



Manganese

Answers to Frequently Asked Questions

What is manganese?

Manganese (man-guh-nee-z) is an element found naturally in rocks and soil. Pure manganese is a silver-colored metal; however, it is not found in nature as a pure metal. Instead, it is combined with other elements like oxygen and sulfur.

Manganese is used to make steel, fireworks, batteries, fertilizer, paint, and cosmetics. It is also added to gasoline.

Manganese enters the air, water, and soil after it is released from factories, through mining, or from using products that contain manganese. All living things, like plants and animals, contain small amounts of manganese in them.

Manganese is an essential (needed) nutrient. People need a small amount of it each day to stay healthy. Most people get all the manganese they need from their diet. Foods like beans, nuts, and grains can be rich in manganese. Normal levels of manganese will leave a healthy person's body through their feces after a few days.

Can manganese make me sick?

Although manganese is an essential nutrient, you can get sick from breathing, eating, or drinking (exposure) too much of it.

Whether or not you will get sick depends on:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- Your general health, age, and lifestyle. Young children, the elderly, and people with chronic (on-going) health problems are more likely to get sick.

A person who is most likely to get sick from manganese is someone in poor health who was often exposed to a large amount of manganese for a long time.

Remember that eating a normal amount of manganese in your diet is healthy and should not cause any problems.

What health problems can manganese cause?

Breathing manganese dust can cause irritation and inflammation (swelling) in your lungs, like the problems caused by breathing in pollen. This could cause pneumonia.

People who are exposed to very high levels of manganese for a long time are at risk for permanent nervous system damage. This is called manganism (man-guh-niz'um). Signs of manganism can include:

- Feeling weak, clumsy, or slow when you move
- Speaking slowly or taking long pauses when you talk
- Having mood changes, like feeling irritable (angry), feeling nervous, or losing your sex drive
- Other problems like weight loss and muscle pain

Who is at risk?

Some people may have more contact with higher levels of manganese. These people include:

- Workers in a factory where manganese metal is produced or where manganese is used to make steel or other products.
- People living near a factory that releases a large amount of manganese dust into the air.
- People living near a coal or oil-burning factory. Manganese dust is released into the air when these fuels are burned.
- People who do not correctly use pesticides (bug sprays) that contain manganese.
- Smokers and people who are around smokers. Tobacco smoke contains small amounts of manganese.



People who work in or live near factories that create manganese dust may be exposed to higher levels of manganese. (Image source: Shutterstock)

How does manganese affect children?

Just like adults, children need a small amount of manganese from their diet every day so that they can grow and stay healthy.

If children are exposed to high levels of manganese for a long time, they may develop nervous system problems like manganism. Some studies show that children who are exposed to very high levels of manganese may have problems with brain development, which could cause issues in their ability to learn and remember.

Because manganese is found naturally in soil and rocks, adults should make sure that children do not put soil into their mouth when they play outside. Children should wash their hands after playing in the soil. Families with children who live near factories that make manganese dust should be especially careful since the dust can land in the soil where their children play.



Children are more likely to play in soil than adults. Because soil may have manganese, adults should watch their children to make sure they do not put soil in their mouth. (Image source: Shutterstock)

Can a medical test show if I have been exposed to manganese?

There are different tests to show levels of manganese in a person's body. Fluids like blood, urine, and feces can be used to measure for high levels of manganese. Scalp hair can also be used.

Keep in mind that these tests may show the amount of manganese in your body, but they cannot tell you whether you will have health problems. These tests also cannot tell you where the manganese came from.

Does manganese cause cancer?

The U.S. Environmental Protection Agency (EPA) does not have enough scientific proof to know whether or not high levels of manganese can cause cancer.

How does the federal government protect my health from manganese?

The federal government develops regulations and recommendations to protect the public from the harmful effects of manganese. Sometimes, regulations can be required by law. Different agencies set guidelines for:

- Drinking Water. For public water systems, the U.S. EPA has developed different levels of health advisories based on the how long someone is exposed and their age and weight.
 - For 1 to 10 days of exposure to a child, the health advisory limit is 1 part per million of manganese (or 1 milligram per liter).
 - For a lifetime of exposure to an adult, the health advisory limit is 0.3 parts per million (or 0.3 milligrams per liter).
- Bottled Water. The U.S. Food and Drug Administration (FDA) recommends that for every 1 million parts bottled water, there should be no more than 0.05 parts manganese (0.05 ppm, or 0.05 mg/L).
- Workplace Air. The Occupational Safety and Health Administration (OSHA) sets a legal limit on how much manganese can be in the air at your workplace. For every 1 million parts air, there can be no more than 2.23 parts manganese (5 mg/m³). Having more than that amount of manganese in workplace air during an 8-hour work day is against the law.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2012. Toxicological profile for manganese. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where Can I Get More Information?

Ohio Department of Health
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