

Cadmium

Cadmium is a heavy metal that is produced during the smelting of other metals, such as zinc lead and copper. Cadmium is most frequently used in the manufacture of nickel-cadmium rechargeable batteries found in mobile phones and cordless equipment. It is also used in metal plating, some paints, plastics and fertilisers and is found in cigarette smoke.

Exposure to cadmium occurs mostly in the workplace where cadmium products are made. The general population can be exposed to cadmium from cigarette smoke or eating cadmium-contaminated foods. Cadmium can affect the kidneys, lungs, and bones.

High-risk occupations and hobbies

Some of the occupations that directly involve cadmium and carry a higher risk of exposure include:

- Battery manufacture
- Jobs involving welding or soldering
- Smelting
- Mining
- Textile work
- Cadmium alloy manufacture or use
- Manufacture of materials that contain cadmium, such as certain paints and plastics
- Jewellery making
- Stained glass window making
- Municipal solid waste recovery workers.

Sources of exposure outside the workplace

Other ways people may be exposed to cadmium include:

- **Cigarette smoking** – cigarettes contain cadmium and smokers inhale cadmium when they smoke. Smokers may receive twice the daily dose of cadmium as non-smokers. People breathing cigarette smoke can also inhale cadmium.
- **Food** – vegetables, like potatoes and leafy vegetables, and cereal grains grown in contaminated soils with high levels of cadmium may contain small amounts of cadmium. Kidneys and livers of animals and shellfish can contain higher levels of cadmium than other foods.
- **Industrial areas** – some industrial processes, such as metal smelting, release cadmium into the air. Controls are placed on industry to limit emission levels and ensure protection of public health.
- **Fertilised soils** – in agricultural areas, phosphate fertilised soils may contain higher levels of cadmium than unfertilised soils.

Health effects

It is unlikely that the general population would be exposed to a level of cadmium high enough to cause adverse health effects.

The health effects associated with cadmium exposure depend on the way people are exposed to cadmium, how much has entered the person's body, how long the person has been exposed for, how the person's body responds to the exposure. Once cadmium enters the body, it is stored in the liver and kidneys, and then slowly excreted in urine.

Inhalation

Inhalation is the main way workers are exposed to cadmium. Safe levels and standards of exposure are enforced to protect workers' health. These standards are set below levels which are thought to cause adverse effects.

Breathing air with high levels of cadmium over a short period of time is initially like the flu with chills, fever and muscle pain, then later can cause lung damage, shortness of breath, chest pain and cough, which may lead to death in severe cases.

Breathing lower levels of cadmium over a longer period of time can lead to kidney disease and cause bones to become weaker.

Ingestion

Eating food or drink contaminated with high levels of cadmium can cause stomach irritation, abdominal cramps, nausea, vomiting and diarrhoea. Headaches and flu-like symptoms, swelling of the throat and tingling hands may also occur.

Only a small amount of cadmium remains in the body after eating food contaminated with cadmium, but if consumed over a long period of time, cadmium can lead to kidney disease and cause bones to become weaker.

Large amounts of cadmium can damage the kidney, liver and heart and in severe cases may cause death.

Effects on children and babies

Children exposed to cadmium should have the same symptoms as adults. Small amounts of cadmium may be found in the breast milk of women who were exposed to high cadmium levels.

Mothers exposed to high levels of cadmium in their workplace may have children with lower birth weights. Exposure to cadmium at normal environmental levels is not likely to cause mothers to have babies with low birth weights.

Carcinogenicity

Cadmium and its compounds are classified as causing cancer, but there is no evidence that cadmium causes cancer at the low levels normally found in the environment. Breathing cadmium in the air can cause lung cancer, but ingesting contaminated food or drink is not thought to cause cancer.

Testing and treatment for cadmium

If you think you have been exposed to high levels of cadmium, you should seek advice from your doctor.

Urine or blood tests can measure cadmium levels in the body. Tests are also available to check the health of the kidneys and liver. The accuracy of hair and nail tests in measuring the extent of cadmium exposure has not been determined.

There is no specific treatment for cadmium poisoning, but supportive medical care may be required. Reducing the risk of further exposure is the most important step in managing people exposed to lower levels of cadmium over a longer period of time.

Reducing the risk of exposure

Suggestions to reduce the risk of exposure to cadmium include:

- Stop smoking. Cigarette smoke contains cadmium that can be absorbed through the lungs.
- Try to avoid inhaling other people's cigarette smoke.
- Eat a healthy balanced diet with only moderate amounts of shellfish and organ meats.
- If your job or hobbies involve handling cadmium, always use appropriate personal protective equipment and consider having your cadmium levels checked regularly by your doctor.

Cadmium batteries

Common alkaline batteries do not contain cadmium. However, nickel-cadmium rechargeable batteries used in mobile phones, cordless tools, laptop computers and digital cameras do contain cadmium. These batteries and equipment should be disposed of at appropriate waste disposal sites.

Where to get help

- Your doctor
- WorkSafe Victoria, Tel. (03) 9641 1444 or 1800 136 089 (toll free) – for general enquiries regarding cadmium in workplaces
- Department of Health, Environmental Health Unit, Tel. 1300 761 874 – for health information regarding cadmium
- Environment Protection Authority Victoria, Tel. (03) 9695 2722 – for information regarding the environmental impacts and disposal of cadmium

Things to remember

- Cadmium is a heavy metal with many uses, including the manufacture of rechargeable batteries.
- Exposure to cadmium can affect the kidneys, lungs and bones.
- Cigarette smoke contains high levels of cadmium.
- Blood and urine tests can measure the amount of cadmium present in the body.

This page has been produced in consultation with, and approved by:

Department of Health - Environmental Health Unit

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