MAYO CLINIC LABORATORIES

Test Definition: MOWB

Molybdenum, B

Overview

Useful For
Determining molybdenum toxicity

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	Reject

Specimen Minimum Volume
0.25 mL

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)

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 Trace Metals Analysis Specimen Collection and Transport in Special Instructions.

Clinical Reference

1. Baselt R: Disposition of Toxic Drugs and Chemicals In Man. 10th ed., Biomedical Publications; 2014
2. Heitland P, Koster HD: Biomonitoring of 37 trace elements in blood samples from inhabitants of northern Germany by ICP-MS. J Trace Elem Med Biol. 2006;20(4):253-262
3. 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
4. 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
5. Abumrad NN, Schneider AJ, Steel D, Rogers LS: Amino acid intolerance during prolonged total parenteral nutrition reversed by molybdate therapy. Am J Clin Nutr. 1981;34(11):2551-2559
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. Rifai N, Horvath AR, Witttwer CT, eds.Tietz Textbook of Clinical Chemistry and Molecular Diagnostics 6th ed. Elsevier; 2018

Performance

Test Definition: MOWB

Molybdenum, B

Method Description

Molybdenum (Mo) in whole blood is analyzed by ICP-MS in standard mode using rhodium (Rh) as an internal standard and using a salt matrix calibration.(Unpublished Mayo method)

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