Overview

Useful For
Detection of acute or very recent arsenic exposure
Monitoring the effectiveness of therapy

Special Instructions
- Trace Metals Analysis Specimen Collection and Transport

Method Name
Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)

NY State Available
Yes

Specimen

Specimen Type
Whole blood

Specimen Required
Container/Tube: Royal blue-top (EDTA) Vacutainer plastic trace element blood collection tube (T183)

Specimen Volume: Full tube

Collection Instructions:
1. See Trace Metals Analysis Specimen Collection and Transport in Special Instructions for complete instructions.
2. Send specimen in original collection tube.

Additional Information:
1. High concentrations of gadolinium and iodine are known to interfere with most metals tests. If either gadolinium- or iodine-containing contrast media has been administered, a specimen should not be collected for 96 hours.
2. If ordering the trace element blood collection tube from BD, order catalog #368381.

Specimen Minimum Volume
0.3 mL

Reject Due To

<table>
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<tr>
<th></th>
<th>Mild OK; Gross OK</th>
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<tbody>
<tr>
<td>Hemolysis</td>
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<tr>
<td>Lipemia</td>
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<td>Icterus</td>
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<tr>
<td>Other</td>
<td>Green top (heparin) tube</td>
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**Specimen Stability Information**

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<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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<tr>
<td>Whole blood</td>
<td>Refrigerated (preferred)</td>
<td>28 days</td>
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<tr>
<td></td>
<td>Ambient</td>
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<tr>
<td></td>
<td>Frozen</td>
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**Clinical and Interpretive**

**Clinical Information**

Arsenic (As) exists in a number of toxic and nontoxic forms. The toxic forms are the inorganic species As(+5), also denoted as As(V), the more toxic As(+3), also known as As(III), and their partially detoxified metabolites, monomethylarsine (MMA) and dimethylarsine (DMA). Detoxification occurs in the liver as As(+3) is oxidized to As(+5) and then methylated to MMA and DMA. As a result of these detoxification steps, As(+3) and As(+5) are found in the urine shortly after ingestion, whereas MMA and DMA are the species that predominate more than 24 hours after ingestion.

Blood concentrations of arsenic are elevated for a short time after exposure, after which arsenic rapidly disappears into tissues because of its affinity for tissue proteins. The body treats arsenic like phosphate, incorporating it wherever phosphate would be incorporated. Arsenic "disappears" into the normal body pool of phosphate and is excreted at the same rate as phosphate (excretion half-life of 12 days). The half-life of inorganic arsenic in blood is 4 to 6 hours, and the half-life of the methylated metabolites is 20 to 30 hours. Abnormal blood arsenic concentrations (>12 ng/mL) indicate significant exposure, but will only be detected immediately after exposure. Arsenic is not likely to be detected in blood specimens drawn more than 2 days after exposure because it has become integrated into nonvascular tissues. Consequently, blood is not a good specimen to screen for arsenic, although periodic blood levels can be determined to follow the effectiveness of therapy. Urine is the preferred specimen for assessment of arsenic exposure.

A wide range of signs and symptoms may be seen in acute arsenic poisoning including headache, nausea, vomiting, diarrhea, abdominal pain, hypotension, fever, hemolysis, seizures, and mental status changes. Symptoms of chronic poisoning, also called arseniasis, are mostly insidious and nonspecific. The gastrointestinal tract, skin, and central nervous system are usually involved. Nausea, epigastric pain, colic (abdominal pain), diarrhea, and paresthesias of the hands and feet can occur.

**Reference Values**

0-12 ng/mL

Reference values apply to all ages.

**Interpretation**

Abnormal blood arsenic concentrations (>12 ng/mL) indicate significant exposure.

Absorbed arsenic is rapidly distributed into tissue storage sites with a blood half-life of <6 hours. Unless a blood specimen is drawn within 2 days of exposure, arsenic is not likely to be detected in a blood specimen.

**Cautions**

Measurement of urine arsenic is the preferred method of screening for arsenic exposure. Blood is not a good
specimen to screen for arsenic.

This test is not useful for evaluation of chronic arsenic exposure.

High concentrations of gadolinium and iodine are known to interfere with most metals tests. If either gadolinium- or iodine-containing contrast media has been administered, a specimen must not be collected for 96 hours.

**Clinical Reference**


**Performance**

**Method Description**

Arsenic (As), cadmium (Cd), mercury (Hg), and lead (Pb) are analyzed by ICP-MS in Kinetic Energy Discrimination (KED) mode using helium as a non-reactive gas to collide with polyatomic interferences such as argon chloride (ArCl). Internal standards used are gallium (Ga) for As, rhodium (Rh) for Cd, and lutetium (Lu) and iridium (Ir) summed for Hg and Pb. A salt matrix calibration is used. (Unpublished Mayo method)

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Monday through Saturday; 2 p.m.

**Analytic Time**

1 day

**Maximum Laboratory Time**

3 days

**Specimen Retention Time**

14 days

**Performing Laboratory Location**

Rochester

**Fees and Codes**

**Fees**

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact Customer Service.

**Test Classification**

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

**CPT Code Information**

82175
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