Lab Dept: Chemistry

Test Name: COPPER, SERUM

General Information

Lab Order Codes: COPP

Synonyms: Cu, blood

CPT Codes: 82525 - Copper

Test Includes: Copper level reported in mcg/mL.

Logistics

Test Indications: Useful for diagnosis of Wilson’s disease, primary biliary cirrhosis (PBC) and primary sclerosing cholangitis (PSC).

In normal serum, more than 95% of the copper is incorporated into the enzyme, ceruloplasmin; the remaining copper is loosely bound to albumin. A deficiency in copper results in severe derangement in growth and metabolism and impairment of erythropoiesis.

Lab Testing Sections: Chemistry - Sendouts

Referred to: Mayo Medical Laboratories (MML Test: CUS)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Daily, 24 hours

Turnaround Time: 1 - 3 days; performed Monday-Saturday

Special Instructions: See Container and Collection and Patient Preparation for special requirements.

Specimen

Specimen Type: Blood

Container: Dark Blue top with Red Stripe [Metal Free Navy (No additive) tube] – available from the laboratory

Draw Volume: 2.4 mL (Minimum: 1.5 mL) blood
**Processed Volume:** 0.8 mL (Minimum: 0.2 mL) serum

Note: Submission of the minimum volume does not allow repeat analysis.

**Collection:** Use stainless steel needle or butterfly vacutainer collection. Collect in a royal blue top tube (See Container). Avoid hemolysis.

**Special Processing:** Lab Staff: Blood specimens for serum testing should be collected in the dark blue-top with red stripe, Trace Element Blood Collection Tube.

1. Allow the specimen to clot for 30 minutes; then centrifuge the specimen to separate serum from the cellular fraction within 4 hours of specimen collection.

2. Remove the stopper and carefully pour serum aliquot into a 7 mL, Mayo metal free, screw-capped, polypropylene vial (Mayo Supply T173), avoiding transfer of the cellular components of blood. Do Not insert a pipet into the serum to accomplish transfer, and Do Not ream the specimen with a wooden stick to assist with serum transfer.

3. Place the cap on the polypropylene vial tightly, attach a specimen label and send specimen to the laboratory refrigerated.

**Patient Preparation:** Gadolinium is known to interfere with most metal tests. If gadolinium-containing contrast media has been administered, a specimen cannot be collected for 48 hours

**Sample Rejection:** Specimens other than serum; mislabeled or unlabeled specimens

**Interpretive**

<table>
<thead>
<tr>
<th>Age:</th>
<th>Reference Range (mcg/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 mos.</td>
<td>0.40 – 1.40 mcg/mL</td>
</tr>
<tr>
<td>3 – 6 mos.</td>
<td>0.40 – 1.60 mcg/mL</td>
</tr>
<tr>
<td>7 – 9 mos.</td>
<td>0.40 – 1.70 mcg/mL</td>
</tr>
<tr>
<td>10 – 12 mos.</td>
<td>0.80 – 1.70 mcg/mL</td>
</tr>
<tr>
<td>13 mos. – 10 yrs.</td>
<td>0.80 – 1.80 mcg/mL</td>
</tr>
<tr>
<td>≥11 yrs.</td>
<td>0.75 – 1.45 mcg/mL</td>
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</tbody>
</table>

**Critical Values:** N/A
Limitations:  
Gadolinium is known to interfere with most metal tests. If gadolinium-containing contrast media has been administered, a specimen cannot be collected for 96 hours.

Methodology:  
Dynamic Reaction Cell (DRC) II Inductively Coupled Plasma Mass Spectrophotometry (DRC-ICP-MS)

References:  
Mayo Medical Laboratories Web Page December 2017

Updates:  
11/11/2008: Reference range previously reported as 0.75 - 1.45 µg/mL for all ages. New reference ranges have now been established for pediatrics.
4/6/2010: Method change; previously listed as Inductively Coupled Plasma (ICP) Emission Spectroscopy
9/9/2014: Clarification of tube type.
11/23/2016: Updated minimum volume due to short samples.
2/14/2017: Tube update.