Ceruloplasmin (Blood)

Does this test have other names?

CP

What is this test?

This test is used to measure how much of a copper-containing protein is in your blood. This test is used to diagnose problems related to copper, such as Wilson disease. Wilson disease is a rare inherited disease. It causes too much copper in your blood.

Ceruloplasmin is a protein made in your liver. It stores and carries the mineral copper around your body. Ceruloplasmin carries 65% to 90% of the copper found in blood. Copper is vital to many processes in your body. These include building strong bones and making melanin. But having too much copper in your body can be toxic.

Your liver normally takes copper from your bloodstream and puts it into ceruloplasmin proteins. The ceruloplasmin is then released into blood plasma. Ceruloplasmin carries copper around your body to the tissues that need it.

In Wilson disease, copper is not put in ceruloplasmin. The disease also keeps your liver from sending extra copper to be eliminated in your bowel movements. Instead, copper builds up in your liver until it overflows into the bloodstream. From there, copper builds up in your brain, corneas, kidneys, liver, bones, and small glands near the thyroid. If not treated, the liver and brain damage due to copper poisoning from Wilson disease is fatal.

If you have Wilson disease, you shouldn't eat foods high in copper. These include liver, shellfish, mushrooms, nuts, or chocolate. You should also not take dietary supplements that have copper. You may also want to have your drinking water tested for copper levels.

Why do I need this test?

You may need this test if you have a family history of Wilson disease. You have to inherit an abnormal gene from both parents to have the disease. So it's possible to have this condition even without a known family history. Symptoms usually begin between ages 5 and 40. But they can appear earlier or later in life.

You may also have this test if you have nerve problems and liver-related problems that look a lot like symptoms of hepatitis.

For example, copper toxicity in the central nervous system from Wilson disease can cause:

- Trouble speaking or swallowing
- Tremors
- Lack of coordination
- Stiff muscles
- Changes in behavior

Copper toxicity in the liver from Wilson disease can cause:

- Swollen liver or spleen
- Yellowing of the skin and eyes (jaundice)
- Buildup of fluid in the legs and belly

- Extreme tiredness
- Lots of bruising

Other symptoms of Wilson disease include:

- Anemia
- Low platelet or white blood cell count
- Slow blood clotting
- High amounts of amino acids, protein, uric acid, and carbohydrates in the urine
- Osteoporosis and arthritis

You may also have Kayser-Fleischer rings. These are brown rings within the corneas in your eyes. These rings are seen only through an eye exam and are a clear sign of Wilson disease. The rings happen in 95% of people with Wilson disease who have nerve symptoms. They happen in about 65% of people with liver symptoms.

What other tests might I have along with this test?

You may also have tests for copper levels in your blood, urine, or liver tissue.

Your healthcare provider may also look for:

- Kayser-Fleischer rings within your corneas
- Low copper in your blood serum
- A high level of copper in a 24-hour urine sample. This means more than 40 micrograms (mcg) per day.
- Higher levels of amino acids in your urine
- Hemolytic anemia, or low red cell count

Your healthcare provider may also order:

- Liver function tests. This includes a liver biopsy to look for damage, disease, and copper amounts.
- Genetic testing
- MRI scan. You may need this if you have nerve problems or behavior changes.
- CT scan

What do my test results mean?

Test results may vary depending on your age, gender, health history, and other things. Your test results may be different depending on the lab used. They may not mean you have a problem. Ask your healthcare provider what your test results mean for you.

The normal range for a ceruloplasmin serum test in an adult is 20 to 35 milligrams per deciliter (mg/dL). If you have Wilson disease, your ceruloplasmin level will probably be below 10 mg/dL.

Low ceruloplasmin might also mean Menkes disease. This is a genetic disorder that makes it hard for your body to absorb copper. Low ceruloplasmin might also mean you have:

- Nephrotic syndrome, or kidney problems
- Advanced liver disease

- Problem with absorbing nutrients

Your ceruloplasmin level can be higher than normal because of pregnancy, estrogen therapy, and birth control pills. Diseases such as leukemia, Hodgkin lymphoma, primary biliary cirrhosis, and rheumatoid arthritis can also cause a higher ceruloplasmin level.

If you have Wilson disease, the copper level in your blood is usually lower than normal. But it can be higher than normal if you also have acute liver failure. Your ceruloplasmin levels can also be normal even with Wilson disease if you also have acute hepatitis.

How is this test done?

The test is done with a blood sample. A needle is used to draw blood from a vein in your arm or hand.

Does this test pose any risks?

Having a blood test with a needle carries some risks. These include bleeding, infection, bruising, and feeling lightheaded. When the needle pricks your arm or hand, you may feel a slight sting or pain. Afterward, the site may be sore.

What might affect my test results?

Pregnancy, estrogen therapy, and birth control pills can raise ceruloplasmin levels. Inflammation from infection, injury, or trauma can also cause an increase.

How do I get ready for this test?

You don't need to prepare for this test. Be sure your healthcare provider knows about all medicines, herbs, vitamins, and supplements you are taking. This includes medicines that don't need a prescription and any illegal drugs you may use.