



ARSENIC IN DRINKING WATER

The Issue

Arsenic has been recognized as a poison since ancient times. Understandably, the public may have concerns about low levels of arsenic found in some municipal water supplies and in some private wells.

Background

Arsenic is a natural element widely found in the earth's crust. There are trace amounts of it in all living matter. 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 deposition of arsenic particles in dust or dissolved in rain or snow. These arsenic particles can get into 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 by waste burning.

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

The Health Effects of Arsenic

Arsenic in drinking water is absorbed by the body, with the bloodstream taking it to various organs. The highest levels are found in nails and hair, which accumulate arsenic over time. Your body gets rid of

arsenic mostly through the urine with smaller amounts removed from the body through the skin, hair, nails and sweat.

The International Agency for Research on Cancer considers arsenic a human carcinogen. Consuming drinking water that contains arsenic at levels close to or higher than the guideline value over a period of years has been found to increase the risk of skin cancer and tumours of the bladder, kidney, liver and lung.

Long-term exposure (over years) to higher levels of arsenic in drinking water may also cause:

- thickening and discoloration of the skin;
- nausea and diarrhoea;
- decreased production of blood cells;
- abnormal heart rhythm and blood vessel damage; and
- 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 diarrhoea;
- muscular cramping or pain;
- weakness and flushing of skin, skin rash;
- numbness, burning or tingling sensation or pain in extremities (hands and feet);



- thickening of the skin of the palms of the hands and soles of the feet; and
- deterioration of motor and sensory responses.

Testing for Arsenic

Arsenic is both tasteless and odorless. This makes it impossible for the average person to detect it in drinking water. However, arsenic tends to be found in specific regions of the country. Residents who live in areas that have natural sources of arsenic or are known to have high levels of arsenic in groundwater, should have well water tested. This can be done by contacting the regional public health office. To have drinking water from a municipal supply tested, contact local authorities.

A water supply found to have an arsenic levels above the Canadian Drinking Water Quality Guideline of 0.025 milligrams per litre, should not be used for drinking or for food preparation.

Laboratories with specialized equipment can conduct tests to measure arsenic in your body. Testing for arsenic in urine will indicate recent exposure. If you are concerned about health risks from the consumption of water containing arsenic, contact your doctor.

Minimizing Your Risk

Because arsenic can cause cancer, you should try to reduce the arsenic level. Steps you might want to take to reduce arsenic levels in well water include:

- Extend the well casing into deeper groundwater or drill a new well into another aquifer.
- Where possible, connect to a public water distribution system.
- Invest in an in-home water treatment device that can reduce the level of arsenic. Since the manufacture and sale of these water treatment devices are not currently regulated in Canada, it is important that you choose your product with care. Look for those certified to health-based standards or check with the Standards Council of Canada. All of these devices should be maintained continuously to ensure that they are working properly.

Government of Canada's Role

Federal, provincial and territorial governments share responsibility for providing safe drinking water in Canada. Health Canada, working with the provinces and territories, establishes the Guidelines for Canadian Drinking Water Quality to ensure that Canadians have access to safe drinking water. The guidelines are constantly reviewed and revised to reflect new data on contaminants in drinking water. An updated table summary is published annually by Health Canada. All provinces and territories use the Guidelines as the basis to establish their own enforceable requirements for drinking water quality.

Arsenic is one of the many chemicals for which Health Canada sets guidelines. The current guideline has been set at 0.025 milligrams per litre (parts per million). This

guideline is considered to be an interim measure until an appropriate treatment technology is developed to further reduce arsenic levels in drinking water. The guideline will be reviewed to reflect new treatment methods and new information on health risks.

Health Canada monitors international arsenic-related activities such as those of the World Health Organization and the U.S. Environmental Protection Agency. These organizations also review the available information.

Need More Info?

For more information on Health Canada's water quality program and the arsenic guidelines, visit our Water Quality Website at www.hc-sc.gc.ca/waterquality or send an e-mail to water_eau@hc-sc.gc.ca.

Standards Council of Canada
<http://www.scc.ca/>

Other Web sites of interest include: World Health Organization (WHO) - Arsenic in drinking water
<http://www.who.int/inf-fs/en/fact210.html>

U.S. Environmental Protection Agency
<http://www.epa.gov/safewater/dwhealth.html>

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