

Cadmium

FactSheet



Saskatchewan
Ministry of
Health



What is cadmium?

Cadmium is a natural element in the earth's crust. All soils and rocks contain some cadmium. It is present in the Canadian environment as a result of natural processes such as forest fires, volcanic emissions and weathering of soil, till, and bedrock.

Human activity also contributes to cadmium in the environment. Cadmium is present in coal and mineral fertilizers. Cadmium can enter soil, water and air from mining, refining, other industry, burning coal and other fossil fuels and from household wastes. Cadmium does not corrode easily and has many uses, including batteries, pigments, metal coatings and plastics.

What happens to cadmium when it enters the environment?

- Cadmium does not break down in the environment, but can change forms.
- Cadmium particles in air can travel long distances before falling to the ground or water.
- Some forms of cadmium dissolve in water.
- Cadmium binds strongly to soil particles.
- Fish, plants, and animals take up cadmium from the environment.

How are people exposed to cadmium?

- Smoking cigarettes or breathing cigarette smoke.
- Eating foods containing cadmium; low levels are found in all foods (foods that usually contain more cadmium include shellfish, liver, and kidney meats).
- Breathing contaminated air in certain workplaces (e.g. battery manufacturing, metal soldering, welding, metal smelting).
- Drinking contaminated water.
- Living near an industrial facility that releases cadmium into the air.
- Burning of fossil fuels.

Based on estimates of the average daily intake of cadmium from air, drinking water, food and soil for various age groups in the general population, smoking causes the most significant exposure to cadmium. For non-smokers, food is likely the most significant source of human exposure in Canada.

How can cadmium affect health?

Breathing very high levels of cadmium can damage the lungs. Eating food or drinking water with very high levels irritates the stomach, leading to vomiting and diarrhea.

Long-term exposure to lower levels of cadmium leads to a buildup of cadmium in the kidneys and possibly kidney damage. Other potential long-term effects, but not confirmed for humans, are lung damage, high blood pressure and weak painful bones.

The U.S. Environmental Protection Agency has determined that cadmium probably causes cancer in humans, with exposure being primarily associated with lung cancer.

How can cadmium affect children?

The health effects in children are expected to be similar to the effects seen in adults (kidney, lung, and bone damage depending on the type of exposure).

A few studies in animals indicate that younger animals absorb more cadmium than adults. Animal studies also indicate that the young are more susceptible than adults to a loss of bone and decreased bone strength from exposure to cadmium.

It is uncertain if cadmium causes birth defects in people. Harmful effects on child development or behaviour have not generally been seen in populations exposed to cadmium, but more research is needed. Young animals exposed to high levels of cadmium before birth had changes in behavior and learning ability. There is also some information from animal studies that high exposure to cadmium before birth can reduce body weights and affect the skeleton in the developing young.

How can families reduce the risk of exposure to cadmium?

- Do not smoke tobacco products. Cadmium accumulates in tobacco leaves. Do not allow smoking in enclosed spaces like inside the home or car in order to limit exposure to children and other family members.
- If you work with cadmium, use all safety precautions to avoid carrying cadmium-containing dust home from work on your clothing, skin, hair, or tools.
- In the home, store substances that contain cadmium safely, and keep nickel-cadmium batteries out of reach of young children. Dispose of batteries properly.
- A balanced diet can reduce the amount of cadmium taken into the body from food and drink.

Is there a medical test to determine exposure to cadmium?

Cadmium can be measured in blood, urine, hair or nails. Urinary cadmium has been shown to accurately reflect the amount of cadmium in the body.

The amount of cadmium in blood shows recent exposure to cadmium. The amount of cadmium in urine shows both recent and past exposure. The average blood cadmium of Canadians aged six to 79 is 0.35 micrograms/litre (mcg/L). This level is similar to the general population of the United States and Germany.

Further information

<http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=47&tid=15>

Manitoba

Health Links-Info Santé: 788-8200 or 1-888-315-9257 (toll-free)

Saskatchewan

HealthLine at 1-877-800-0002