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# Frequently Asked Questions about a Radiation Emergency

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## What Is Radiation?

- Radiation is a form of energy that is naturally present all around us.
- Different types of radiation exist, some of which have more energy than others.
- Radioactive material is a substance that gives off radiation
- Amounts of radioactive material released into the environment are measured in units called **curies**. However, the dose of radiation that a person receives is measured in units called **rem**.

For more information on radiation measurement, see the CDC fact sheet [Measuring Radiation](#).

For more information about radiation check the following Web sites:

- U.S. Environmental Protection Agency: [Radiation](#)
- Radiation Emergency Assistance Center/Training Site of Oak Ridge Associated Universities: [Radiation Accident Management](#)

## How Can Exposure Occur?

- People are exposed to small amounts of radiation every day, both from naturally occurring sources (such as elements in the soil or cosmic rays from the sun), and man-made sources. Man-made sources include some electronic equipment (such as older television sets), medical sources (such as x-rays, certain diagnostic tests, and treatments), and from nuclear weapons testing.
- The amount of radiation from natural or man-made sources to which people are exposed is usually small; a radiation emergency (such as a nuclear power plant accident or a terrorist event) could expose people to small or large doses of radiation, depending on the severity of the incident.
- Scientists estimate that the average person in the United States receives a dose of about two-thirds of a rem per year. About 50% of human exposure comes from natural sources and the remaining 50% primarily comes from medical radiation exposures.

- Contamination refers to radioactive material that is deposited anywhere that they are not supposed to be, such as on an object or on a person's skin.
- Internal contamination refers to radioactive material that is taken into the body through breathing, eating, drinking, or open wounds.
- Exposure occurs when radiation energy penetrates the body. For example, when a person has an x-ray, he or she is exposed to radiation but they are not radioactive.

For more information on contamination and exposure, see the CDC fact sheet [Radioactive Contamination and Radiation Exposure](#).

## What Happens When People Are Exposed to Radiation?

- Radiation can affect the body in a number of ways, and the adverse health effects of exposure may not be apparent for many years.
- These adverse health effects can range from mild effects, such as skin reddening, to serious effects such as cancer and death, depending on the amount of radiation absorbed by the body (the dose), the type of radiation, the route of exposure, and the length of time a person was exposed.
- Exposure to very large doses of radiation may cause death within a few days or months.
- Exposure to lower doses of radiation may lead to an increased risk of developing cancer or other adverse health effects later in life.

For more information about health effects from radiation exposure, check the following Web sites:

- U.S. Environmental Protection Agency: [Radiation](#)
- Radiation Emergency Assistance Center/Training Site of Oak Ridge Associated Universities: [Radiation Accident Management](#)

## What Types of Emergencies Might Involve Radiation?

- Possible terrorist events could involve introducing radioactive material into the food or water supply, using explosives (like dynamite) to scatter radioactive materials (called a "dirty bomb"), bombing or destroying a nuclear facility, or exploding a small nuclear device.
- Although introducing radioactive material into the food or water supply most likely would cause great concern or fear, it probably would not cause much contamination or increase the danger of adverse health effects.
- Although a dirty bomb could cause serious injuries from the explosion, it most likely would not have enough radioactive material in a form that would cause serious radiation sickness among large numbers of people. However, people who were exposed to radiation scattered by the bomb could have a greater risk of developing cancer later in life, depending on their dose.
- An accident or explosion at a nuclear facility could cause a large amount of radioactive material to be released. People at the facility would probably be contaminated with radioactive material and possibly be injured if there was an explosion. Those people who received a large dose might develop acute radiation syndrome. People in the surrounding area could be exposed or contaminated.
- Clearly, an exploded nuclear bomb could result in a lot of property damage. People would be killed or injured from the blast and contaminated by radioactive material depending on their

distance from the blast. Many people could have symptoms of acute radiation sickness. After a nuclear explosion, radioactive fallout would extend over a large region far from the point of impact, potentially increasing people's risk of developing cancer over time.

For more information about radiation terrorist events, see the CDC Radiation Emergencies website or check with the following organizations:

- Oak Ridge Radiation Emergency Assistance/Training Site
- U.S. National Response Team
- U.S. Department of Energy
- Nuclear Regulatory Commission
- U.S. Environmental Protection Agency

## **What Preparations Can I Make for a Radiation Emergency?**

- Your community should have a plan in place in case of a radiation emergency. Check with community leaders to learn more about the plan and possible evacuation routes.
- Check with your child's school, the nursing home of a family member, and your employer to see what their plans are for dealing with a radiation emergency.
- Develop your own family emergency plan so that every family member knows what to do.
- At home, put together an emergency kit that would be appropriate for any emergency. The kit should include the following items at a minimum:
  - A flashlight with extra batteries
  - A portable radio with extra batteries
  - Bottled water
  - Canned and packaged food
  - A hand-operated can opener
  - A first-aid kit and essential prescription medications
  - Personal items such as paper towels, garbage bags, and toilet paper

For more information about preparing for a radiation emergency event, check the following Web sites:

- Federal Emergency Management Agency
- American Red Cross: Terrorism – Preparing for the Unexpected
- U.S. Environmental Protection Agency's Office of Emergency Management

## **How Can I Protect Myself During a Radiation Emergency?**

- During and after a release of radioactive materials, local, state and federal authorities will monitor the levels of radiation and determine what protective actions to take.

- The most appropriate action will depend on the situation. Tune to the local emergency response network or news station for information and instructions during any emergency.
- If a radiation emergency involves the release of large amounts of radioactive materials, you may be advised to “shelter in place,” which means to stay in your home or office; or you may be advised to move to another location.
- If you are advised to shelter in place, you should do the following:
  - Close and lock all doors and windows.
  - Turn off fans, air conditioners, and forced-air heating units that bring in fresh air from the outside. Only use units that recirculate air that is already in the building.
  - Close fireplace dampers.
  - If possible, bring pets inside.
  - Move to an inner room or basement.
  - Keep your radio tuned to the emergency response network or local news to find out what else you need to do.
- If you are advised to evacuate, follow the directions that your local officials provide. Leave the area as quickly and orderly as possible. In addition –
  - Take a flashlight, portable radio, batteries, first-aid kit, supply of sealed food and water, hand-operated can opener, essential medicines, extra clothes and cash and credit cards.
  - Take pets only if you are using your own vehicle and going to a place you know will accept animals. Emergency vehicles and shelters usually will not accept animals.

For more information about evacuation, see the CDC fact sheet [Facts About Evacuation During a Radiation Emergency](#).

For more information about sheltering, see the CDC fact sheet [Sheltering in Place During a Radiation Emergency](#) or the American Red Cross fact sheet [Shelter-in-Place](#).

For more information about emergency response, check the following Web sites:

- [Federal Emergency Management Agency](#)
- [American Red Cross: Disaster Services](#)
- [U.S. Environmental Protection Agency’s Office of Emergency Management](#)

## **Should I Take Potassium Iodide During a Radiation Emergency?**

- Potassium iodide (KI) should only be taken in a radiation emergency that involves the release of radioactive iodine, such as an accident at a nuclear power plant or the explosion of a nuclear bomb. You should only take KI if you have been instructed to do so by local public health or emergency management officials. A “dirty bomb” most likely will not contain radioactive iodine.
- A person who is internally contaminated with radioactive iodine may experience thyroid disease later in life. The thyroid gland will absorb radioactive iodine and may develop cancer or

abnormal growths later on. KI will saturate the thyroid gland with iodine, decreasing the amount of harmful radioactive iodine that can be absorbed.

- KI only protects the thyroid gland and does not provide protection from any other radiation exposure.
- Some people are allergic to iodine and should not take KI. Check with your doctor about any concerns you have about potassium iodide.

For more information about KI, see the CDC fact sheet Potassium Iodide (KI) or check the following Web sites:

- U.S. Food and Drug Administration: Frequently Asked Questions on Potassium Iodide (KI)
- U.S. Food and Drug Administration: Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergencies