



ARSENIC IN DRINKING WATER

The Issue

Arsenic is a natural element found widely in the earth's crust. It may be found in some drinking water supplies, including wells. Exposure to high levels of arsenic can cause health effects.

Background

There are trace amounts of arsenic in all living matter. For most Canadians, the primary source of exposure to arsenic is food, followed by drinking water, soil and air. Drinking water would only be the major source of exposure for people living near a source of arsenic.

Arsenic may enter lakes, rivers or underground water naturally, when mineral deposits or rocks containing arsenic dissolve. Arsenic may also get into water through the discharge of industrial wastes and by the deposit of arsenic particles in dust, or dissolved in rain or snow. These arsenic particles can enter the environment through:

- the burning of fossil fuels (especially coal);
- metal production (such as gold and base metal mining);
- agricultural use (in pesticides and feed additives); or
- waste burning.

Data collected indicate that the levels of arsenic in Canadian drinking water are generally less than 0.005 milligrams per litre (0.005 parts per million - ppm), although concentrations may be higher in some areas.

Testing For Arsenic

As arsenic is both tasteless and odourless, you won't be able to tell if it is in your drinking water. However, arsenic tends to be found in very specific regions of the country and may not be a drinking water concern in your area. If you live in an area that has natural sources of arsenic or is known to have high levels of arsenic in its groundwater, it is recommended that you have your water tested. To do so, please contact your regional public health office. If you obtain your drinking water from a municipal supply and want to have your water

tested, you should contact the local drinking water authorities.

Laboratories with specialized equipment can conduct tests to measure arsenic in your body. Testing for arsenic in urine will indicate recent exposure.

The Health Effects of Arsenic

Arsenic in drinking water is absorbed by the body when you swallow it, and distributed by the bloodstream. It does not enter the body through the skin or by inhalation during bathing or showering. The highest levels of arsenic are found in nails and hair, which accumulate arsenic over time. Your body gets rid of arsenic mostly through urine, with smaller amounts removed through the skin, hair, nails and sweat.

Health Canada and the International Agency for Research on Cancer consider arsenic a human cancer-causing agent. Its effects have been studied in a population in Taiwan where the drinking water contains naturally high levels of arsenic (over 0.35 ppm). The results suggest that consuming drinking water with very high levels of arsenic over a lifetime can increase the risk of cancer in internal organs such as the bladder, liver and lungs.

Long-term exposure (over many years or decades) to high levels of arsenic in drinking water may also cause:

- thickening and discoloration of the skin;
- nausea and diarrhea;
- decreased production of blood cells;
- abnormal heart rhythm and blood vessel damage; or
- numbness in the hands and feet.



Short-term exposure (days/weeks) to very high levels of arsenic in drinking water can result in:

- abdominal pain, vomiting and diarrhea;
- muscular cramping or pain;
- weakness and flushing of skin, skin rash;
- numbness, burning or tingling sensation or pain in hands and feet;
- thickening of the skin on the palms of the hands and soles of the feet; or
- loss of movement and sensory responses.

Studies do not show greater risks of health effects in children, pregnant women or other vulnerable populations.

Minimizing Your Risk

Because arsenic can cause cancer, every effort should be made to keep arsenic levels in drinking water as low as possible.

If you live in an area that has natural sources of arsenic or is known to have high levels of arsenic in its groundwater, you should have your well water tested. To do so, contact your regional public health office. If you find excessive concentrations of arsenic in your drinking water, you may want to:

- Look for an alternate water source with low arsenic concentrations. Where possible, connect to a public water distribution system.
- Buy an in-home water treatment device that can reduce the level of arsenic. Look for treatment devices that have been certified by an accredited certification organization as meeting the appropriate NSF International (NSF)/American National Standards Institute (ANSI) drinking water treatment unit standards for removing arsenic. These standards have been designed to safeguard drinking water. They help to ensure the material safety and performance of products that come into contact with drinking water.

Make sure you follow the manufacturer's instructions regarding their use and maintenance.

If you are concerned about health risks from the consumption of water containing arsenic, contact your doctor.

Government of Canada's Role

Federal, provincial and territorial governments share responsibility for providing safe drinking water in Canada. Health Canada works with the provinces and territories to establish the Guidelines for Canadian Drinking Water Quality. The guidelines are designed to ensure that Canadians have access to safe drinking water. They are constantly reviewed and revised to reflect new data on contaminants in drinking water. All jurisdictions in Canada use them as the basis for establishing drinking water quality requirements.

Arsenic is one of the many chemicals for which Health Canada has set guidelines. A new guideline has been established at 0.010 milligrams per litre, and will continue to be reviewed to reflect new treatment methods and new information on health risks as they become available. The guideline is based on lifetime exposure to arsenic from drinking water, and takes into consideration the ability to measure arsenic and to remove it from drinking water supplies.

Need More Info?

For information regarding Health Canada's drinking water program, visit our Web site at:
<http://www.healthcanada.gc.ca/waterquality>

You can also send requests by e-mail to water_eau@hc-sc.gc.ca. or by regular mail to:
Water, Air and Climate Change Bureau
Health Canada
269 Laurier Ave. West, al 4903D
Ottawa, Ont K1A 0K9

Specific information on Health Canada's drinking water guidelines, including links to guideline technical documents, can be found at
http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/index_e.html

The day-to-day responsibility of providing safe drinking water to the public generally rests with the provinces and territories, while municipalities usually oversee the day to day operations of the treatment facilities. In the Yukon, Northwest Territories, Nunavut, British Columbia and New Brunswick water quality is overseen by the provincial health ministries.

For more information go to:
http://chp-pcs.gc.ca/CHP/index_e.jsp?pageid=10042

In all other provinces water quality is overseen by the environment ministries.

For more information on water quality issues go to Health Canada's Water Talk site at:
http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/water_talk-parlons_eau_e.html

For additional articles on health and safety issues go to the It's Your Health Web site at:
www.healthcanada.gc.ca/iyh
You can also call toll free at 1-866-225-0709
or TTY at 1-800-267-1245*