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Memorial Sloan Kettering
Cancer Center

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[History](#)

[Equality, diversity & inclusion](#)

[Annual report](#)

[Give to MSK](#)

There is no clear evidence to support the use of selenium for cancer prevention.

Selenium is an element obtained in the diet from seafood, poultry, meats, cereals, nuts, and grains. It is an essential part of cellular antioxidant systems that protects cells from DNA damage and mutations. For this reason, it has been studied for prevention of diseases caused or aggravated by this type of damage including cancer, heart disease, and diabetes. Selenium is also necessary for proper immune function, but it is not known whether higher-than-normal levels of selenium can stimulate the immune system.

Long-term use of selenium may increase the risk of certain types of cancer, and large doses can cause serious side effects.

What are the potential uses and benefits?

- To prevent or treat cancer
Clear evidence is lacking. Some studies suggest it may actually increase the risk of aggressive and secondary cancers.
- To reduce cancer treatment side effects
Preliminary studies suggest it may reduce some side effects caused by cancer treatments, but additional studies are needed.
- To prevent heart disease
Although low blood selenium levels have been associated with heart disease, studies do not support the use of selenium to protect against heart disease.
- To prevent diabetes
Supplementation is not useful in preventing diabetes and in some cases may increase the risk for this disease.
- To stimulate the immune system

A few studies suggest enhanced immune response, but more studies are needed.

What are the side effects?

With doses >1000 micrograms per day: Muscle weakness, fatigue, nerve pain, skin irritation, nail and hair changes/loss, garlic breath/body odor, irritability, and liver damage.

Accidental overdose: Gram quantities of selenium can cause severe GI and nerve problems, breathing distress, kidney or heart problems, and in one reported case led to death.

What else do I need to know?

Special Point:

- Daily recommended intake: 55 micrograms, which is usually provided by seafood, meat, and fortified grain products.
- Tolerable upper level of selenium: 400 micrograms per day. Higher dosages can cause toxicity.
- Supplementation in patients with low levels or during active treatment should be under the guidance of healthcare practitioners.

If you have questions or concerns, contact your healthcare provider. A member of your care team will answer Monday through Friday from 9 a.m. to 5 p.m. Outside those hours, you can leave a message or talk with another MSK provider. There is always a doctor or nurse on call. If you're not sure how to reach your healthcare provider, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.

Selenium - Last updated on December 15, 2021



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