

# 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 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 B<sub>12</sub>, which is essential for good health at low levels, contains cobalt. At sufficiently high levels, cobalt adversely affects respiratory and hematological systems. This chemical has been found in at least 426 of the 1,636 National Priorities List sites identified by the Environmental Protection Agency (EPA). Cobalt exists in both radioactive and non-radioactive forms. Several radioactive isotopes of cobalt exist. Radioactive cobalt is used for commercial and medical purposes. <sup>60</sup>Co (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. <sup>57</sup>Co 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 <sup>60</sup>Co decays in 5.27 years and half of <sup>57</sup>Co 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 B<sub>12</sub> 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. Food is the largest sources of exposure to cobalt for the general population and levels in most foods are low. A small portion of the cobalt is in vitamin B<sub>12</sub> 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 that 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 and its radiation.

## How can cobalt affect my health?

Exposure to high levels of cobalt can result in adverse effects to blood, lungs, and skin. Liver effects have also been observed in animals exposed to high levels of cobalt. 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 or other radioactive materials are addressed in the [ToxFAQs for Ionizing Radiation](#).

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## 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 B<sub>12</sub> is not included since it is not one of these substances.

The [U.S. Environmental Protection Agency \(EPA\)](#) has not classified cobalt for carcinogenicity.

The [International Agency for Research on Cancer \(IARC\)](#) has classified cobalt and cobalt compounds as “possibly” carcinogenic to humans (2B), which means there is sufficient evidence that they cause cancer in animals, but inadequate evidence that they cause cancer in 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 B<sub>12</sub> 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.

### Want 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](#)

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

If you have any more questions or concerns, you can also find & contact your ATSDR Regional Representative at [http://www.atsdr.cdc.gov/DRO/dro\\_org.html](http://www.atsdr.cdc.gov/DRO/dro_org.html)

