

# FAQ: Radon



## Highlights:

Radon is an odorless, radioactive gas formed from the breakdown of uranium. Exposure to high levels results in an increased risk of lung cancer. This chemical has been found in at least 5 of the 1,177 National Priorities List sites identified by the Environmental Protection Agency (EPA).

## What is radon?

Radon is a naturally occurring radioactive gas that is odorless and tasteless. It is formed from the radioactive decay of uranium. Uranium is found in small amounts in most rocks and soil. It slowly breaks down to other products such as radium, which breaks down to radon.

Radon also undergoes radioactive decay. It divides into two parts-one part is called radiation, and the other part is called a daughter. The daughter, like radon, is not stable, and it also divides into radiation and another daughter. The dividing of daughters continues until a stable, nonradioactive daughter is formed. During the decay process, alpha, beta, and gamma radiation are released. Alpha particles can travel only a short distance and cannot travel through your skin. Beta particles can penetrate through your skin, but they cannot go all the way through your body. Gamma radiation can go all the way through your body.

Radon is no longer used in the treatment of various diseases including cancer, arthritis, diabetes, and ulcers. Radon is used to predict earthquakes, in the study of atmospheric transport, and in exploration for petroleum and uranium.

## What happens to radon when it enters the environment?

- Radon enters the environment from the soil, from uranium and phosphate mines, and from coal combustion.
- Radon has a radioactive half-life of about 4 days; this means that one-half of a given amount of radon will decay to other products every 4 days.
- Some of the radon produced in the soil will move to the surface and enter the air.
- Radon daughters attach to dust and other particles in the air.
- Most of the radon will remain in the soil.
- Radon also moves from the soil and enters the groundwater.

## How might I be exposed to radon?

- Radon is found at very low levels in outdoor air.
- It is found at higher levels in indoor air in homes, schools, and office buildings.
- Cracks in the basement or foundation of a home may allow higher levels of radon inside the home.

- Indoor radon levels are affected by the radium and uranium levels in soil, the porosity of the soil, the composition and condition of the foundation materials, and the ventilation rate of the room.
- Miners, particularly those who mine uranium and hard rock, are exposed to higher levels of radon.
- Radon is found in drinking water and may be higher in well water.

### **How can radon affect my health?**

Exposure to high levels of radon may result in an increased incidence of lung diseases, such as emphysema and pulmonary fibrosis. These diseases have been seen at a higher rate than normal among underground miners who were also exposed to arsenic, silica dust, diesel fumes, and cigarette smoke. Lung disease has been reported to increase with increasing exposure to radon and cigarette smoking.

Effects on the lung have also been seen in animals exposed to radon.

### **How likely is radon to cause cancer?**

People exposed to high levels of radon have an increased incidence of lung cancer.

### **Is there a medical test to show whether I've been exposed to radon?**

Radon in human tissues is not detectable by routine medical testing. However, several of its decay products can be detected in urine and in lung and bone tissue. These tests cannot tell how much radon you were exposed to, nor can they be used to predict whether you will develop harmful health effects.

### **Has the federal government made recommendations to protect human health?**

The EPA has set a guideline for radon in air inside homes of 4 picocuries per liter (4 pCi/L) of air.

The EPA has also set a standard of 20 picocuries per square meter per second (20 pCi/m<sup>2</sup>/sec) for emissions of radon-222 (a radon daughter) to the air from uranium mill tailings in non-operational piles.

The federal recommendations have been updated as of July 1999.

### **Glossary**

CAS: Chemical Abstracts Service.

Emphysema: A lung disease.

Millirem (mrem): A unit used to measure radiation dose.

National Priorities List: A list of the nation's worst hazardous waste sites.

Picocurie (pCi): A unit used to measure the quantity of radioactive material.

Pulmonary fibrosis: Formation of fibrous tissue in the lung.

## **References**

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. [Toxicological Profile for radon](#). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

## **Where can I get more information?**

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. For more information, you may call the ATSDR Information Center at 1-888-422-8737.