Facts about Radiation

Radiation is a form of energy that is present all around us. Different types of radiation exist, some having more energy than others. Amounts of radiation 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.

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 microwave ovens and 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 situation.

About 80% of human exposure comes from natural sources and the remaining 20% comes from man-made radiation sources - mainly medical x-rays.

Internal exposure refers to radioactive material that is taken into the body through breathing, eating, or drinking. External exposure refers to an exposure to a radioactive source outside of our bodies. Contamination refers to particles of radioactive material that are deposited anywhere they are not supposed to be, such as on an object or on a person's skin.

HOW RADIATION AFFECTS YOUR BODY

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. The effects will depend 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.

TERRORISM AND 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.
- A meltdown 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* (sudden) radiation syndrome. People in the surrounding area could be exposed or contaminated. Clearly, an exploded nuclear device could result in a lot of property damage. People would be killed or injured from the blast and might be contaminated by radioactive material. Many people could have *symptoms* (problems) of acute radiation syndrome. 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.

PREPARATIONS 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:

- 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

HOW TO PROTECT YOURSELF DURING A RADIOLOGIC EMERGENCY

- After a release of radioactive materials, local 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 to 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.
- Take a flashlight, portable radio, batteries, first-aid kit, supply of sealed food and water, hand-operated can opener, essential medicines, 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.

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. A “dirty bomb” most likely will not contain radioactive iodine.
- A person who is internally exposed to 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.

Most of this information is courtesy of US Government CDC. In times of an emergency, much of this material may not apply when it comes to specialized care and testing. These are guidelines to help you when that care is not available. Some of this information is very technical and difficult to understand, but hopefully someone will be available for help in treatment and understanding.

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