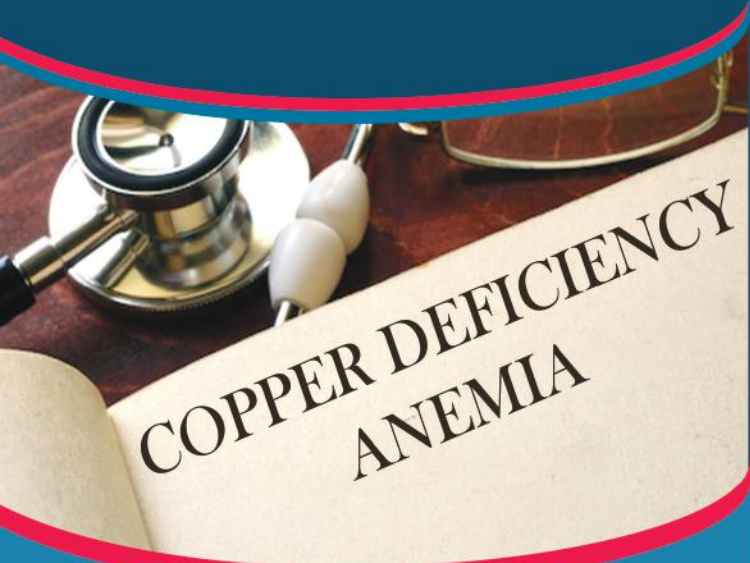




# Copper Deficiency Anemia



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## ▶ Copper deficiency causes ◀

Acquired copper deficiency is commonly caused by a combination of nutrient deficiencies and impairment of gastrointestinal function (that can be caused by disease or surgery). Inherited copper deficiency is a genetic disorder.

### ▶ Dietary causes:

Acquired and inherited copper deficiencies are rare; because of the little copper requirement of the body. Most people are able to meet their daily needs through a typical diet. However, copper deficiency occurs in the following situations:

- ▶ **Protein deficiency during childhood:** Infants who fed only with cow's milk formula may not receive adequate copper.
- ▶ **Excess Zinc:** Zinc impairs the absorption of the copper. Daily zinc intake greater than 50 mg/day for an extended period of time can result in copper deficiency.
- ▶ **Persistent infant diarrhea:** Infants with persistent diarrhea may not absorb adequate essential nutrients.

### ▶ Total parenteral nutrition (TPN):

Some people with severe illness are unable to eat orally and can not absorb nutrients through the gut. Instead, they are fed through intravenous formulas. However, sometimes the TPN formula does not contain adequate copper, so people can become copper deficient if they are dependent on the formula for an extended period of time.

## ▶ Suggested copper intake ◀

For people with normal absorption, the Institute of Medicine recommends the following daily amounts:

- 5 **Children (1 to 3 years):** 340 mcg/day



**Children (4 to 8 years):** 440 mcg/day

**Children (9 to 13 years):** 700 mcg/day

**Adolescents (14 to 18 years):** 890 mcg/day

**Adults (19 and older):** 900 mcg/day

**Pregnant females:** 1,000 mcg/day

**Lactating females:** 1,300 mcg/day

## ▶ Recommended foods for copper deficiency ◀

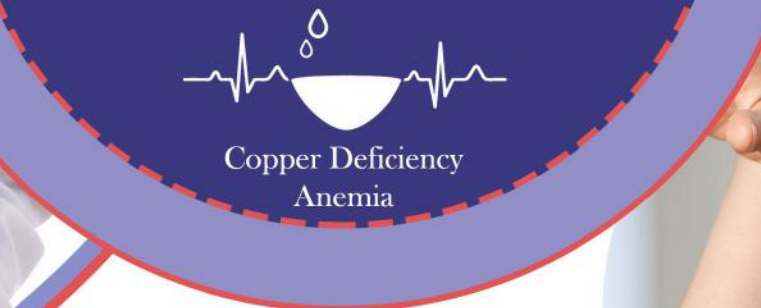
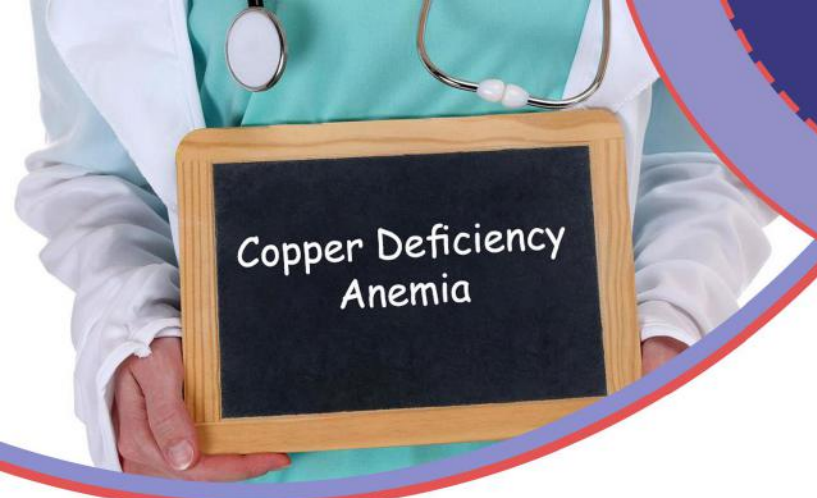
Copper is present in a variety of foods. Dietary requirements for copper and other essential vitamins and minerals can be obtained by eating a variety of healthy foods. Foods rich in copper include: Oysters, crabs and shellfish , Whole grains, Beans , Nuts , Kidney and liver ,Dark leafy greens , Chocolate.

## ▶ Copper supplements ◀

Copper sulfate: Oral form of copper supplement.

Copper histidine: Intravenous form of the copper supplement; which is prescribed for patients who are fed by TPN.





▶ **Copper deficiency anemia** ◀

Copper is a natural element; which is necessary for many of the body's functions. Although small amount of copper presents in the body, copper is crucial for proper functioning of the nervous, musculoskeletal and immune systems, as well as the production of red blood cells. Deficient or insufficient amount of copper can be caused by a poor diet, malabsorption or an inherited disorder.

Acquired copper deficiency can usually be remedied by supplements and a proper diet. However, the effects of inherited copper deficiency are often permanent.

▶ **Copper deficiency symptoms** ◀

Symptoms and the effects of copper deficiency on body systems are variable, depending on whether the copper deficiency is acquired or inherited.

Acquired copper deficiency in adults results in:

▶ **Hematologic and immune-related symptoms**

Copper is an essential factor in the accurate functioning of the iron (an essential parameter for red blood cell production); therefore, hematologic symptoms occur in copper deficiency.



Hematologic symptoms include:

▶ **Anemia:** Low red blood cell counts result in fatigue and paleness that do not improve with iron supplementation.

▶ **Frequent infections:** This is due to low white blood cell counts (neutropenia).

▶ **Neurologic and sensory-related symptoms**

Copper plays an important role in the production and preservation of the myelin, a sheath that coats nerves and facilitates the communication of signals throughout the nervous system. A copper-containing enzyme also converts dopamine to norepinephrine (two types of neurotransmitters). Copper deficiency may result in:

- ▶ Peripheral neuropathy
- ▶ Myelopathy
- ▶ Improper synthesis of neurotransmitters