衞生防護中心
Centre for Health Protection

衞生署
Department of Health

What you need to know about

antimony **cadmium** **chromium** **copper** **nickel**

in drinking water on health?

What are antimony, cadmium, chromium, copper and nickel and their health effects?

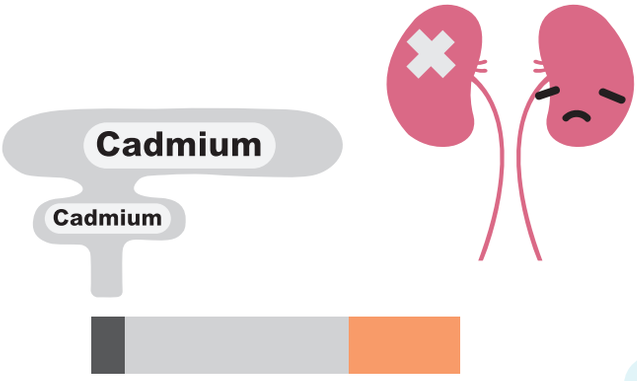
Antimony, cadmium, chromium, copper and nickel all are naturally occurring metals and widely present in the environment. These metals are used in different products of our daily life, including some plumbing materials. Chromium and copper are essential trace elements for our body. These metals may enter the human body mainly by mouth and breathing. Depending on the route, concentration and duration, exposure to these metals can be associated with a wide range of effects.

For more details, please visit the Centre for Health Protection, Department of Health's website at www.chp.gov.hk/en/view_content/40434.html

Antimony

Antimony is used as a replacement for lead in some soldering materials. Significant antimony exposures may occur in occupational settings, such as metal smelting, while total exposure from food and drinking-water is relatively low.

Ingesting large amount of antimony salt may exert a strong irritating effect on the gut and trigger sustained vomiting, abdominal cramps and diarrhoea.

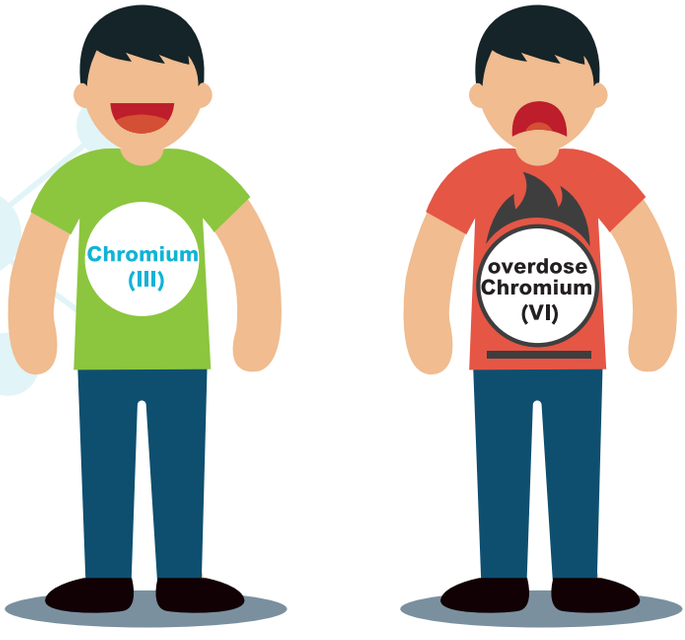


Cadmium has a number of industrial applications such as electroplating, pigment production, manufacture of plastic stabilisers, nickel-cadmium batteries and electronics. As a result of widespread environmental contamination, food is the main source of daily exposure to cadmium. Smoking is another major source of cadmium exposure.

Long term consumption of high level of cadmium may cause damage to the kidneys. Early symptom is the presence of protein in the urine. In addition, an even higher intake may increase the risk of bone fracture.

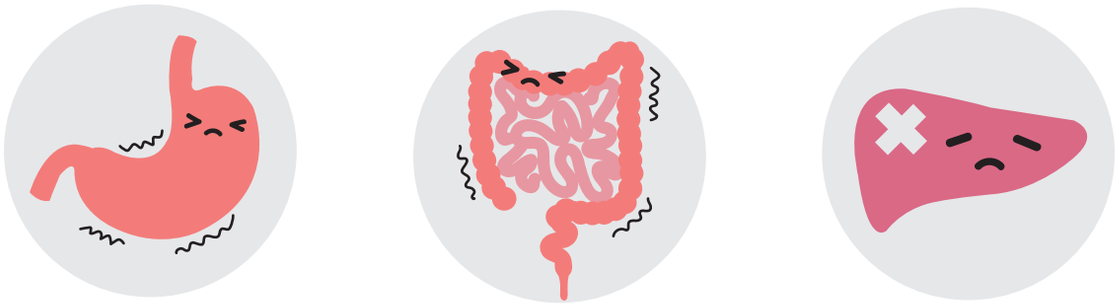
Chromium can exist in different chemical forms. Under non-occupational settings, food remains the major source of chromium intake.

Chromium (III) is an essential nutrient in the human body. On the other hand, Chromium (VI) is an oxidizing agent overdose of which can be harmful and may lead to gastrointestinal discomfort.



Copper is used to make pipes and valves, and is present in alloys and coatings. Food and water are the primary sources of copper exposure.

Copper is an essential nutrient for human. Excessive intake of copper may cause acute gastrointestinal effects and very high level consumption may cause liver and kidney injury.

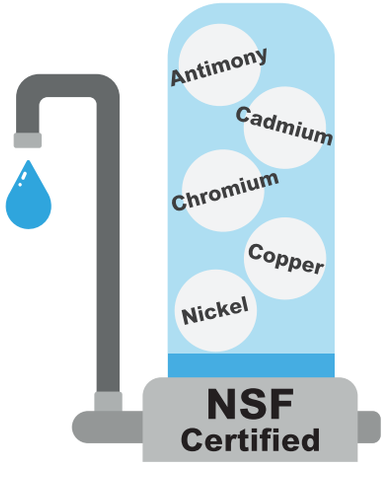


Nickel is used mainly in the production of stainless steel and nickel alloys. Food is the dominant source of nickel exposure in the non-smoking, non-occupationally exposed population. Intake from water is generally a minor contributor.

The most common effect of nickel on the human body is allergic contact dermatitis caused by nickel-containing metal (e.g. earrings, watch straps) touching the skin. Acute ingestion of high level of nickel can cause nausea, vomiting and diarrhoea. For individuals sensitised to nickel, ingestion of excessive nickel could induce allergy.

Even if drinking water which is contaminated with metals has been consumed, the level of metal exposure is substantially lower than that from occupational exposure, and is not likely to cause clinical poisoning. Universal screening for such metals in blood or urine samples among exposed individuals who do not have any symptom will not be helpful in identifying or managing clinical poisoning cases; moreover, such practice is not seen in other parts of the world. Cessation of consumption of contaminated water with metal concentration exceeding the respective World Health Organization's Guideline Value/Provisional Guideline Value is the most effective measure to be adopted by consumers. Moreover, it is most important that you find out the cause of contamination and avoid further metal intake from contaminated water at the same time. In the long term, problematic inside services, if any, should be replaced.

Some domestic water filters such as those certified by competent bodies including US National Sanitation Foundation (NSF) can reduce the levels of metallic contaminants in water. However, filters should be operated strictly in accordance with the manufacturers' operational guidelines with regular maintenance. For details about the water filters, please visit Water Supplies Department's website (http://www.wsd.gov.hk/en/faqs/index.html#8).



How to minimise exposure to the five metals in everyday life?

Good dietary practice

Eat a balanced diet so as to avoid excessive exposure to metallic contaminants from a small range of food items. Moreover, wash vegetables thoroughly particularly leafy ones in clean water before they are processed or consumed.

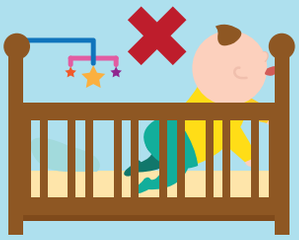
Good hygiene practice

Dust off your house regularly. Wash children's hands and face frequently to remove any dust and soil that contain metals.

Avoid common sources of exposure to the five metals

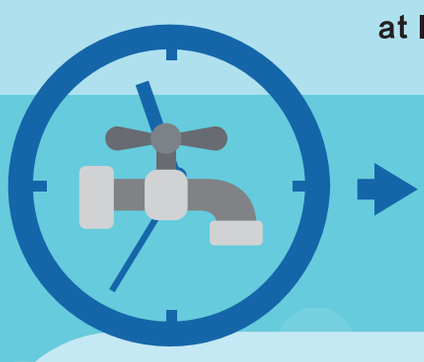
Quit smoking as it could be a significant source of cadmium and nickel exposure.

Do not allow children to swallow or chew paint fragment, or the paint surface of toys and furniture as these metals could be present in some paints.

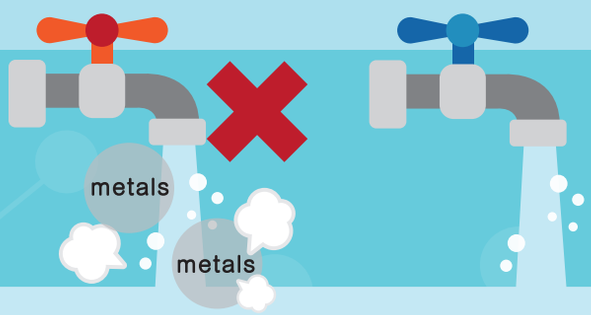


Cultivate good habits of water use

Run tap water for at least two minutes if the plumbing system has not been used for some time, for instance, after several hours or overnight.



As hot water increases the amount of metals that may leach from the plumbing materials, only water from a cold water tap should be used for drinking and cooking.



If you suspect that you have been exposed to high levels of metals for a prolonged period of time or that you have relevant symptoms, you should seek medical advice.

For information about the Enhanced Water Quality Monitoring Programme, please visit the Water Supplies Department's website at www.wsd.gov.hk/en/dwsewqmp.

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