</th>
<th>NEUTS</th>
<th>LYMPH</th>
<th>MONO</th>
<th>EO</th>
<th>BASO</th>
<th>IG</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-24 hours</td>
<td>5.0-28</td>
<td>2.0-12</td>
<td>0.4-3.1</td>
<td>0.0-0.9</td>
<td>0.0-0.6</td>
<td>0.0-0.3</td>
</tr>
<tr>
<td>24 hours-1 wk</td>
<td>1.5-21</td>
<td>2.0-17</td>
<td>0.3-2.7</td>
<td>0.1-1.1</td>
<td>0.0-0.3</td>
<td>0.0-0.3</td>
</tr>
<tr>
<td>1 wk-6 months</td>
<td>1.0-10</td>
<td>2.0-17</td>
<td>0.2-2.7</td>
<td>0.1-1.1</td>
<td>0.0-0.3</td>
<td>0.0-0.1</td>
</tr>
<tr>
<td>6 months -4 years</td>
<td>1.0-8.5</td>
<td>2.0-14</td>
<td>0.0-0.9</td>
<td>0.0-1.1</td>
<td>0.0-0.3</td>
<td>0.0-0.1</td>
</tr>
<tr>
<td>4-14 years</td>
<td>1.5-8.5</td>
<td>1.2-8.0</td>
<td>0.0-1.4</td>
<td>0.0-1.1</td>
<td>0.0-0.3</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>14-21 years</td>
<td>1.8-8.0</td>
<td>1.0-6.1</td>
<td>0.0-1.4</td>
<td>0.0-0.8</td>
<td>0.0-0.3</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>&gt;21 years</td>
<td>1.8-6.8</td>
<td>1.0-3.4</td>
<td>0.2-0.8</td>
<td>0.0-0.4</td>
<td>0.0-0.1</td>
<td>&lt;0.1</td>
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</table>

Critical Values:
Neutrophils \( \leq 1.0 \times 10^9/L \)

Note: Neutrophil counts \( \leq 1.0 \times 10^9/L \) are not called if a prior critical was reported in the preceding 24 hours

Additional Information:
All differential counts are routinely performed by automated flow cytometry.

Neutrophil Absolute Count (Total ANC) includes segmented neutrophils and bands. Immature granulocytes/left shift includes metamyelocytes and myelocytes.

A manual differential will be initiated by the laboratory at a separate charge if an automated differential is technically inadequate for the analysis of a particular sample.

Manual differentials also include RBC morphology and platelet morphology.

ADMINISTRATIVE

CPT Codes:
85004

COMPLETE VIEW

Available Stat:
Yes

Test Code:
CBCD, WBCDF

Performing Lab:
Parnassus, Mission Bay & Mt. Zion Hematology

Performed:
Test available 24 hours per day 7 days per week

Collect:
Lavender top

Amount to Collect:
3 mL blood

Sample Type:
EDTA whole blood

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
1 mL blood (or 250 µL in a pedi-bullet)

**Units:**
\( x10^9/L \)

**Reference Interval:**

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**Critical Values:**

Neutrophils \( \leq 1.0 \times 10^9/L \)

*Note: Neutrophil counts \( \leq 1.0 \times 10^9/L \) are not called if a prior critical was reported in the preceding 24 hours*

**Synonyms:**
- Eosinophil
- Basophil
- Neutrophil
- Granulocyte
- Monocyte
- Lymphocyte
- Immature granulocyte
- Leukocyte differential
- WBC differential

**Reported:**
Stat 1 hour, Routine 4 hours

*Note: STAT differential turnaround time of greater than 1 hour may be seen if manual review of a sample is required*

**Additional Information:**
All differential counts are routinely performed by automated flow cytometry.

Neutrophil Absolute Count (Total ANC) includes segmented neutrophils and bands. Immature granulocytes/left shift includes metamyelocytes and myelocytes.

A manual differential will be initiated by the laboratory at a separate charge if an automated differential is technically inadequate for the analysis of a particular sample.

Manual differentials also include RBC morphology and platelet morphology.

**CPT Codes:**
85004
Whole Blood Electrolytes
NLYTE, BLYTEG

ORDERING

Available Stat:
Yes

Performing Lab:
- Parnassus Chemistry
- Mission Bay Blood Gas Laboratory
- Mt Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
- Ion selective electrodes (ISE)
- Parnassus and Mission Bay: Radiometer ABL 800
- Mt Zion: Gem Premier 4000

COLLECTION

Sample Type:
Heparinized whole blood (Blood gas syringe only)

Collect:
Plastic syringe containing 100 U of dry heparin

Amount to Collect:
3 mL blood

Preferred Volume:
3 mL blood

Minimum Volume:
1 mL blood

Remarks:
Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterior tibial pulse is assessed and likewise if the posterior tibial approach is used the dorsalis pedis pulse is assessed. The modified Allens's test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

1. Palpate the radial artery and identify the site where the pulse is the strongest. Avoid areas with overlying veins to prevent venous admixture.
2. Prepare the patient's skin with an alcohol or 2% chlorhexidine wipe/swab.
3. Place two or three fingers along the course of the artery both to locate its position and direction, and to stabilize it.
4. Penetrate the skin smoothly holding the needle at 30-60 degree angle with the needle bevel up and pointed proximally. The angle of the "butterfly" IV catheter should not exceed 45° for pediatric patients.
5. Re-establish the position and direction of the artery by palpation.
6. Gently and slowly advance the needle or "butterfly", aiming directly for the area of maximum pulsation.
7. When the arterial lumen has been entered, less resistance is felt and blood appears in the syringe above the needle hub.
8. Obtain required amount of arterial blood for test(s):
9. If blood is not obtained on first attempt, withdraw the needle to just below the skin surface and advance needle at same angle but at 1 mm to either side of previous attempt.
10. Place the 2x2 gauze over the site of the puncture then withdraw the needle from the artery. Press firmly at the site for at least five minutes, or until the bleeding stops. Apply bandage or pressure dressing.
11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.
Venous samples:
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to the Chemistry Lab at Parnassus and the Hospital Lab at Mission Bay. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

**Stability (from collection to initiation):**

10 min.

---

**PROCESSING**

**Test Code:**
- NLYTE (Parnassus &MB): Na, K, Cl, iCa
- BLYTEG (MtZ): Na, K, iCa

**Performing Lab:**
- Parnassus Chemistry
- Mission Bay Blood Gas Laboratory
- Mt Zion Chemistry

**Specimen Preparation:**
Contains the following test codes: NAWB, CAIB, KSB

**Preferred Volume:**
3 mL blood

**Minimum Volume:**
1 mL blood

**Stability (from collection to initiation):**
10 min.

---

**RESULT INTERPRETATION**

**Units:**
mmol/L

**Reference Interval:**
- Sodium 136-146 mmol/L
- Potassium:
  - 0-6 months 3.0-5.4 mmol/L
  - > 6 months 3.4-4.5 mmol/L
- Chloride: 98-106 mmol/L

**Ionized Calcium:**
- 0-6 months 0.95-1.50 mmol/L
- > 6 months 1.15-1.29 mmol/L

**Critical Values:**
- Sodium 155 mmol/L
- Potassium 6.0 mmol/L
- Ionized Calcium 1.55 mmol/L

Note: Panic values from Post-filter samples are not phoned.

---

**ADMINISTRATIVE**

**LOINC Codes:**
Available Stat:
Yes

Test Code:
NLYTE (Parnassus & MB): Na, K, Cl, iCa
BLYTEG (MtZ): Na, K, iCa

Performing Lab:
Parnassus Chemistry
Mission Bay Blood Gas Laboratory
Mt Zion Chemistry

Performed:
Test available 24 hours per day 7 days per week

Methodology:
Ion selective electrodes (ISE)

Parnassus and Mission Bay: Radiometer ABL 800
Mt Zion: Gem Premier 4000

Remarks:
Arterial puncture:
Due to the risk of arterial damage and subsequent distal ischemia, prior to puncturing an artery the RN assesses the collateral circulation. If the radial artery is to be punctured, then the pulse of the ulnar artery is assessed. If the dorsalis pedis artery is to be accessed then the posterial tibial pulse is assessed and likewise if the posterial tibial approach is used the dorsalis pedis pulse is assessed. The modified Allens's test may be used to assess collateral circulation of the ulnar artery before a radial artery puncture, but it does not always ensure adequate flow. A Doppler ultrasound flow indicator may be used to verify collateral circulation. If the collateral circulation is poor and the RN cannot palpate a pulse then the physician should be notified before proceeding. If for any reason the circulation is compromised to the extremity being assessed for arterial puncture then the physician should be notified prior to proceeding.

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11. Expel any air bubble in the syringe with air filter cap placed on specimen syringe.
12. Label sample with patient's name, ID number and DOB.

Venous samples:
1. Avoid excessive venous stasis from prolonged tourniquet application or clenching of the fist prior to sample collection.
2. For central line draws make sure to waste a full red top tube then draw via the blood gas syringe as noted above.
3. Fill syringe completely, remove needle (in peripheral draws), cap sample, expel all bubbles (while holding syringe upright) until blood hits the top of cap.
4. Label sample with patient's name, ID number and DOB.

Deliver samples immediately to lab for testing. Send samples via pneumatic tube to the Chemistry Lab at Parnassus and the Hospital Lab at Mission Bay. Hand deliver samples to Mount Zion Lab, B bldg, second floor.

Collect:
Plastic syringe containing 100 U of dry heparin

Amount to Collect:
3 mL blood
Sample Type:
  Heparinized whole blood (Blood gas syringe only)

Preferred Volume:
  3 mL blood

Minimum Volume:
  1 mL blood

Specimen Preparation:
  Contains the following test codes: NAWB, CAIB, KSB

Units:
  mmol/L

Reference Interval:
  Sodium 136-146 mmol/L

  Potassium:
  0-6 months 3.0-5.4 mmol/L
  > 6 months 3.4-4.5 mmol/L

  Chloride: 98-106 mmol/L

  Ionized Calcium:
  0-6 months 0.95-1.50 mmol/L
  > 6 months 1.15-1.29 mmol/L

Critical Values:
  Sodium  155 mmol/L
  Potassium 6.0 mmol/L
  Ionized Calcium 1.55 mmol/L

  Note: Panic values from Post-filter samples are not phoned.

Stability (from collection to initiation):
  10 min.

LOINC Codes:
  55231-5
XX/XY FISH
XXXY, BXXXY

ORDERING

Available Stat:
No
Performing Lab:
Medical Genomics - Cytogenetics
Methodology:
Fluorescent in-situ hybridization
Synonyms:
• Sex mismatch
• Transplant monitoring
• TX monitoring
• XXXY
• BXXXY

COLLECTION

Sample Type:
Heparinized whole blood, bone marrow, bone core, Amniotic fluid, CVS, POC
Collect:
Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics. Dark Green top also acceptable
Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.
Amount to Collect:
See preferred volume.
Preferred Volume:
Bone marrow: 2 mL
Blood: 3 mL
Bone core: 2 cm
Amniotic fluid: 10 mL
CVS: 10 mg
POC: 10 mg
Minimum Volume:
Bone marrow: 1 mL
Blood: 1 mL
Bone core: 1 cm
Amniotic fluid: 5 mL
CVS: 5 mg
POC: 5 mg
Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

PROCESSING

Test Code:
BXXXY: Blood
XXXY: Bone marrow
Test Group:
FISH
Performing Lab:
Specimen Preparation:
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 3 mL
- Bone core: 2 cm
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

Minimum Volume:
- Bone marrow: 1 mL
- Blood: 1 mL
- Bone core: 1 cm
- Amniotic fluid: 5 mL
- CVS: 5 mg
- POC: 5 mg

Unacceptable Conditions:
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

CPT Codes:
88275, 88271

LDT or Modified FDA:
Yes

Complete View

Available Stat:
No

Test Code:
- BXXXY: Blood
- XXXY: Bone marrow

Test Group:
FISH

Performing Lab:
Medical Genomics - Cytogenetics

Methodology:
Fluorescent in-situ hybridization

Collect:
- Blood & bone marrow aspirate: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics. Dark Green top also acceptable
- Bone marrow core: 15 mL centrifuge tube with transport media (RPMI, FBS, L-Glutamine, Sodium Heparin and PenStrep). Available from Cytogenetics.

Amount to Collect:
See preferred volume.

Sample Type:
Heparinized whole blood, bone marrow, bone core, Amniotic fluid, CVS, POC

Preferred Volume:
- Bone marrow: 2 mL
- Blood: 3 mL
- Bone core: 2 cm
- Amniotic fluid: 10 mL
- CVS: 10 mg
- POC: 10 mg

Minimum Volume:
Bone marrow: 1 mL  
Blood: 1 mL  
Bone core: 1 cm  
Amniotic fluid: 5 mL  
CVS: 5 mg  
?POC: 5 mg

**Unacceptable Conditions:**  
Insufficient volume; unlabeled tubes; clotted samples; broken, leaking or contaminated tubes; frozen samples.

**Specimen Preparation:**  
Maintain sample at room temperature. Transport to CB Cytogenetics within 24 hours

**Synonyms:**
- Sex mismatch
- Transplant monitoring
- TX monitoring
- XXXY
- BXXXY

**CPT Codes:**
- 88275, 88271

**LDT or Modified FDA:**
- Yes
Y Chromosome Microdeletion
YCMD

ORDERING
Performing Lab:
Quest
Methodology:
Agarose Gel Electrophoresis • Polymerase Chain Reaction (PCR)
Reported:
3-7 days
Additional Information:
To detect Y chromosome microdeletions associated with oligospermia and azoospermia. About 15-20% of azoospermic men and about 10% of severely oligospermic men present with microdeletions of Yq. This test targets 20 genetic loci, including those recommended by the European Quality Monitoring Network Group (Int J Andr 22: 292-299 (1999)).

COLLECTION
Sample Type:
Whole Blood
Collect:
Lavender top or dark green top tube
Amount to Collect:
4 mL
Preferred Volume:
4 mL
Minimum Volume:
3 mL
Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable

PROCESSING
Test Code:
YCMD
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Do not aliquot. Transport to CB ambient. Order Quest test code 14679
Preferred Volume:
4 mL
Minimum Volume:
3 mL
Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable

RESULT INTERPRETATION
Additional Information:

To detect Y chromosome microdeletions associated with oligospermia and azoospermia. About 15-20% of azoospermic men and about 10% of severely oligospermic men present with microdeletions of Yq. This test targets 20 genetic loci, including those recommended by the European Quality Monitoring Network Group (Int J Andr 22: 292-299 (1999)).

ADMINISTRATIVE

CPT Codes:
81403-90

LOINC Codes:
35456-3

COMPLETE VIEW

Test Code:
YCMD

Performing Lab:
Quest

Sendout:
Yes

Methodology:
Agarose Gel Electrophoresis • Polymerase Chain Reaction (PCR)

Collect:
Lavender top or dark green top tube

Amount to Collect:
4 mL

Sample Type:
Whole Blood

Preferred Volume:
4 mL

Minimum Volume:
3 mL

Specimen Preparation:
Do not aliquot. Transport to CB ambient. Order Quest test code 14679

Stability (from collection to initiation):
Room temperature: 8 days
Refrigerated: 8 days
Frozen: Unacceptable

Reported:
3-7 days

Additional Information:

To detect Y chromosome microdeletions associated with oligospermia and azoospermia. About 15-20% of azoospermic men and about 10% of severely oligospermic men present with microdeletions of Yq. This test targets 20 genetic loci, including those recommended by the European Quality Monitoring Network Group (Int J Andr 22: 292-299 (1999)).

CPT Codes:
81403-90

LOINC Codes:
35456-3
Yersinia only Culture
P158

ORDERING

Approval Required:
Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x3-1268

Available Stat:
No

Performing Lab:
Microbiology

Performed:
Set up daily, day and evening shifts

Methodology:
Culture

Reported:
2-3 days

Synonyms:
Bacterial culture

COLLECTION

Sample Type:
Stool

Collect:
Urine cup or C & S (Cary & Blair) transport media

Amount to Collect:
5 mL

Preferred Volume:
5 mL

Minimum Volume:
Fresh stool : 0.5 mL or size of pea, Stool in C & S (Cary & Blair) transport medium: 5 mL

Remarks:
Submit unpreserved stool to laboratory within 3 hours of collection.

If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C &S (Cary &Blair) Medium. Add stool to red line on vial and mix well with spoon.

C &S (Cary &Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories’ draw stations. For patient collect samples, order PMM 68902 C &S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C &S Medium 2805-05 (without bag or instructions) also available.

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week

Unacceptable Conditions:
Unpreserved stool received > 3 hours after collection. More than two samples per day.

PROCESSING

Test Code:
P158

Test Group:
Yersinia

Performing Lab:
Microbiology

Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.

Incubate CIN plate at ROOM TEMPERATURE.

**Preferred Volume:**
5 mL

**Minimum Volume:**
- Fresh stool: 0.5 mL or size of pea
- Stool in C & S (Cary & Blair) transport medium: 5 mL

**Unacceptable Conditions:**
- Unpreserved stool received > 3 hours after collection.
- More than two samples per day.

**Stability (from collection to initiation):**
- Unpreserved 3 hours, preserved 1 week

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**ADMINISTRATIVE**

**CPT Codes:**
- 87046

**LOINC Codes:**
- 28549-4

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**COMPLETE VIEW**

**Approval Required:**
- Yes, consultation required for samples submitted > 72 hours after inpatient admission. Contact Microbiology at x3-1268

**Available Stat:**
- No

**Test Code:**
- P158

**Test Group:**
- Yersinia

**Performing Lab:**
- Microbiology

**Performed:**
- Set up daily, day and evening shifts

**Methodology:**
- Culture

**Remarks:**
- Submit unpreserved stool to laboratory within 3 hours of collection.

- If specimen will be submitted to the laboratory more than 3 hours after collection, or after 11 pm when Microbiology is closed, submit stool in C & S (Cary & Blair) Medium. Add stool to red line on vial and mix well with spoon.

- C & S (Cary & Blair) Medium is available from Material Services. Outpatients can obtain these from the laboratories’ draw stations. For patient collect samples, order PMM 68902 C & S Medium Cary Blair 2805-05-WB (with bag and instructions). PMM 49206 C & S Medium 2805-05 (without bag or instructions) also available.

**Collect:**
- Urine cup or C & S (Cary & Blair) transport media

**Amount to Collect:**
- 5 mL

**Sample Type:**
- Stool

**Preferred Volume:**
- 5 mL

**Minimum Volume:**
- Fresh stool: 0.5 mL or size of pea

**Unacceptable Conditions:**
- Unpreserved stool received > 3 hours after collection. More than two samples per day.
Specimen Preparation:
If < 5mL stool received, add 3 parts Cary & Blair medium to 1 part stool.
Incubate CIN plate at ROOM TEMPERATURE.

Synonyms:
- Bacterial culture

Stability (from collection to initiation):
Unpreserved 3 hours, preserved 1 week

Reported:
2-3 days

CPT Codes:
87046

LOINC Codes:
28549-4
ZIKA VIRUS AB (IGM)
ZIKM

ORDERING

Performing Lab:
Quest (Focus Diagnostics)

Methodology:
Immunoassay

Reported:
3-5 days

Additional Information:
Testing should only be performed on individuals meeting Centers for Disease Control and Prevention (CDC) Zika virus clinical criteria (e.g., clinical signs and symptoms associated with Zika virus infection) and/or CDC Zika virus epidemiological criteria (e.g., history of residence in, or travel to a geographic region with active Zika transmission at the time of travel, or other epidemiologic criteria for which Zika virus testing may be indicated, such as possible sexual transmission). Most people with Zika virus infection are asymptomatic. Symptomatic individuals typically experience a mild illness characterized by fever, joint pain, rash, or conjunctivitis. Clinical illness is usually self-limited and lasts a week or less. Not all symptomatic patients report all of these clinical findings, and Zika manifestations overlap significantly with those seen in other viral infections. The incubation period is unclear, but likely to be several days. Symptoms generally resolve on their own within a week.

Synonyms:
- Zika virus antibody
- Zika IgM
- Zika antibody level

COLLECTION

Sample Type:
Serum

Collect:
Preferred: Gold top
Acceptable: Red top

Amount to Collect:
6 mL blood

Preferred Volume:
3 mL serum

Minimum Volume:
1 mL serum

Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: 48 hours
Frozen: 30 days

Rejection Criteria:
Serum received in spun SST.

PROCESSING

Test Code:
ZIKM

Sendout:
Yes

Performing Lab:
Quest (Focus Diagnostics)

Specimen Preparation:
Aliquot and freeze. Transport to CB frozen. Order Quest test code 94264.
**Preferred Volume:**
3 mL serum

**Minimum Volume:**
1 mL serum

**Rejection Criteria:**
Serum received in spun SST.

**Stability (from collection to initiation):**
- Room temperature: Unacceptable
- Refrigerated: 48 hours
- Frozen: 30 days

---

**RESULT INTERPRETATION**

**Additional Information:**
Testing should only be performed on individuals meeting Centers for Disease Control and Prevention (CDC) Zika virus clinical criteria (e.g., clinical signs and symptoms associated with Zika virus infection) and/or CDC Zika virus epidemiological criteria (e.g., history of residence in, or travel to a geographic region with active Zika transmission at the time of travel, or other epidemiologic criteria for which Zika virus testing may be indicated, such as possible sexual transmission). Most people with Zika virus infection are asymptomatic. Symptomatic individuals typically experience a mild illness characterized by fever, joint pain, rash, or conjunctivitis. Clinical illness is usually self-limited and lasts a week or less. Not all symptomatic patients report all of these clinical findings, and Zika manifestations overlap significantly with those seen in other viral infections. The incubation period is unclear, but likely to be several days. Symptoms generally resolve on their own within a week.

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**ADMINISTRATIVE**

**CPT Codes:**
- 86790-90

**LOINC Codes:**
- 80824-6

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**COMPLETE VIEW**

**Test Code:**
ZIKM

**Performing Lab:**
Quest (Focus Diagnostics)

**Sendout:**
Yes

**Methodology:**
Immonoassay

**Collect:**
- Preferred: Gold top
- Acceptable: Red top

**Amount to Collect:**
- 6 mL blood

**Sample Type:**
Serum

**Preferred Volume:**
3 mL serum

**Minimum Volume:**
1 mL serum

**Rejection Criteria:**
Serum received in spun SST.

**Specimen Preparation:**
- Aliquot and freeze. Transport to CB frozen. Order Quest test code 94264.

**Synonyms:**

- Zika virus antibody
- Zika IgM
- Zika antibody level

**Stability (from collection to initiation):**
- Room temperature: Unacceptable
- Refrigerated: 48 hours
- Frozen: 30 days

**Reported:**
- 3-5 days

**Additional Information:**
Testing should only be performed on individuals meeting Centers for Disease Control and Prevention (CDC) Zika virus clinical criteria (e.g., clinical signs and symptoms associated with Zika virus infection) and/or CDC Zika virus epidemiological criteria (e.g., history of residence in, or travel to a geographic region with active Zika transmission at the time of travel, or other epidemiologic criteria for which Zika virus testing may be indicated, such as possible sexual transmission). Most people with Zika virus infection are asymptomatic. Symptomatic individuals typically experience a mild illness characterized by fever, joint pain, rash, or conjunctivitis. Clinical illness is usually self-limited and lasts a week or less. Not all symptomatic patients report all of these clinical findings, and Zika manifestations overlap significantly with those seen in other viral infections. The incubation period is unclear, but likely to be several days. Symptoms generally resolve on their own within a week.

**CPT Codes:**
- 86790-90

**LOINC Codes:**
- 80824-6
ZIKA VIRUS RNA, SERUM/URINE
ZIKR

ORDERING

Performing Lab:
Quest
Methodology:
Real-Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)
Reported:
3-5 days
Additional Information:
Zika virus RNA may be detected in serum for approximately 4-7 days following onset of symptoms; but may be detected longer in a pregnant woman, thus the optimum time to perform serum RNA testing is during the first week after the onset of clinical illness in non-pregnant patients. During pregnancy, the duration of viremia and/or viruria may be prolonged. Evidence suggests that pregnant women may have detectable virus in serum for up to 14 days or longer, therefore PCR testing is recommended at least up to 14 days or longer in a pregnant woman. Optimal time for testing urine is within 14 days of symptoms. For patients who are 2-12 weeks post-symptom onset, serologic testing should be considered. Test results should be used in conjunction with clinical signs and symptoms, epidemiological information and relevant travel history to diagnose Zika virus infection.
Synonyms:
- ZIKA PCR

COLLECTION

Sample Type:
Urine and serum
Collect:
Sterile container AND Gold-top/Red-top tube
Amount to Collect:
3 mL
Preferred Volume:
3 mL
Minimum Volume:
0.6 mL
Remarks:
Test requires both a serum and urine collection.
Stability (from collection to initiation):
Room temperature: Unacceptable
Refrigerated: 7 days
Frozen: Unacceptable
Rejection Criteria:
- Heparinized specimens • Specimens in leaking, uncapped or broken containers • Specimens exceeding stability • Non-validated specimen types • Serum received in spun SST®

PROCESSING

Test Code:
ZIKR
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Aliquot both serum and urine. Send both samples refrigerated to CB. Order Quest test code 94221.
Preferred Volume:
3 mL
Minimum Volume:
0.6 mL

Rejection Criteria:
- Heparinized specimens
- Specimens in leaking, uncapped or broken containers
- Specimens exceeding stability
- Non-validated specimen types
- Serum received in spun SST®

Stability (from collection to initiation):
- Room temperature: Unacceptable
- Refrigerated: 7 days
- Frozen: Unacceptable

RESULT INTERPRETATION

Reference Interval:
- Not Detected

Additional Information:
Zika virus RNA may be detected in serum for approximately 4-7 days following onset of symptoms; but may be detected longer in a pregnant woman, thus the optimum time to perform serum RNA testing is during the first week after the onset of clinical illness in non-pregnant patients. During pregnancy, the duration of viremia and/or viruria may be prolonged. Evidence suggests that pregnant women may have detectable virus in serum for up to 14 days or longer, therefore PCR testing is recommended at least up to 14 days or longer in a pregnant woman. Optimal time for testing urine is within 14 days of symptoms. For patients who are 2-12 weeks post-symptom onset, serologic testing should be considered. Test results should be used in conjunction with clinical signs and symptoms, epidemiological information and relevant travel history to diagnose Zika virus infection.

ADMINISTRATIVE

CPT Codes:
- 87798x2

LOINC Codes:
- 79190-5

COMPLETE VIEW

Test Code:
- ZIKR

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Real-Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR)

Remarks:
- Test requires both a serum and urine collection.

Collect:
- Sterile container AND Gold-top/Red-top tube

Amount to Collect:
- 3 mL

Sample Type:
- Urine and serum

Preferred Volume:
- 3 mL

Minimum Volume:
- 0.6 mL

Rejection Criteria:
- Heparinized specimens
- Specimens in leaking, uncapped or broken containers
- Specimens exceeding stability
- Non-validated specimen types
- Serum received in spun SST®
Specimen Preparation:
Aliquot both serum and urine. Send both samples refrigerated to CB. Order Quest test code 94221.

Reference Interval:
Not Detected

Synonyms:
- ZIKA PCR

Stability (from collection to initiation):
- Room temperature: Unacceptable
- Refrigerated: 7 days
- Frozen: Unacceptable

Reported:
3-5 days

Additional Information:
Zika virus RNA may be detected in serum for approximately 4-7 days following onset of symptoms; but may be detected longer in a pregnant woman, thus the optimum time to perform serum RNA testing is during the first week after the onset of clinical illness in non-pregnant patients. During pregnancy, the duration of viremia and/or viruria may be prolonged. Evidence suggests that pregnant women may have detectable virus in serum for up to 14 days or longer, therefore PCR testing is recommended at least up to 14 days or longer in a pregnant woman. Optimal time for testing urine is within 14 days of symptoms. For patients who are 2-12 weeks post-symptom onset, serologic testing should be considered. Test results should be used in conjunction with clinical signs and symptoms, epidemiological information and relevant travel history to diagnose Zika virus infection.

CPT Codes:
- 87798x2

LOINC Codes:
- 79190-5
Zinc Protoporphyrin (ZPP), Whole Blood

ORDERING

Ordering Recommendations:
Useful as an indicator of chronic exposure to lead, primarily in the industrial setting. For iron deficiency assessment, Iron and Iron Binding Capacity (0020420) and Ferritin (0070065) are recommended. For lead exposure assessment, Lead Blood (Venous) (0020098) is preferred. For occupational exposure to lead assessment, Zinc Protoporphyrin (ZPP) Whole Blood Industrial (0020614) or Lead Industrial Exposure Panel, Adults (0025016) are recommended.

Performing Lab:
ARUP

Performed:
Mon-Fri

Methodology:
Quantitative Hematofluorometry

Reported:
1-4 days

Synonyms:
- Porphyrs
- ZP
- ZPP
- ZPP/Heme Ratio

COLLECTION

Collect:
Lavender (EDTA); Royal blue, (EDTA), tan (EDTA), or pink (K2 EDTA). Use royal blue (EDTA) tube when also testing for lead.

Stability (from collection to initiation):
Ambient: 30 hours; Refrigerated: 5 weeks; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.

Unacceptable Conditions:
Specimens not collected in EDTA. Clotted, frozen, or hemolyzed specimens.

PROCESSING

Test Code:
ZNPP

ARUP Test Code:
0020605

Sendout:
Yes

Performing Lab:
ARUP

Specimen Preparation:
Transport 1 mL whole blood. (Min: 0.2 mL)

Unacceptable Conditions:
Specimens not collected in EDTA. Clotted, frozen, or hemolyzed specimens.

Stability (from collection to initiation):
Ambient: 30 hours; Refrigerated: 5 weeks; Frozen: Unacceptable

Storage/Transport Temperature:
Refrigerated.
result interpretation

Reference Interval:

0-69 µmol ZPP/ mol Hem

administrative

CPT Codes:

84202

complete view

Ordering Recommendations:

Useful as an indicator of chronic exposure to lead, primarily in the industrial setting. For iron deficiency assessment, Iron and Iron Binding Capacity (0020420) and Ferritin (0070065) are recommended. For lead exposure assessment, Lead Blood (Venous) (0020098) is preferred. For occupational exposure to lead assessment, Zinc Protoporphyrin (ZPP) Whole Blood Industrial (0020614) or Lead Industrial Exposure Panel, Adults (0025016) are recommended.

Test Code:

ZNPP

ARUP Test Code:

0020605

Performing Lab:

ARUP

Sendout:

Yes

Performed:

Mon-Fri

Methodology:

Quantitative Hematofluorometry

Collect:

Lavender (EDTA); Royal blue, (EDTA), tan (EDTA), or pink (K2 EDTA). Use royal blue (EDTA) tube when also testing for lead.

Unacceptable Conditions:

Specimens not collected in EDTA. Clotted, frozen, or hemolyzed specimens.

Specimen Preparation:

Transport 1 mL whole blood. (Min: 0.2 mL)

Reference Interval:

0-69 µmol ZPP/ mol Hem

Synonyms:

- Porphyrins
- ZP
- ZPP
- ZPP/Heme Ratio

Storage/Transport Temperature:

Refrigerated.

Stability (from collection to initiation):

Ambient: 30 hours; Refrigerated: 5 weeks; Frozen: Unacceptable

Reported:

1-4 days

CPT Codes:

84202

Notes:

Elevated ZPP results are seen in early and late iron deficiency, the anemia of chronic disease, chronic lead poisoning, and erythropoietic protoporphyria. Elevated bilirubin or riboflavin and hemolyzed, clotted, or improperly aliquoted specimens may falsely
increase the ZPP concentration.

A more specific test for free protoporphyrin is Porphyrins, Serum Total (0080429). Erythrocyte Porphyrin (EP), Whole Blood (0020610), measures free protoporphyrin and zinc protoporphyrin.
Zinc Transporter 8 Antibody
ZNT8

ORDERING

Available Stat:
No
Performing Lab:
Quest
Methodology:
ELISA
Reported:
3-5 days
Synonyms:
- Autoimmune Diabetes

COLLECTION

Sample Type:
Serum
Collect:
Gold top or Red top
Amount to Collect:
2 mL blood
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Stability (from collection to initiation):
- Room temperature or refrigerated 1 week, frozen 4 weeks.

Unacceptable Conditions:
- Gross Hemolysis; Lipemia; Icterus; specimens other than serum

Rejection Criteria:
- Gross Hemolysis; Lipemia; Icterus; specimens other than serum

PROCESSING

Test Code:
ZNT8
Sendout:
Yes
Performing Lab:
Quest
Specimen Preparation:
Centrifuge and aliquot. Freeze. Send to CB frozen. Order Quest test code 93022
Preferred Volume:
1 mL serum
Minimum Volume:
0.5 mL serum
Unacceptable Conditions:
- Gross Hemolysis; Lipemia; Icterus; specimens other than serum

Rejection Criteria:
- Gross Hemolysis; Lipemia; Icterus; specimens other than serum
Stability (from collection to initiation):
   Room temperature or refrigerated 1 week, frozen 4 weeks.

RESULT INTERPRETATION

Units:
   U/mL
Reference Interval:
   <15 U/mL

ADMINISTRATIVE

CPT Codes:
   86341-90

COMPLETE VIEW

Available Stat:
   No
Test Code:
   ZNT8
Performing Lab:
   Quest
Sendout:
   Yes
Methodology:
   ELISA
Collect:
   Gold top or Red top
Amount to Collect:
   2 mL blood
Sample Type:
   Serum
Preferred Volume:
   1 mL serum
Minimum Volume:
   0.5 mL serum
Rejection Criteria:
   Gross Hemolysis; Lipemia; Icterus; specimens other than serum
Unacceptable Conditions:
   Gross Hemolysis; Lipemia; Icterus; specimens other than serum
Specimen Preparation:
   Centrifuge and aliquot. Freeze. Send to CB frozen. Order Quest test code 93022
Units:
   U/mL
Reference Interval:
   <15 U/mL
Synonyms:
   - Autoimmune Diabetes
Stability (from collection to initiation):
   Room temperature or refrigerated 1 week, frozen 4 weeks.
Reported:
   3-5 days
CPT Codes:
Zinc, 24 hour urine
ZINU

ORDERING

Available Stat: No
Performing Lab: Quest
Methodology: Atomic Absorption Spectroscopy
Reported: Test run Monday-Saturday. Turnaround time: 3-6 days.
Additional Information: To convert µg/L to µmol/L (SI units) multiply by 0.0153.

COLLECTION

Sample Type: 24 hour urine collection
Collect: Acid washed 24 hour urine collection container
Amount to Collect: Entire 24 hour urine output
Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Stability (from collection to initiation): Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.
Rejection Criteria: Hemolysis or fecal contamination

PROCESSING

Test Code: ZINU
Test Group: Zinc
Sendout: Yes
Performing Lab: Quest
Specimen Preparation: Follow the detailed processing instructions for Trace Metal Analysis.

24 hour urine: After collection, be sure the urine is mixed well before transferring to the shipping container. To avoid contamination, carefully pour the designated amount of urine directly from the collection container into the acid wash shipping container. Prepare two (2) aliquots. Save (1) in storage rack. Discard after 1 week. Measure the remaining volume of urine AFTER the aliquot is taken and add volume of aliquots for total 24 hour urine volume or weigh the entire 24 hour collection, record total volume, then aliquot into acid washed shipping container. Freeze at -20C. Order Quest # 946.

Preferred Volume: 7 mL urine
Minimum Volume: 3 mL urine
Rejection Criteria:
- Hemolysis or fecal contamination

Stability (from collection to initiation):
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

RESULT INTERPRETATION

Units:
- µg/24 hours

Reference Interval:
- 100-1200 µg/24 hours

Additional Information:
- To convert µg/L to µmol/L (SI units) multiply by 0.0153.

ADMINISTRATIVE

CPT Codes:
- 84630-90

LOINC Codes:
- 5765-3

COMPLETE VIEW

Available Stat:
- No

Test Code:
- ZINU

Test Group:
- Zinc

Performing Lab:
- Quest

Sendout:
- Yes

Methodology:
- Atomic Absorption Spectroscopy

Collect:
- Acid washed 24 hour urine collection container

Amount to Collect:
- Entire 24 hour urine output

Sample Type:
- 24 hour urine collection

Preferred Volume:
- 7 mL urine

Minimum Volume:
- 3 mL urine

Rejection Criteria:
- Hemolysis or fecal contamination

Specimen Preparation:
- Follow the detailed processing instructions for Trace Metal Analysis.

24 hour urine: After collection, be sure the urine is mixed well before transferring to the shipping container. To avoid contamination, carefully pour the designated amount of urine directly from the collection container into the acid wash shipping container. Prepare two (2) aliquots. Save (1) in storage rack. Discard after 1 week. Measure the remaining volume of urine AFTER the aliquot is taken and add volume of aliquots for total 24 hour urine volume or weigh the entire 24 hour collection, record total volume, then aliquot into acid washed shipping container. Freeze at -20C. Order Quest # 946.
Units:
μg/24 hours

Reference Interval:
100-1200 μg/24 hours

Stability (from collection to initiation):
Room temperature 5 days, refrigerated 2 weeks, frozen at -20°C 1 month.

Reported:
Test run Monday-Saturday. Turnaround time: 3-6 days.

Additional Information:
To convert μg/L to μmol/L (SI units) multiply by 0.0153.

CPT Codes:
84630-90

LOINC Codes:
5765-3
Zinc, plasma

ZINC

ORDERING

Available Stat:
No
Performing Lab:
UC Irvine
Methodology:
Inductively Coupled Plasma Mass Spectroscopy (ICPMS)
Reported:
3-7 days.

COLLECTION

Patient Preparation:
The patient should refrain from taking vitamins or mineral supplements for at least 3 days prior to specimen collection.
Sample Type:
EDTA plasma
Collect:
Navy blue top (EDTA) tube
Amount to Collect:
4 mL blood
Preferred Volume:
1 mL plasma
Minimum Volume:
0.6 mL plasma
Remarks:
Because Zinc levels display a circadian rhythm which peaks at 0900 and 1800, specimens should always be drawn at the same time of day. Be sure to gently mix the specimen promptly after phlebotomy.
Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen at -20C 6 months.
Unacceptable Conditions:
Collected in Gold top. Moderate to gross hemolysis.
Rejection Criteria:
Hemolysis

PROCESSING

Test Code:
ZINC
Test Group:
Zinc
Sendout:
Yes
Performing Lab:
UC Irvine
Specimen Preparation:
Centrifuge the tube at 1000G for 10 minutes, separate plasma from cells within 2 hours of collection, pour the plasma into a plastic trace element shipping container and ship to China Basin sendouts frozen.
Preferred Volume:
1 mL plasma
Minimum Volume:
0.6 mL plasma

**Unacceptable Conditions:**
Collected in Gold top. Moderate to gross hemolysis.

**Rejection Criteria:**
Hemolysis

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 6 months.

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**RESULT INTERPRETATION**

**Units:**
µg/dL (mcg/dL)

**Reference Interval:**
55 - 150 µg/dL (mcg/dL)

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**ADMINISTRATIVE**

**CPT Codes:**
84630-90

**LOINC Codes:**
5763-8

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**COMPLETE VIEW**

**Available Stat:**
No

**Test Code:**
ZINC

**Test Group:**
Zinc

**Performing Lab:**
UC Irvine

**Sendout:**
Yes

**Methodology:**
Inductively Coupled Plasma Mass Spectroscopy (ICPMS)

**Patient Preparation:**
The patient should refrain from taking vitamins or mineral supplements for at least 3 days prior to specimen collection.

**Remarks:**
Because Zinc levels display a circadian rhythm which peaks at 0900 and 1800, specimens should always be drawn at the same time of day. Be sure to gently mix the specimen promptly after phlebotomy.

**Collect:**
Navy blue top (EDTA) tube

**Amount to Collect:**
4 mL blood

**Sample Type:**
EDTA plasma

**Preferred Volume:**
1 mL plasma

**Minimum Volume:**
0.6 mL plasma

**Rejection Criteria:**
Hemolysis

**Unacceptable Conditions:**
Collected in Gold top. Moderate to gross hemolysis.
Specimen Preparation:
Centrifuge the tube at 1000G for 10 minutes, separate plasma from cells within 2 hours of collection, pour the plasma into a plastic trace element shipping container and ship to China Basin sendouts frozen.

Units:
µg/dL (mcg/dL)

Reference Interval:
55 - 150 µg/dL (mcg/dL)

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 6 months.

Reported:
3-7 days.

CPT Codes:
84630-90

LOINC Codes:
5763-8
**Zinc, random urine**

ZINUR

**ORDERING**

Available Stat:

No

Performing Lab:

Quest

Methodology:

Inductively-Coupled Plasma / Mass Spectrometry

Reported:

Set up 5x per week. Turn around 5-7 days.

Additional Information:

Zinc is an essential element involved in a myriad of enzyme systems including wound healing, immune function, and fetal development. Zinc measurements are used to detect and monitor industrial, dietary, and accidental exposure to zinc. Also, Zinc measurements may be used to evaluate health and monitor response to treatment.

Synonyms:

- Zn

**COLLECTION**

Patient Preparation:

Patient should refrain from taking vitamins or mineral supplements at least 3 days prior to sample collection.

Sample Type:

Random urine, second voided AM preferred

Collect:

Urine cup

Amount to Collect:

10 mL urine

Preferred Volume:

7 mL urine

Minimum Volume:

2 mL urine

Stability (from collection to initiation):

Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

Rejection Criteria:

Grossly decomposed urine. hemolysis or fecal contamination. Use of metal based preservative.

**PROCESSING**

Test Code:

ZINUR

Test Group:

Zinc

Sendout:

Yes

Performing Lab:

Quest

Specimen Preparation:

Aliquot 7 mL. Store and transport sample at refrigerated. Order Quest #16502

Preferred Volume:

7 mL urine

Minimum Volume:
2 mL urine

**Rejection Criteria:**
- Grossly decomposed urine, hemolysis or fecal contamination. Use of metal based preservative.

**Stability (from collection to initiation):**
- Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

---

### RESULT INTERPRETATION

**Units:**
- µg/g Creatinine (mcg/g Creatinine)

**Reference Interval:**
- 2nd voided urine in non-exposed >= 18 year old: 100-810 µg/g creatinine

**Additional Information:**
- Zinc is an essential element involved in a myriad of enzyme systems including wound healing, immune function, and fetal development.
- Zinc measurements are used to detect and monitor industrial, dietary, and accidental exposure to zinc. Also, Zinc measurements may be used to evaluate health and monitor response to treatment.

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### ADMINISTRATIVE

**CPT Codes:**
- 82570-90, 84630-90

**LOINC Codes:**
- 13473-4

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### COMPLETE VIEW

**Available Stat:**
- No

**Test Code:**
- ZINUR

**Test Group:**
- Zinc

**Performing Lab:**
- Quest

**Sendout:**
- Yes

**Methodology:**
- Inductively-Coupled Plasma / Mass Spectrometry

**Patient Preparation:**
- Patient should refrain from taking vitamins or mineral supplements at least 3 days prior to sample collection.

**Collect:**
- Urine cup

**Amount to Collect:**
- 10 mL urine

**Sample Type:**
- Random urine, second voided AM preferred

**Preferred Volume:**
- 7 mL urine

**Minimum Volume:**
- 2 mL urine

**Rejection Criteria:**
- Grossly decomposed urine, hemolysis or fecal contamination. Use of metal based preservative.

**Specimen Preparation:**
- Aliquot 7 mL. Store and transport sample at refrigerated. Order Quest #16502

**Units:**
μg/g Creatinine (mcg/g Creatinine)

Reference Interval:
   2nd voided urine in non-exposed >= 18 year old: 100-810 μg/g creatinine

Synonyms:
   • Zn

Stability (from collection to initiation):
   Room temperature 5 days, refrigerated 2 weeks, frozen at -20C 1 month.

Reported:
   Set up 5x per week. Turn around 5-7 days.

Additional Information:
   Zinc is an essential element involved in a myriad of enzyme systems including wound healing, immune function, and fetal development. Zinc measurements are used to detect and monitor industrial, dietary, and accidental exposure to zinc. Also, Zinc measurements may be used to evaluate health and monitor response to treatment.

CPT Codes:
   82570-90, 84630-90

LOINC Codes:
   13473-4
Zonisamide
ZONI

**ORDERING**

**Available Stat:**
No

**Performing Lab:**
Quest

**Methodology:**
LC/MS/MS

**Reported:**
Run Tuesday and Friday evenings. Turnaround 3-6 days.

**Additional Information:**
Zonisamide is commonly used as an adjunct together with other conventional anticonvulsants. As multiple drugs are administered, it is important to monitor its level to optimize therapeutic effects, to assure compliance, and to avoid toxicity.

**COLLECTION**

**Sample Type:**
Serum

**Collect:**
Gold top or Red top

**Amount to Collect:**
2 mL blood

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
1 mL serum

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 1.5 months

**PROCESSING**

**Test Code:**
ZONI

**Sendout:**
Yes

**Performing Lab:**
Quest

**Specimen Preparation:**
Order Quest test # 37852N

**Preferred Volume:**
1 mL serum

**Minimum Volume:**
1 mL serum

**Stability (from collection to initiation):**
Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 1.5 months

**RESULT INTERPRETATION**

**Units:**
µg/mL (mcg/mL)
Reference Interval:
10-40 µg/mL

Additional Information:
Zonisamide is commonly used as an adjunct together with other conventional anticonvulsants. As multiple drugs are administered, it is important to monitor its level to optimize therapeutic effects, to assure compliance, and to avoid toxicity.

CPT Codes:
80299-90

LOINC Codes:
29620-2

COMPLETE VIEW

Available Stat:
No

Test Code:
ZONI

Performing Lab:
Quest

Sendout:
Yes

Methodology:
LC/MS/MS

Collect:
Gold top or Red top

Amount to Collect:
2 mL blood

Sample Type:
Serum

Preferred Volume:
1 mL serum

Minimum Volume:
1 mL serum

Specimen Preparation:
Order Quest test # 37852N

Units:
µg/mL (mcg/mL)

Reference Interval:
10-40 µg/mL

Stability (from collection to initiation):
Room temperature 1 day, refrigerated 2 weeks, frozen at -20°C 1.5 months

Reported:
Run Tuesday and Friday evenings. Turnaround 3-6 days.

Additional Information:
Zonisamide is commonly used as an adjunct together with other conventional anticonvulsants. As multiple drugs are administered, it is important to monitor its level to optimize therapeutic effects, to assure compliance, and to avoid toxicity.

CPT Codes:
80299-90

LOINC Codes:
29620-2
# ZSFG Comprehensive Drug Screen (High resolution)

**MOLT**

## ORDERING

<table>
<thead>
<tr>
<th>Performing Lab:</th>
<th>ZSFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology:</td>
<td>LC-MS/TOF</td>
</tr>
<tr>
<td>Reported:</td>
<td>1-3 days with prior approval. Monday through Friday only. Not available on weekends or holidays.</td>
</tr>
</tbody>
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### Additional Information:

- This test should only be used in cases where the Quest comprehensive drug screen (Sunquest test code: ABUSU; Drug screen (general toxicology, not available STAT); Quest test code: 91359), is not adequate and/or when the Poison Control Center advise the clinicians to order it. It should not be used routinely.

If clinicians would like to order this test, please follow the procedure below:

1. Look for the oldest urine and/or serum/plasma sample that we have from the patient in question. Keep them refrigerated. If we don't have any samples, request a new urine and serum/plasma sample.

2. Once you find the sample/receive the sample, email the clinician the ZSFG requisition that can be found at the link below and have them complete the top section with the patient information and the contact information. Once they email the requisition form back, complete the bottom part of the form including adding the accession number of each sample and check either one or both of the comprehensive drug screen, high resolution tests.

3. Add a "MOLT" on to the accession numbers of each of the samples that will be sent. In the description, please write “ZSFG drug screen" and add what specimen type it is. For example, if it is a serum sample, write “ZSFG drug screen, serum.”

4. Aliquot samples if necessary - see preferred volume information.

5. Package the samples up in a box and attach the address label at the link below.

6. Call a STAT courier to have the samples picked up and taken to ZSFG.

The results will be called or emailed to the contact information given on the requisition form. The report will be emailed to the sendout department the next day and will be scanned into ApeX (Monday through Friday only, not on holidays or weekends).

[**ZSFG requisition form**](#)

[**ZSFG address label**](#)

### Synonyms:

- comprehensive urine drug screen
- comprehensive serum drug screen
- comprehensive plasma drug screen

## COLLECTION

### Sample Type:

- Random urine and/or serum/plasma

### Collect:

- Preferably added on to the oldest serum or urine sample available from the patient.

- If none available, request fresh specimen. Collect urine in urine cup or serum/plasma in a gold or green gel tube.

### Amount to Collect:

- 2 mL of urine; 1 mL of serum or plasma

### Preferred Volume:

- 2 mL of urine; 1 mL of serum or plasma

### Minimum Volume:
1 mL urine; 0.5 mL of serum or plasma

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen 1 month.

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**PROCESSING**

**Test Code:**
MOLT

**Test Group:**
Drug screening

**Sendout:**
Yes

**Performing Lab:**
ZSFG

**Specimen Preparation:**
Take already collected aliquot of urine or serum/plasma and store refrigerated.

If newly collected sample, aliquot urine and/or serum/plasma and store refrigerated.

**Preferred Volume:**
2 mL of urine; 1 mL of serum or plasma

**Minimum Volume:**
1 mL urine; 0.5 mL of serum or plasma

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen 1 month.

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**RESULT INTERPRETATION**

**Reference Interval:**
No compounds detected

**Additional Information:**
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[ZSFG requisition form](#)
[ZSFG address label](#)

Test information subject to change
**ADMINISTRATIVE**

CPT Codes:
- G0483-90

**COMPLETE VIEW**

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<tr>
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<tr>
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<td>Drug screening</td>
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**Collect:**
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**Amount to Collect:**
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**Sample Type:**
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**Preferred Volume:**
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**Minimum Volume:**
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**Specimen Preparation:**
Take already collected aliquot of urine or serum/plasma and store refrigerated.

If newly collected sample, aliquot urine and/or serum/plasma and store refrigerated.

**Reference Interval:**
No compounds detected

**Synonyms:**
- comprehensive urine drug screen
- comprehensive serum drug screen
- comprehensive plasma drug screen

**Stability (from collection to initiation):**
Refrigerated 1 week, frozen 1 month.

**Reported:**
1-3 days with prior approval. Monday through Friday only. Not available on weekends or holidays.

**Additional Information:**
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comprehensive drug screen, high resolution tests.

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[Links to ZSFG requisition form and ZSFG address label]

**CPT Codes:**

G0483-90