

What is arsenic?

Arsenic is a naturally occurring element. In the pure form, it is a silver-gray, semi-metallic substance that tarnishes in air. However, arsenic is found in nature in various inorganic and organic compounds. Inorganic and organic arsenic compounds are white in color, and have no smell or special taste. Inorganic arsenic occurs naturally in certain types of soils and rock formations. Inorganic arsenic compounds are mainly used as a preservative in pressure-treated wood to make it resistant to rotting and decay. Organic arsenic compounds are usually not as toxic as inorganic arsenic compounds, but some are used to make insect killers, weed killers, and fungicides.

Who is exposed to arsenic?

Anyone can be exposed to arsenic since low levels of arsenic are present in soil, water, food, and air. People are primarily exposed to arsenic through eating food (fish and shellfish), drinking water, or breathing air containing arsenic. If wells are drilled in areas where naturally occurring arsenic is present in the soil or rock, drinking water can become contaminated with arsenic. Other sources of exposure are breathing in sawdust or burning smoke from arsenic-treated wood, living near hazardous waste sites, and living in areas with naturally elevated levels of arsenic in rock.

How can arsenic affect my health?

Inorganic arsenic can affect the skin, nervous system, respiratory system, kidneys, and gastrointestinal system. Long-term ingestion of inorganic arsenic can cause darkening of the skin and the appearance of small corns or warts on the palms, soles, and torso. Drinking water contaminated with high levels of inorganic arsenic has been associated with increased risk of skin, lung, bladder, and kidney cancer.

Breathing high levels of inorganic arsenic may cause a sore throat, lung irritation, and some of the mentioned skin effects. Though the exposure level that produces these effects is uncertain, it is likely more than 100 micrograms per cubic meter of air. Direct skin contact with inorganic arsenic compounds can cause skin irritation, including redness and swelling. Organic arsenic is much less harmful than the inorganic form of arsenic, but may cause similar health effects at high levels. Most arsenic consumed in seafood is in low-toxicity organic compounds.

How likely is arsenic to cause cancer?

Arsenic can cause skin cancer when people are exposed to it in high amounts for a long time, typically in drinking water in some areas where the bedrock is very high in arsenic.

How can arsenic affect children?

There is some evidence that long-term exposure to arsenic in children may result in lower IQ scores. There is also some evidence that exposure to arsenic in the womb and early childhood may increase mortality in young adults. Studies in animals show that large doses of arsenic that cause illness in pregnant females, can also cause low birth weight, fetal malformations, and even fetal death.

Is there a medical test to show whether I have been exposed to arsenic?

There are tests to measure the level of arsenic in blood, urine, hair, or fingernails. A urine test is the most reliable to determine arsenic exposure that has happened within a few days. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6-12 months. However, these tests cannot predict whether one will develop lung cancer or other harmful effects.

How can I reduce the risk of exposure to arsenic?

If you live in an area where there are naturally high levels of arsenic in the water or soil, limit your exposure to the soil and consider using municipal or bottled water. If you work in a job where you may be exposed to arsenic, understand that you may carry arsenic home with you on your clothes or in your hair. Be sure to shower and change your clothes before going home. If you use arsenic-treated wood, be sure to wear a dust mask, gloves, and protective clothing to reduce your exposure to sawdust.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a maximum permissible limit of 10 micrograms arsenic per cubic meter of indoor air per 8-hour shift and 40-hour work week. In January 2006, the U.S. Environmental Protection Agency (EPA) set a maximum contaminant level (MCL) for arsenic in drinking water at 10 parts per billion (ppb). The EPA Reference Dose (RfD) for inorganic arsenic is 0.0003 milligrams per kilogram body weight per day (mg/kg/day). The Agency for Toxic Substances and Disease Registry's (ATSDR) Minimal Risk Level (MRL) for acute oral ingestion is 0.005 mg/kg/day and chronic oral ingestion is 0.0003 mg/kg/day.

Where can I get more information on arsenic?

- If you have concerns about arsenic, contact your healthcare provider.
- Call your local health department. A directory of local health departments is located at <https://www.vdh.virginia.gov/local-health-districts/>.
- Contact the Virginia Department of Health at (804) 864-8182 or at toxicology@vdh.virginia.gov
- For additional information, please visit the Agency for Toxic Substances and Disease Registry page on arsenic at <http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=3>.