Overview

Useful For
Detection of nonacute arsenic exposure in hair specimens

Special Instructions
- Collecting Hair and Nails for Metals Testing

Method Name
Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)

NY State Available
No

Specimen

Specimen Type
Hair

Specimen Required

Supplies: Hair and Nails Collection Kit (T565)

Specimen Volume: 0.2 g

Collection Instructions: Prepare and transport specimen per the instructions in the kit or see Collecting Hair and Nails for Metals Testing in Special Instructions.

Additional Information: If known, indicate source of hair (axillary, head, or pubic).

Specimen Minimum Volume
0.05 g

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

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair</td>
<td>Ambient (preferred)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Refrigerated</td>
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Clinical and Interpretive
Clinical Information
Arsenic circulating in the blood will bind to protein by formation of a covalent complex with sulphydryl 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 hair is higher than in other tissues.

Arsenic binds to keratin at the time of exposure, “trapping” the arsenic in hair. Therefore, hair analysis for arsenic is not only used to document that an exposure occurred, but when it occurred. Hair collected from the nape of the neck can be used to document recent exposure. Axillary or pubic hair is used to document long-term (6 months-1 year) exposure.

Reference Values
0-15 years: not established
> or =16 years: <1.0 mcg/g of hair

Interpretation
Hair grows at a rate of approximately 0.5 inch/month. Hair keratin synthesized today will protrude through the skin in approximately 1 week. Thus, a hair specimen collected at the skin level represents exposure of 1 week ago, 1 inch distally from the skin represents exposure 2 months ago, etc.

Hair arsenic levels above 1.00 mcg/g dry weight may indicate excessive exposure. It is normal for some arsenic to be present in hair, as everybody is exposed to trace amounts of arsenic from the normal diet.

The highest hair 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


Performance
Method Description
Arsenic, mercury, and lead in hair are 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

Day(s) and Time(s) Test Performed
Tuesday; 3 p.m.

Analytic Time
2 days
Maximum Laboratory Time
7 days

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees and 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 Regional Manager. 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. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
82175

LOINC® Information

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<td>ASHA</td>
<td>Arsenic, Hair</td>
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<table>
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<th>Result LOINC Value</th>
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<tbody>
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<td>31896</td>
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<td>5584-8</td>
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<td>ASHSC</td>
<td>Specimen Source</td>
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