

Health Information on Arsenic

Arsenic in drinking water can have serious short and long-term health effects.

Acute Health Effects

The symptoms of acute arsenic poisoning are stomach pain, vomiting, diarrhea, muscle pain and weakness, and flushing of the skin. These effects are typically seen at arsenic concentrations above 1200-micrograms/L. However in children with high fluid intake acute poisoning has been seen with concentrations in the range of 200-micrograms/L.

Chronic Health Effects

Long-term exposure to lower concentrations of arsenic can produce a number of chronic adverse health effects. The skin can become thickened, heavily pigmented, or develop multiple wart-like lesions. Blood vessels in the extremities can be damaged, affecting the blood supply to the feet and hands. Chronic exposure to arsenic can also be a cause of high blood pressure.

However of most concern is the fact that arsenic is a known cause of cancer. Chronic exposure to arsenic in the drinking water (over the course of a lifetime) can lead to several types of skin cancer, and cancers of the lung, liver and bladder.

It is the ability to cause cancer that is the critical health effect used in deciding the standards for arsenic in drinking water.

What are the Current Drinking Water Standards?

The Guidelines for Canadian Drinking Water Quality published by Health Canada set a Maximum Acceptable Concentration (MAC) of 0.010 mg/L (10 micrograms/L).

This MAC is based on the ability of municipal treatment facilities and residential water treatment devices to reduce arsenic concentrations to 0.010 mg/L or less. It is set at a level that is higher than would be associated with an “essentially negligible” risk of lung, bladder and liver cancers (1 new case per 100,000 people).

At 0.005 mg/L the estimated lifetime additional risk of these cancers is 2 – 20 cases per 100,000 people exposed. These are cancer cases over and above the cases due to other causes that would occur in the population anyway.

At 0.010 mg/L the additional risk of these internal organ cancers is 3 – 39 cases per 100,000 people exposed.

It is only at concentrations of arsenic of 0.0003 mg/L or less that the risk could be considered “essentially negligible”.

The risks associated with consumption of water containing arsenic are the same for everyone. Groups such as children and pregnant women are not at any greater risk of developing health problems from exposure to arsenic than the general population.

Conclusions

1. Arsenic is a human carcinogen, which means that exposure to any level in drinking water may increase the risk of cancer.
2. At low concentrations of arsenic the increased risk of lung, bladder, liver and skin cancer is small when compared to the number of cases that occur in populations that are not exposed to arsenic.
3. Lowering the concentration of arsenic in your drinking water will lower your lifetime risk of developing lung, bladder, liver and skin cancer.
4. However at low arsenic concentrations the treatment costs may be large for a small reduction in risk.