

Overview

Useful For

Detection of nonacute arsenic exposure

Special Instructions

- [Collecting Hair and Nails for Metals Testing](#)

Method Name

InductivelyCoupledPlasma-MassSpectrometry(ICP-MS)

NY State Available

No

Specimen

Specimen Type

Nail

Specimen Required

Supplies: Hair and Nails Collection Kit (T565)

Specimen Volume: 0.2 g

Collection Instructions:

1. Prepare and transport specimen per the instructions in the kit or see [Collecting Hair and Nails for Metals Testing](#) in Special Instructions.
2. Clippings should be taken from all 10 fingernails or toenails.

Additional Information: If known, indicate source of nails (fingernails or toenails).

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Minimum Volume

0.05 g

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Nail	Ambient (preferred)		
	Frozen		
	Refrigerated		

Clinical & Interpretive

Clinical Information

Arsenic circulating in the blood will bind to protein by formation of a covalent complex with sulfhydryl groups of the amino acid cysteine. Keratin, the major structural protein in hair and nails, contains many cysteine residues and, therefore, is one of the major sites for accumulation of arsenic. Since arsenic has a high affinity for keratin, the concentration of arsenic in nails is higher than in other tissues.

Several weeks after exposure, transverse white striae, called Mees' lines, may appear in the fingernails.

Reference Values

0-15 years: not established

> or =16 years: <1.0 mcg/g of nails

Interpretation

Nails grow at a rate of approximately 0.1 inch/month. Nail keratin synthesized today will grow to the distal end in approximately 6 months. Thus, a nail specimen collected at the distal end represents exposure of 6 months ago.

Nail arsenic above 1.0 mcg/g dry weight may indicate excessive exposure. It is normal for some arsenic to be present in nails, as everybody is exposed to trace amounts of arsenic from the normal diet.

The highest hair or nail arsenic observed at Mayo Clinic was 210 mcg/g dry weight in a case of chronic exposure that was the cause of death.

Clinical Reference

Hindmarsh JT, McCurdy RF: Clinical and environmental aspects of arsenic toxicity. Crit Rev Clin Lab Sci 1986;23:315-347

Performance**Method Description**

Arsenic in nail specimens is analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) in kinetic energy discrimination (KED) mode using gallium, iridium, and lutetium as internal standards, and 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

82175