MAYO CLINIC LABORATORIES

Test Definition: ASB

Arsenic, Blood

Overview

Useful For

Detecting acute or very recent arsenic exposure

Monitoring the effectiveness of therapy

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

Special Instructions

- Metals Analysis Specimen Collection and Transport

Method Name

Triple Quadrupole Inductively Coupled Plasma Mass Spectrometry (ICP-MS/MS)

NY State Available

Yes

Specimen

Specimen Type

Whole blood

Ordering Guidance

The preferred method of screening for arsenic exposure is measurement of urinary arsenic concentration. Order either SPASU / Arsenic Speciation, 24 Hour, Urine or SPAS / Arsenic Speciation, Random, Urine.

Specimen Required

This specimen container cannot be opened or used for any other testing before shipping.

Patient Preparation: High concentrations of gadolinium and iodine are known to potentially interfere with most inductively coupled plasma mass spectrometry-based metal tests. If either gadolinium- or iodine-containing contrast media has been administered, a specimen **should not be collected for 96 hours**.

Supplies:

-Metal Free EDTA 3 mL Tube (T989)

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

Container/Tube:

Preferred: Royal blue-top BD vacutainer with EDTA blood collection tube (3 mL) (BD catalog no. 367777) (T989)

Acceptable: Royal blue-top BD Vacutainer Plus with EDTA blood collection tube (6 mL) (BD catalog no. 368381) (T183)

Specimen Volume: 1 mL

Collection Instructions:

1. See Metals Analysis Specimen Collection and Transport for complete instructions.

2. Send whole blood specimen in original collection tube. **Do not aliquot.**

Specimen Minimum Volume

0.25 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Whole blood	Refrigerated (preferred)	28 days	
	Ambient	28 days	
	Frozen	28 days	

Clinical & 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, monomethylarsonic acid (MMA) and dimethylarsinic acid (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
<13 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 less than 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
No significant cautionary statements

Clinical Reference
1. Hall M, Chen Y, Ahsan H, et al. Blood arsenic as a biomarker of arsenic exposure: results from a prospective study. Toxicology. 2006;225(2-3):225-233
2. Strathmann FG, Blum LM. Toxic elements. In: Rifai N, Chiu RWK, Young I, Burnham CD, Wittwer CT, eds. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier; 2023:chap 44

Performance

Method Description
The metal of interest is analyzed by triple quadrupole inductively coupled plasma mass spectrometry.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Saturday

Report Available
1 to 3 days

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

Fees & 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 account representative. 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. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

82175

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
ASB	Arsenic, B	5583-0

Result ID	Test Result Name	Result LOINC® Value
32190	Arsenic, B	5583-0