Overview

Useful For
Investigation of patients with possible Wilson disease

Testing Algorithm
See Wilson Disease Testing Algorithm in Special Instructions.

Special Instructions
- Wilson Disease Testing Algorithm

Method Name
Nephelometric Assay

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required

Patient Preparation: Patient should be fasting: 4 hours preferred, nonfasting acceptable.

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Forms
If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:
- Benign Hematology Test Request (T755).
- General Request (T239)
- Gastroenterology and Hepatology Client Test Request (T728)

Specimen Minimum Volume
0.5 mL

Reject Due To
<table>
<thead>
<tr>
<th>Gross hemolysis</th>
<th>Reject</th>
</tr>
</thead>
</table>

Document generated August 25, 2020 at 10:12pm CDT
**Clinical and Interpretive**

**Clinical Information**

Ceruloplasmin is a positive acute-phase reactant and a copper-binding protein that accounts for over 95% of serum copper in normal adults. Ceruloplasmin is measured primarily to assist with a diagnosis of Wilson disease. Other indications include Menkes disease, dietary copper insufficiency, and risk of cardiovascular disease.

Wilson disease is a rare inherited disorder of copper transport that results in low serum copper and ceruloplasmin and accumulation of copper in various tissues. The pathological accumulation of copper in the liver, brain, cornea, and kidney causes cirrhosis, neuropsychiatric symptoms, Kayser-Fleischer rings, and hematuria/proteinuria, respectively. See [Wilson Disease Testing Algorithm](#) in Special Instructions for appropriate use of clinical findings, serum biomarkers, genetic tests, and tissue biopsies when working up suspected cases.

Menkes disease is an X-linked disorder in which dietary copper is absorbed from the gastrointestinal tract but cannot be transported, so copper is not available to the liver for incorporation into ceruloplasmin.

Dietary ceruloplasmin deficiency may be due to inadequate dietary copper intake, long-term parenteral nutrition without copper supplementation, malabsorption, penicillamine therapy, or a combination of these.

**Reference Values**

**Males:**

- 0-8 weeks: 7.4-23.7 mg/dL
- 9 weeks-5 months: 13.5-32.9 mg/dL
- 6-11 months: 13.7-38.9 mg/dL
- 12 months-7 years: 21.7-43.3 mg/dL
- 8-13 years: 20.5-40.2 mg/dL
- 14-17 years: 17.0-34.8 mg/dL
- > or =18 years: 19.0-31.0 mg/dL

**Females:**

---

**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>Serum</td>
<td>Refrigerated (preferred)</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>30 days</td>
<td></td>
</tr>
</tbody>
</table>
Test Definition: CERS

Ceruloplasmin, S

0-8 weeks: 7.4-23.7 mg/dL
9 weeks-5 months: 13.5-32.9 mg/dL
6-11 months: 13.7-38.9 mg/dL
12 months-7 years: 21.7-43.3 mg/dL
8-13 years: 20.5-40.2 mg/dL
14-17 years: 20.8-43.2 mg/dL
> or = 18 years: 20.0-51.0 mg/dL

Interpretation

Low concentrations of ceruloplasmin are consistent with Wilson disease and warrant further investigation.

Values vary considerably from patient to patient and may be in the normal range in some patients with Wilson disease (indicating a different primary defect).

Ceruloplasmin is a positive acute-phase reactant. Increases in serum ceruloplasmin have been reported during pregnancy, in women taking oral contraceptives, in hepatitis, pneumonia, tuberculosis, rheumatoid arthritis, myocardial infarction, various forms of anemia, and many obscure neurological disorders.

Cautions

Ceruloplasmin is a positive acute-phase reactant; therefore, levels are elevated in cases of inflammation (as in chronic hepatitis or active infection). Consequently, ceruloplasmin levels are not always extremely low in patients with Wilson disease.

Birth control pills and pregnancy increase ceruloplasmin levels.

Clinical Reference


Performance

Method Description

Human ceruloplasmin forms a precipitate with a specific antiserum which is then measured nephelometrically. (Package insert: Ceruloplasmin, Siemens, Newark, DE 08/2018)
Test Classification

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer’s instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

82390

LOINC® Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERS</td>
<td>Ceruloplasmin, S</td>
<td>2064-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CERS</td>
<td>Ceruloplasmin, S</td>
<td>2064-4</td>
</tr>
</tbody>
</table>