

Radioactive Contamination and Radiation Exposure

Radioactive contamination and radiation exposure could occur if radioactive materials are released into the environment as the result of an accident, an event in nature, or an act of terrorism. Such a release could expose people and contaminate their surroundings and personal property.

What Radioactive Contamination Is

Radioactive contamination occurs when radioactive material is deposited on or in an object or a person. Radioactive materials released into the environment can cause air, water, surfaces, soil, plants, buildings, people, or animals to become contaminated. A contaminated person has radioactive materials on or inside their body.

What External Contamination Is

External contamination occurs when radioactive material, in the form of dust, powder, or liquid, comes into contact with a person's skin, hair, or clothing. In other words, the contact is external to a person's body. People who are externally contaminated can become internally contaminated if radioactive material gets into their bodies.

What Internal Contamination Is

Internal contamination occurs when people swallow or breathe in radioactive materials, or when radioactive materials enter the body through an open wound or are absorbed through the skin. Some types of radioactive materials stay in the body and are deposited in different body organs. Other types are eliminated from the body in blood, sweat, urine, and feces.

What Radiation Exposure Is

Radioactive materials give off a form of energy that travels in waves or particles. This energy is called radiation. When a person is exposed to radiation, the energy penetrates the body. For example, when a person has an x-ray, he or she is exposed to radiation.

How Contamination Differs from Exposure

A person exposed to radiation is not necessarily contaminated with radioactive material. A person who has been exposed to radiation has had radioactive waves or particles penetrate the body, like having an x-ray. For a person to be contaminated, radioactive material must be on or inside of his or her body. A contaminated person is exposed to radiation released by the radioactive material on or inside the body. An uncontaminated person can be exposed by being too close to radioactive material or a contaminated person, place, or thing.

How Exposure or Contamination Can Happen

Radioactive materials could be released into the environment in the following ways:

- A nuclear power plant accident
- An atomic bomb explosion

- An accidental release from a medical or industrial device
- Nuclear weapons testing
- An intentional release of radioactive material as an act of terrorism

How Radioactive Contamination Is Spread

People who are externally contaminated with radioactive material can contaminate other people or surfaces that they touch. For example, people who have radioactive dust on their clothing may spread the radioactive dust when they sit in chairs or hug other people.

People who are internally contaminated can expose people near them to radiation from the radioactive material inside their bodies. The body fluids (blood, sweat, urine) of an internally contaminated person can contain radioactive materials. Coming in contact with these body fluids can result in contamination and/or exposure.

How Your Home Could Become Contaminated

People who are externally contaminated can spread the contamination by touching surfaces, sitting in a chair, or even walking through a house. Contaminants can easily fall from clothing and contaminate other surfaces. Homes can also become contaminated with radioactive materials in body fluids from internally contaminated people. Making sure that others do not come in contact with body fluids from a contaminated person will help prevent contamination of other people in the household.

How You Can Limit Contamination

Since radiation cannot be seen, smelled, felt, or tasted, people at the site of an incident will not know whether radioactive materials were involved. You can take the following steps to limit your contamination.

- **Get out of the immediate area quickly.** Go inside the nearest safe building or to an area to which you are directed by law enforcement or health officials.
- **Remove the outer layer of your clothing.** If radioactive material is on your clothes, getting it away from you will reduce the external contamination and decrease the risk of internal contamination. It will also reduce the length of time that you are exposed to radiation.
- If possible, **place the clothing in a plastic bag or leave it in an out-of-the way area**, such as the corner of a room. Keep people away from it to reduce their exposure to radiation. Keep cuts and abrasions covered when handling contaminated items to avoid getting radioactive material in them.
- **Wash all of the exposed parts of your body** using lots of soap and lukewarm water to remove contamination. This process is called **decontamination**. Try to avoid spreading contamination to parts of the body that may not be contaminated, such as areas that were clothed.
- After authorities determine that **internal contamination may have occurred**, you may be able to take medication to reduce the radioactive material in your body.

For additional information, visit www.health.pa.gov or www.emergency.cdc.gov.