DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

# Frequently Asked Questions

## URANIUM

**What is uranium?**
Uranium is a naturally occurring radioactive element found in rocks, soil, air, and water. It occurs in the form of minerals, but not as a metal. Uranium is silver-colored and is nearly as strong as steel.

**Where can uranium be found and how is it used?**
Since radioactive elements send out energy as rays, waves, or particles, uranium is useful as fuel in nuclear power plants and weapons. One of the radioactive properties of uranium is half-life. Half-life is the time it takes uranium to send out half of its radiation and change into another substance. Since the half-life for uranium can be billions of years, it still exists in nature and has not all decayed away.

**How can people be exposed to uranium?**

You could be exposed to uranium through:

- **Breathing** air in a place that has a high level of uranium. Since uranium is found in coal ash, air near coal-fired power plants could have a high level of uranium.
- **Drinking** water from a place that has a high level of uranium, such as near a coal-fired power plant.
- **Eating** food grown in areas with high levels of uranium.
- **Touching** uranium at work, such as in a factory where radium is processed, or by touching phosphate fertilizers. Living near any kind of mine also increases the chances of touching something containing uranium.

**How does uranium work?**
Uranium dust consists of small or large particles. If someone breathes uranium dust, some is exhaled. Large particles are caught in the nose, sinus areas, and the upper part of your lungs, where they are blown out or swallowed. The small particles are inhaled down to the lower part of your lungs. If they do not dissolve easily, they stay there for years, causing the largest dose of radiation to the lungs. If the particles dissolve easily, they quickly enter the blood, which carries it throughout the body. Although most uranium leaves in the urine within a few days, some stays in the kidneys and bones.

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When someone eats or drinks something with uranium in it, most of the uranium leaves within a few days in waste matter. A small amount of uranium will enter your blood, but it will leave your body in your urine in a few days. Any remaining uranium left stays in your bones, kidneys, or other soft tissues. Most people have very small amounts of uranium in their bodies.

Even though uranium is radioactive, most of the radiation it gives off cannot travel far. For example, uranium in the soil cannot go through the skin into the body. Exposure occurs when someone eats, drinks, or breathes uranium; or gets it on the skin.

**How can uranium affect my health?**
Uranium is a radioactive chemical. Low levels of radiation from uranium have not been found to be harmful, but its chemical effects are harmful. Some people showed signs of kidney disease after taking in large amounts of uranium. Kidney disease was also found in animals treated with large amounts of uranium. It is unlikely to get cancer from low levels of radiation from uranium. There is a greater chance of getting cancer if a person is exposed to a form of uranium called enriched uranium. Enriched uranium is more radioactive than natural uranium, and therefore more dangerous.

Cancer may not become apparent until many years after a person is exposed to a radioactive material from swallowing or breathing it. A kind of bone cancer called a sarcoma occurred in some people who often eat food or drink water containing higher levels of uranium. We do not know if exposure to uranium causes reproductive effects in people. In experiments with laboratory animals, very high doses of uranium reduced sperm counts.

**How is uranium poisoning treated?**
Decontamination removes the uranium from areas it contacted. All clothing should be removed, and the patient's entire skin surface should be then scrubbed with soap and water. Clothing, along with soap, wastewater, and towels, should be placed in a sealed container and labeled as radioactive waste. If someone ingests or breathes in uranium, medicine is given to remove the radiation from their bloodstream. Other medicines prevent radiation from entering the tissues or hasten excretion through the urine.

**What should I do if exposed to uranium?**
If you believe you were exposed to uranium, get prompt medical attention. If your doctor confirms that you were exposed to a large amount of uranium, the doctor will determine if family members (particularly children) were also exposed. The doctor could ask the state health department to determine what happened. Decontamination is likely.

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**What factors limit use or exposure to uranium?**
Above average levels of uranium may be in the soil at hazardous waste sites. Persons living near such sites should not let children eat dirt, and children should wash their hands regularly. Clean all fruits and vegetables well. Discard the outside part of vegetables (such as potato skins) that grow underground in such soil.

**Is there a medical test to show whether I've been exposed to uranium?**
A test can measure the amount of uranium in your urine, blood, and hair. A urine test is the most common test. Uranium leaves the body within a short time. If you think you were exposed to a high level of uranium, get examined by a medical professional immediately. The doctor can get a urine sample soon after exposure. A radioactivity counter can tell if your skin contacted uranium. If you breathe in large amounts of uranium, the amount may be measured with special radiation devices.

**Technical information for uranium**

CAS Number: 7440-61-1

Chemical Formula: U

Carcinogenicity (EPA): There is no assessment at this time.

MCL (Drinking Water): 30 ug/L

OSHA Standards: 0.05 $mg/m^3$ (soluble compounds); 0.25 $mg/m^3$ (insoluble compounds)

NIOSH Standards: 0.05 $mg/m^3$ (soluble compounds); 0.2 $mg/m^3$ (insoluble compounds)

**Resources**

Agency for Toxic Substances and Disease Registry (ATSDR). 2013. *Toxicological profile for Uranium*. Atlanta, GA: U.S. Department of Health and Human Services. https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=440&tid=77

NIOSH Pocket Guide to Chemical Hazards, Uranium, http://www.cdc.gov/niosh/npg/npgd0650.html