



# Arsenic

## Answers to Frequently Asked Health Questions

### What is arsenic?

Arsenic (As) is a common element found in the Earth's rocks and soils. Arsenic has no smell or taste.

### Where is the arsenic found in nature?

Arsenic is found in certain types of rocks and soils. Different parts of Ohio have different rock formations. Ohio's soils typically contain concentrations of arsenic between 0.5 and 56.0 parts per million (0.5 - 56.0 ppm), with an average value of 5.72 ppm.

Certain types of arsenic can dissolve in water. Ohio's groundwater contains naturally-occurring arsenic levels between 5 and 50 parts per billion (5-50 ppb).

### Types of arsenic (both types occur naturally):

- Organic arsenic: This type can be found in many foods, especially seafood, and is less likely to cause health problems than inorganic arsenic.
- Inorganic arsenic: This type can be found in the drinking water and can cause health problems at high levels of exposure. \* Very high levels of inorganic arsenic in food or water can cause serious, sudden health problems or even death.

### How do higher levels of arsenic get in the environment and your body?

**Soils:** Most arsenic in Ohio soils is naturally-occurring.

- Children can come into dermal (skin) contact with arsenic when playing outside in contaminated soils. Young children will often engage in hand-to-mouth actions where they can ingest the arsenic.
- People who have gardens or flower beds can also come in contact with arsenic contaminated soils through dust inhalation or ingestion.
- People who eat (ingest) food that was grown in arsenic contaminated soils can also come into contact with arsenic.
- Although people can breathe arsenic in dust, there are not significant airborne sources of arsenic in Ohio (i.e. arsenic smelters).

**Water:** Arsenic can dissolve into the groundwater (underground drinking water) and can contaminate and impact drinking water sources.

- Humans then drink (ingest) the contaminated water.

**Air:** Arsenic can be released into the air when arsenic-containing materials are burned.

- People can then breathe the arsenic contaminated smoke and vapors (inhalation).



### Who is more likely to come in contact with higher levels of arsenic?

We all have a small amount of arsenic in our bodies but people can come into higher levels from the following sources:

- Private well users that live in areas with higher levels of natural arsenic in their well water.
- Kids who play outside in dirt with high levels of arsenic.
- People who have gardens or flower beds in soils with higher arsenic levels.
- People who drink water contaminated by a nearby chemical plant or hazardous waste site.

### Can you get sick from arsenic?

Yes, you can get sick from arsenic. But getting sick will depend on the type of arsenic and the contact (exposure) you had with this chemical.

### Getting sick from exposure (contact) with arsenic depends upon the following:

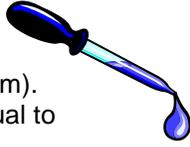
- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle  
Young children, the elderly and people with chronic (on-going) health problems are more at risk to chemical exposures.

### Routes of exposure:

- Eating and drinking (ingestion) – Main route.
- Breathing (inhalation) – Lesser route of exposure.
- Skin contact (dermal contact) – Not readily absorbed through skin, unlikely route of exposure.

## How is arsenic measured?

Arsenic is measured (counted) in parts per billion (ppb) and/or parts per million (ppm). One part per billion (1.0 ppb) would be equal to one drop of water in an Olympic-sized pool.



## How does arsenic harm your health?

If you were to drink water with arsenic levels of 300+ parts per billion (300+ ppb) every day, and over many years, you may experience some of the following health problems:

- Long-term contact with inorganic arsenic may cause the skin to darken and the growth of small "corns" or "warts" on the palms of the hand, bottom of the feet (soles), and on the trunk of the body (torso).
- A feeling of "pins and needles" on the hands and feet.
- Nausea (upset stomach), vomiting, and diarrhea.
- The body will make less red and white blood cells which help fight disease.
- Make note a deadly dose of arsenic would be 60,000 ppb or more.

## Does arsenic cause cancer?

Yes. The U.S. Department of Health and Human Services 12<sup>th</sup> Report on Carcinogens states arsenic is *known to be a human carcinogen* (causes cancer).

Eating or drinking (ingesting) high levels of inorganic arsenic (300+ ppb, daily for decades) increases the risk of getting skin cancer. It also increases the risk of developing tumors of the bladder, kidney, liver and lungs.

In 2001 the United States Environmental Protection Agency (U.S. EPA) lowered the Maximum Contaminant Level (MCL) of arsenic allowed in public water systems from 50 ppb down to 10 ppb. The new MCL of 10 ppb is set at a **very** low level to be sure the risk of getting a cancer from arsenic is very, very small.

Make note that many drinking water wells in Ohio may have natural levels of arsenic that go above the new MCL. Although the U.S. EPA said there is no extreme risk to health by drinking water with arsenic levels between 10 - 50 ppb, people with private wells above 10 ppb may wish to drink bottled water or consider a water treatment system.

Contact the ODH, Residential Water and Sewage Program to learn about treatment systems that remove arsenic, or for a list of registered water treatment dealers call (614) 466-1390 or visit:

<http://www.odh.ohio.gov/en/odhprograms/eh/water/PrivateWaterSystems/main.aspx>



## Is there a medical test to show if you have been exposed to arsenic?

Yes, but since arsenic stays in the body a short time, you must get the test soon after an exposure. Also note these tests only look for high levels of arsenic (150+ ppb) and are not useful for low-level exposures.

### Types of tests:

- Urine test. This the most trusted test for arsenic exposure.
- Testing hair or fingernails. This can measure your exposure to high levels of arsenic over the past 6-12 months. It is not good for testing low levels.

**Note:** These tests will show the amount of arsenic in your body but cannot tell you whether you will have any harmful health problems. These tests also do not determine where the arsenic came from.

## Where can I get more information?

Ohio Department of Health  
Bureau of Environmental Health  
Health Assessment Section  
246 N. High Street  
Columbus, Ohio 43215  
Phone: (614) 466-1390  
Fax: (614) 466-4556

### References:

ATSDR Toxicological Profile on Arsenic, 1999.

Report on Carcinogens, 12<sup>th</sup> Edition.

Arsenic in Drinking Water. Minnesota Department of Health, 1999.

Arsenic Facts for Public Water System Customers. Ohio Environmental Protection Agency. March 2002.

Ohio Department of Health, Health Assessment Section  
Arsenic Contamination in Gardens, 2012.

<http://www.odh.ohio.gov/~media/ODH/ASSETS/Files/eh/HAS/ArsenicinGardening.ashx>



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