Selenosis

Signs, Symptoms and Causes of Toxic Selenium Exposure

INTERNATIONAL JOINT COMMISSION
HEALTH PROFESSIONALS ADVISORY BOARD

PRACTITIONERS' GUIDE

Selenium is an important nutrient

Selenium is nutritionally essential in humans and is most commonly consumed in a diet including foods like meat, seafood, grains, nuts and cereals. The recommended dietary allowance (RDA) of selenium is 55 micrograms (mcg) for adults and 15 to 40 mcg for children based on age. The amount of selenium in food ranges from none in iceberg lettuce to 544 mcg per 1 ounce serving (6 to 8 nuts) of Brazil nuts, the densest food source of selenium. Selenium is available in multivitamin supplements and as a standalone supplement.

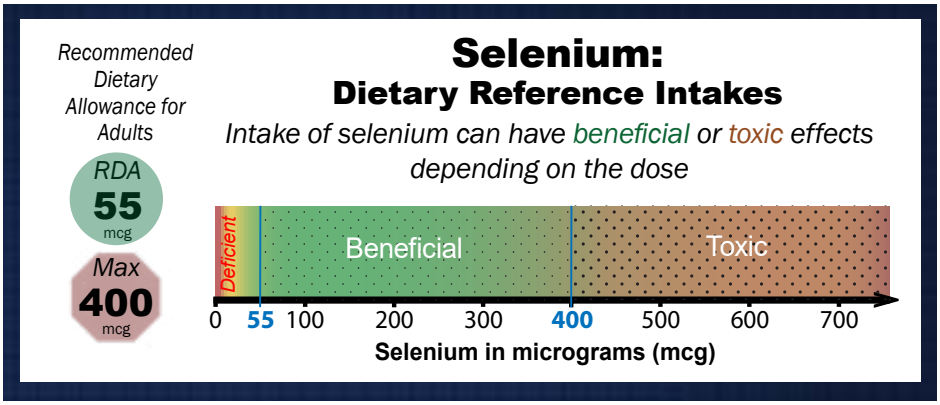
Selenium poisoning can be more common than expected

There is a narrow margin between the recommended daily allowance of selenium for adults of 55 mcg and the tolerable upper intake level, which is a maximum daily intake of 400 mcg. When selenium intake is regularly greater than 400 mcg, health problems may occur.

What are the risk factors?

Consuming selenium above the maximum daily intake level can occur from the use of high-dose multi-vitamins with mineral supplements or from environmental exposure. Typical diets provide sufficient selenium to meet the daily recommended allowance of 55 mcg for adults. Chronic overconsumption of selenium may lead to toxic overexposure.

Elevated selenium is present in the fish populations of some aquatic ecosystems including Lake Superior in the Great Lakes, the Red River in Manitoba and North Dakota, and the Rainy River in Ontario and Minnesota. Regular consumption of fish from areas with elevated selenium could negatively impact human health.



Where does Selenium come from?

The amount of selenium absorbed from food depends on the level of selenium available in the surrounding environment of the source of the food. Selenium occurs naturally and can be introduced to soil or water as a byproduct of its commercial and industrial uses, including coal mining and metal mining and processing.

Impacts of Selenium Overexposure

Selenosis is the condition resulting from chronic selenium intoxication. Selenosis symptoms include fatigue and hair and nail damage or loss. Neurotoxic effects can include lethargy, dizziness, motor weakness and burning or prickling in the extremities. There is some evidence for chronic impacts at lower doses including heart disease.

Addressing Toxic Selenosis

Selenosis can have a number of causes. Find out if your region has an elevated risk for selenium in fish populations or food products due to high concentrations of selenium in the water or soil. Test patients accordingly if suspected of high selenium consumption. Selenosis symptoms are temporary if the patient is removed from exposure. Most symptoms resolve within about four weeks. ■

Human Health Impact

Selenosis Case Studies

Selenium Supplements

A 2008 recall of a dietary supplement containing 40,800 mcg of selenium affected users who reported symptoms such as: diarrhea, fatigue, hair and nail loss and joint pain.

Chronic Exposure in China

In the 1960s, villages in Enshi, China increased local consumption of corn grown in high-selenium soils. Daily overexposure up to 38,000 mcg caused hair and nail deformity and loss.

Risk of Cancer & Disease

Current evidence is inconclusive whether selenium reduces the risk of cancer, heart disease and diabetes. Research linking selenium to increased risk for some cancers, such as prostate cancer, is also inconclusive.

