

Cobalt - ToxFAQs™



What is cobalt?

Cobalt (Co) is a naturally occurring element found in rocks, soils, water, and air. Alloys produced with cobalt metal are used in the manufacture of aircraft engines, magnets, grinding and cutting tools, and medical devices and prosthetics. Cobalt is used in the manufacturing processes for some forms of plastic. Cobalt compounds are used to color glass, ceramics, paints, and cosmetics. Cobalt is also used as a drier for porcelain enamel and paints. The general population is exposed to low levels of cobalt in air, water, food, and cosmetics. Vitamin B₁₂, which is essential for good health at low levels, contains cobalt. Therefore, everyone has trace levels of cobalt in their body. Several radioactive isotopes of cobalt exist. Radioactive cobalt is used for commercial and medical purposes. ⁶⁰Co (read as cobalt sixty) is used for sterilizing medical equipment and consumer products, radiation therapy for treating cancer patients, manufacturing plastics, and irradiating food to increase shelf life. ⁵⁷Co is used in medical and scientific research.

What happens to cobalt in the environment?

- Cobalt enters the environment from natural sources, during burning coal or oil, and through the production and use of cobalt alloys.
- In the air, cobalt combines with particles that then settle to the ground within a few days.
- Cobalt released into water or soil will stick to other particles. Some cobalt compounds may dissolve.
- Radioactive cobalt decays or changes into a stable non-radioactive substance. Half of ⁶⁰Co decays in 5.27 years and half of ⁵⁷Co decays in 272 days.

Cobalt is beneficial to human health in minimal quantities but can be harmful in large amounts. It is a part of vitamin B₁₂, which is crucial to human health at recommended levels.

How can I be exposed to cobalt?

- Food is a primary source through which you can be exposed to low levels of cobalt. You can also be exposed to cobalt by breathing air or drinking water. Very small amounts of cobalt may leach into food or water stored in certain types of plastic containers. A small portion of the cobalt is in vitamin B₁₂ as an essential trace element important to health. Some exposure is possible from medical devices and prosthetics.
- You can also be exposed to low levels of cobalt in cosmetics if the product you use (some eye shadows, face paints, lipsticks, and skin creams) contains cobalt as an ingredient. There is no evidence that living near agricultural areas that use sewage sludge, fertilizers, or amendments that contain cobalt would expose you to higher than normal levels of cobalt.
- Occupational exposure can happen by working in industries that make or use cutting or grinding tools; mine, smelt, refine, or process cobalt metal or ores; or produce cobalt alloys or use cobalt.
- The general population is rarely exposed to radioactive cobalt. Some radiation therapy patients may be exposed to radiation from cobalt located inside a therapy machine. Workers at nuclear facilities, irradiation facilities, or nuclear waste storage sites may be exposed to small amounts of radioactive cobalt.

How can cobalt affect my health?

Breathing cobalt particles can cause breathing difficulty and cause damage to your nose, throat, and lungs over time. Oral exposure to cobalt may cause adverse effects in the blood and thyroid. Skin contact with cobalt particles may cause skin irritation and discoloration. Exposure to radiation from any radioactive material or radiation exposure device can damage cells in your body. The health effects of ionizing radiation from cobalt are addressed in the [ToxFAQs for Ionizing Radiation](#).

Cobalt

Can cobalt cause cancer?

Several agencies and organizations, both in the United States and internationally, have reviewed studies and have assessed whether cobalt and cobalt compounds are carcinogens (substance causing cancer).

The National Toxicology program under [U.S. Department of Health and Human Services \(DHHS\)](#) has classified cobalt and cobalt compounds that release ions inside the body as reasonably anticipated to be a human carcinogen based on evidence from human and animal studies. Vitamin B₁₂ is not included since it is not one of these substances.

The [U.S. Environmental Protection Agency \(EPA\)](#) is currently conducting a cancer risk assessment for cobalt and cobalt compounds.

The [International Agency for Research on Cancer \(IARC\)](#) has classified soluble cobalt salts as probably carcinogenic, cobalt oxide as possibly carcinogenic, and cobalt tetroxide, cobalt sulfide, and other cobalt compounds as not classifiable as to their carcinogenicity to humans.

Cancer from exposure to ionizing radiation released from radioactive cobalt is addressed in the [ToxFAQs for Ionizing Radiation](#).

Can I get a medical test to check for cobalt?

Cobalt levels can be tested in the urine, feces, and blood within a couple of days of exposure. It is not known if breath samples are useful. Your doctor can take samples, but must send them to a laboratory to be tested.

Tests are available to determine if you have been exposed to very high doses of ionizing radiation or if you have radioactive material in your body. These tests are not available at your doctor's office. For more information, please see the [ToxFAQs for Ionizing Radiation](#). The amount of cobalt in your urine, feces, or blood can be used to estimate how much cobalt you were exposed to. However, these tests cannot predict whether you will experience any health effects.

How can I protect my family from cobalt exposure?

Children should avoid playing in soils near hazardous waste sites where cobalt may be present. Safely store cobalt powders, crystals, or dusts away from children, pets, or other adults. Monitor your cobalt intake if you are adding more cobalt to your diet, such as from dietary supplements like vitamin B₁₂, which contains cobalt, to make sure you are not eating too much. Talk to your doctor, nurse, or clinic to figure out if you are taking the proper amount of cobalt. If you work with cobalt, it is important to wear the necessary protective clothing and equipment, and always follow safety procedures. Shower and change your clothes before going home each day if that is indicated by employers or safety data sheets. Additionally, workers exposed to radioactive cobalt should also be checked for contamination.

For more information:

Call **CDC-INFO** at 1-800-232-4636, or submit your question online at <https://wwwn.cdc.gov/dcs/ContactUs/Form>

Go to ATSDR's Toxicological Profile for Cobalt: <https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=373&tid=64>

Go to ATSDR's Toxic Substances Portal: <http://www.atsdr.cdc.gov/substances/index.asp>

Find & contact your ATSDR Regional Representative at http://www.atsdr.cdc.gov/DRO/dro_org.html

