Overview

Useful For
Determining bismuth toxicity

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

Patient Preparation: 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.

Supplies: Metal Free B-D Tube (EDTA), 6 mL (T183)

Collection Container/Tube:
Preferred: Royal blue-top (EDTA) plastic trace element blood collection tube

Specimen Volume: 0.8 mL

Collection Instructions:
1. See Trace Metals Analysis Specimen Collection and Transport in Special Instructions for complete instructions.
2. Send specimen in original tube. Do not aliquot.

Reject Due To

Gross hemolysis  OK
Gross lipemia  OK
Gross icterus  OK

Specimen Minimum Volume
0.25 mL

Specimen Stability Information

<table>
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<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
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<tbody>
<tr>
<td>Whole blood</td>
<td>Refrigerated (preferred)</td>
<td>28 days</td>
<td></td>
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<tr>
<td></td>
<td>Ambient</td>
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Clinical & Interpretive

Clinical Information
Bismuth is used in the production of alloys, pigments, and chemical additives. Various compounds have also been used as therapeutic agents, astringents, antacids. Bismuth subsalicylate (Pepto-Bismol) is one example commonly used for indigestion and diarrhea.

In unexposed individuals, bismuth blood concentrations were typically less than 0.02 mcg/L compared to peptic ulcer patients taking bismuth medications where the concentrations ranged from 4 to 30 mcg/L. Elimination from the body takes place primarily by the urinary and fecal routes, but the exact proportion contributed by each route is still unknown. Elimination from blood displays multicompartment pharmacokinetics with half-lives of 8 to 16 hours (early) and 5 to 11 days (late).

A number of toxic effects have been attributed to bismuth compounds in humans including: nephropathy, encephalopathy, osteoarthropathy, gingivitis, stomatitis, and colitis. Common early symptoms include salivation, mucosal swelling, discoloration of the tongue, gums, abdominal pain, and nausea.

Reference Values
- <1 ng/mL (unexposed)
- 4-30 ng/mL (therapeutic)

Interpretation
Normal blood concentrations for unexposed individuals are less than 1 ng/mL and the therapeutic range is 4 to 30 ng/mL.

Cautions
No significant cautionary statements.

Clinical Reference
5. Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 6th ed. Elsevier; 2018

Performance
Bismuth (Bi) in whole blood is analyzed by inductively coupled plasma-mass spectrometry ICP-MS in standard mode using thallium (Tl) as an internal standard and using a salt matrix calibration. (Unpublished Mayo method)

**Method Description**

**PDF Report**
No

**Specimen Retention Time**
14 days

**Performing Laboratory Location**
Rochester

**Fees & Codes**

**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 US Food and Drug Administration.

**CPT Code Information**
83018

**LOINC® Information**

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