

Overview

Useful For

Determining molybdenum toxicity

Special Instructions

- [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 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 B-D Tube (EDTA), 6 mL (T183)

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

Specimen Volume: 0.8 mL

Collection Instructions:

1. See [Metals Analysis Specimen Collection and Transport](#) for complete instructions.
2. Send whole blood specimen in original 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

Molybdenum is an essential trace element and a component of metalloflavoproteins. High concentrations are found in leafy vegetables and legumes. The recommended daily dietary allowance for molybdenum is 45 mcg for adults.(1)

As an industrial metal, molybdenum is used in the manufacturing of steel alloys, lubricants, or pigments. Occupational exposure is generally from inhalation of dusts or fumes. The current threshold limit is 0.5 mg/m(2) for soluble compounds and 3 mg/m(2) (respirable fraction) for the metal and its insoluble compounds.(1)

Oral absorption varies from 28% to 77%. Whole blood concentrations averaged 0.43 mcg/L (range 0.6-4.0 mcg/L) in unexposed individuals.(2) However, exposed adults averaged 2.7 mcg/L (range 1.2-4.8 mcg/L).(3) Once absorbed, molybdenum is primarily eliminated in the urine over 5 or more days.(4)

Molybdenum deficiency can cause irritability, altered levels of consciousness, and a variety of biochemical abnormalities.(5) Toxicity can range from auditory and visual hallucinations, diarrhea, insomnia, painful extremities, and seizures.(6)

Whole blood molybdenum concentrations are likely to be increased above the reference range in patients with metallic joint prosthesis.

Reference Values

<4 ng/mL (unexposed)

<5 ng/mL (exposed)

Interpretation

Normal blood concentrations are 0.6-4.0 ng/mL in unexposed individuals and 1.2-4.8 ng/mL in exposed individuals.(4)

Cautions

To avoid contamination during specimen collection, it is essential to follow collection procedures as outlined in [Metals Analysis Specimen Collection and Transport](#).

Clinical Reference

- Baselt R. Disposition of Toxic Drugs and Chemicals In: Man. 10th ed. Biomedical Publications; 2014
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- Burguera JL, Burguera M. Molybdenum in human whole blood of adult residents of the Merida State (Venezuela). J Trace Elem Med Biol. 2007;21(3):178-183
- Werner E, Roth P, Heinrichs U, et al. Internal biokinetic behaviour of molybdenum in humans studied with stable

isotopes as tracers. *Isotopes Environ Health Stud.* 2000;36(2):123-132

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6. Momcilovic B. A case report of acute human molybdenum toxicity from a dietary molybdenum supplement--a new member of the "Lucor metallicum" family. *Arh Hig Rada Toksikol.* 1999;50(3):289-297

7. Gebel T, Claussen K, Dunkelberg H. Human biomonitoring of antimony. *Int Arch Occup Environ Health.* 1998;71(3):221-224

8. Sodi R. Vitamins and trace elements. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT, eds. *Tietz Textbook of Laboratory Medicine.* 7th ed. Elsevier; 2023:417-417

9. Witzleb WC, Ziegler J, Krummenauer F, Neumeister V, Guenther KP. Exposure to chromium, cobalt and molybdenum from metal-on-metal total hip replacement and hip resurfacing arthroplasty. *Acta Orthop.* 2006;77(5):697-705

Performance

Method Description

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

PDF Report

No

Day(s) Performed

Wednesday

Report Available

1 to 8 days

Specimen Retention Time

14 days

Performing Laboratory Location

Rochester

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

83018

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MOWB	Molybdenum, B	5696-0

Result ID	Test Result Name	Result LOINC® Value
64272	Molybdenum, B	5696-0