



## FACT SHEET

### Sheltering in Place during a Radiation Emergency

The terrorist events of 2001 made many people wonder about the possibility of a terrorist attack involving radioactive materials. People who live near but not in the immediate area of the attack may be asked to stay home and take shelter rather than try to evacuate. This action is called “sheltering in place.” Because many radioactive materials rapidly decay and dissipate, staying in your home for a short time may protect you from exposure to radiation. The walls of your home may block much of the harmful radiation. Taking a few simple precautions can help you reduce your exposure to radiation. The Centers for Disease Control and Prevention has prepared this fact sheet to help you protect yourself and your family and to help you prepare a safe and well-stocked shelter.

#### Preparing a Shelter in Your Home

The safest place in your home during an emergency involving radioactive materials is a centrally located room or basement. This area should have as few windows as possible. The further your shelter is from windows, the safer you will be.

Preparation is the key. Store emergency supplies in this area. An emergency could happen at any time, so it is best to stock supplies in advance and have everything that you need stored in the shelter.

Every 6 months, check the supplies in your shelter. Replace any expired medications, food, or batteries. Also, replace the water in your shelter every 6 months to keep it fresh.

Make sure that all family members know where the shelter is and what it is for. Caution them not to take any items from that area. If someone “borrows” items from your shelter, you may find that important items are missing when they are most needed.

If you have pets, prepare a place for them to relieve themselves in the shelter. Pets should not go outside during a radiation emergency because they may track radioactive materials from fallout into the shelter. Preparing a place for pets will keep the radioactive materials from getting inside the shelter.

#### Preparing Emergency Supplies

Stock up on supplies, just as you would in case of severe weather conditions or other emergencies. Following is a list of things to consider when preparing your emergency kit.

- **Food with a long shelf life**—Examples of this include canned, dried, and packaged food products. Store enough food for each member of the household for at least 3 days.
- **Water**—In preparation for an emergency, purchase and store bottled water or simply store water from the tap. Each person in the household will need about 1 gallon per day; plan on storing enough water for at least 3 days.
- **A change of clothes and shoes**—Check clothing every 6 months and remove clothes that no longer fit or are unsuitable for seasonal weather. Remember to include underwear, socks, sturdy shoes or work boots, and winter or summer clothes as needed.
- **Paper plates, paper towels, and plastic utensils**—Store disposable dishware and utensils because you will not have enough water to wash dishes and because community water sources may be contaminated.

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- **Plastic bags**—Because you may not be able to leave your shelter for several days, you will need to collect your waste in plastic bags until it can be removed.
- **Bedding**—Store sheets, blankets, towels, and cots for use during the time that you cannot leave your shelter.
- **Battery-operated radio and batteries**—Electrical power may not be on for several days. A battery-operated radio will allow you to listen to emergency messages.
- **Medicines**—Have 2-3 days' dose of your current prescription medicines in a childproof bottle for your shelter medical kit; label with the name and expiration date of the medicine. (Discuss with your doctor the best way to obtain this small amount of extra medicine.) Be sure to check medicines in your kit every 6 months to make sure they are not past the expiration date.
- **Toiletries**—Keep a supply of soap, hand sanitizer, toilet paper, deodorant, disinfectants, etc.
- **Flashlight and batteries**—Electrical power may be out for several days. A flashlight will help you see in your shelter.
- **A telephone or cell phone**—Although cell phone or ground phone service may be interrupted, there is still a chance that you will be able to use a phone to call outside for information and advice from emergency services.
- **Extra eyeglasses or contact lenses and cleaning supplies.**
- **Duct tape and heavy plastic sheeting**—You can use these items to seal the door to your shelter and to seal any vents that open into your shelter for a short period of time if a radiation plume is passing over.
- **Pet food, baby formula, diapers, etc.**—Don't forget the other members of your family. If you have an infant, store extra formula and diapers. If you have pets keep a 3-day supply of pet food.
- **First aid kit**—You can purchase a first-aid kit or prepare one yourself. Be sure to include the following items:
  - Sterile adhesive bandages
  - Sterile gauze pads in 2 inch and 4 inch sizes
  - Adhesive tape
  - Sterile rolled bandages
  - Scissors
  - Tweezers
  - Needle
  - Thermometer
  - Moistened towelettes
  - Antiseptic ointment
  - Tube of petroleum jelly or other lubricant
  - Soap or hand sanitizer
  - Latex or vinyl gloves
  - Safety pins
  - Aspirin or aspirin free pain reliever
  - Antidiarrhea medication
  - Laxatives
  - Antacids for stomach upset
  - Syrup of ipecac to cause vomiting if advised by the Poison Control Center
  - Activated charcoal to stop vomiting if advised by the Poison Control Center
- **Games, books, and other entertainment**—Because you may be in your shelter for several days, keep items on hand to occupy your family during that time. Children are likely to get bored if they have to stay in one place for long periods. Think of activities that they will enjoy doing while in the shelter – finger painting, coloring, playing games, etc.

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### Tips before Entering a Shelter

If you are outside when the alert is given, try to remove clothing and shoes and place them in a plastic bag before entering the house. During severe weather, such as extreme cold, remove at least the outer layer of clothes before entering the home to avoid bringing radioactive material into your shelter. Leave clothing and shoes outside. Shower and wash your body with soap and water. Removing clothing can eliminate up to 90% of radioactive contamination (see [www.bt.cdc.gov/radiation/contamination.asp](http://www.bt.cdc.gov/radiation/contamination.asp)). By taking this simple step, you will reduce the time that you are exposed and also your risk of injury from the radiation.

Before entering the shelter, turn off fans, air conditioners, and forced-air heating units that bring air in from the outside. Close and lock all windows and doors, and close fireplace dampers.

When you move to your shelter, use duct tape and plastic sheeting to seal any doors, windows, or vents for a short period of time in case a radiation plume is passing over (listen to your radio for instructions). Within a few hours, you should remove the plastic and duct tape and ventilate the room. Suffocation could occur if you keep the shelter tightly sealed for more than a few hours.

Keep your radio tuned to an emergency response network at all times for updates on the situation. The announcers will provide information about when you may leave your shelter and whether you need to take other emergency measures.

For more information, visit [www.bt.cdc.gov/radiation](http://www.bt.cdc.gov/radiation),  
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).



# Population Monitoring After a Release of Radioactive Material

In recent years, people have expressed concern about the possibility of a terrorist attack involving radioactive materials, possibly through the use of a “dirty bomb” ([www.bt.cdc.gov/radiation/dirtybombs.asp](http://www.bt.cdc.gov/radiation/dirtybombs.asp)), and the harmful effects of radiation from such an event. The Centers for Disease Control and Prevention has prepared this fact sheet to help people understand how public health officials would monitor people following a radiological incident, and how this monitoring could be used to protect people’s health.

### What “population monitoring” is

The term “population monitoring” is made up of immediate monitoring after an incident and long-term monitoring for health effects from the attack.

Within the first hours and days after a radiological attack, people should be monitored with special equipment that is designed to detect radiation. Public health officials will use the information from the monitoring equipment to find out whether people are contaminated ([www.bt.cdc.gov/radiation/contamination.asp](http://www.bt.cdc.gov/radiation/contamination.asp)), either inside their bodies (internal) or outside their bodies (external), with radioactive materials from the attack. Public health officials also will estimate the amount of radiation to which people were exposed, also known as the dose, through a process called dose reconstruction.

In addition, the health of people who were involved in the incident will be monitored over many years to see whether people are having health effects from the attack. These health effects could include effects related to radiation exposure or effects associated with the stress of being involved in an attack.

### Plans for population monitoring

The Department of Health and Human Services (DHHS) has designated the Centers for Disease Control and Prevention (CDC) as the lead agency for population monitoring. The duties of this designation are described in the Nuclear/Radiological Incident Annex of the *National Response Plan* (NRP, [www.dhs.gov/dhspublic/interapp/editorial/editorial\\_0566.xml](http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0566.xml)).

Under the Nuclear/Radiological Incident Annex of the NRP, CDC is responsible for assisting state, local, and tribal governments in monitoring people for external and internal contamination ([www.bt.cdc.gov/radiation/contamination.asp](http://www.bt.cdc.gov/radiation/contamination.asp)). CDC is also responsible for supporting state, local, and tribal governments in decontaminating people who are internally contaminated by providing guidance on giving medicine that can speed up the removal of radioactive material from people’s bodies.

CDC will also help local and state health departments create a registry (list) of people who might have been exposed to radiation from the incident. As part of the work on the registry, CDC will help the local and state health departments determine how much radiation people were exposed to and follow people for as long as necessary to see whether they develop health effects from radiation exposure or from the stress of being involved in an attack.

### What CDC is doing

CDC is conducting studies to find out whether some existing hospital medical equipment can be used to measure the amount of internal contamination in people.

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In addition, CDC is working with other agencies and organizations from around the world to decide on the best practices for monitoring people's health after a terrorist incident involving radioactive materials. In January 2005, CDC held a Population Monitoring Roundtable with representatives from various federal agencies, state and local public health agencies, doctors, private public health organizations, and health professional organizations. All of these organizations will assist CDC in evaluating the best methods and techniques for performing population monitoring and in developing guidance that state and local public health agencies can use to prepare to respond to a nuclear/radiological event.

### More information

For more information about radiation and emergency response, see the CDC Web site at [www.bt.cdc.gov](http://www.bt.cdc.gov) or contact the following organizations:

- **CDC** at 800-CDC-INFO
- **Conference of Radiation Control Program Directors** at [www.crcpd.org](http://www.crcpd.org) or 502-227-4543
- **Environmental Protection Agency (EPA)** at [www.epa.gov/radiation/rert](http://www.epa.gov/radiation/rert)
- **Nuclear Regulatory Commission** at [www.nrc.gov](http://www.nrc.gov) or 301-415-8200
- **Federal Emergency Management Agency (FEMA)** at [www.fema.gov](http://www.fema.gov) or 202-646-4600
- **Radiation Emergency Assistance Center/Training Site** at [www.orau.gov/reacts](http://www.orau.gov/reacts) or 865-576-3131
- **U.S. National Response Team** at [www.nrt.org](http://www.nrt.org)
- **U.S. Department of Energy (DOE)** at [www.energy.gov](http://www.energy.gov) or 1-800-DIAL-DOE

For more information, visit [www.bt.cdc.gov/radiation](http://www.bt.cdc.gov/radiation), or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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### Facts About Evacuation During a Radiation Emergency

In the event of a radiation emergency, such as a nuclear power plant accident or the explosion of a radioactive "dirty bomb" ([www.bt.cdc.gov/radiation/dirtybombs.asp](http://www.bt.cdc.gov/radiation/dirtybombs.asp)), you may need to leave your home or the immediate area (evacuate). Depending on the direction the radioactive cloud or stream (called the plume) is moving from the incident site (the area where the accident or explosion took place), you may have to evacuate or go to an emergency shelter. This fact sheet will help you decide on the best actions to protect yourself and your family.

#### What you should do during a radiation emergency

If an incident occurs that involves radiation, whether accidental or intentional, you should listen for radio or television reports that will tell you if your area should be evacuated. It is important to wait until you are told to evacuate so that you will know which direction the radioactive plume is moving and how to avoid it.

#### What you should do if you are told to take shelter where you are

You may need to take shelter where you are until an evacuation order is given. Stay inside. Close and lock all windows and doors, and close fireplace dampers. Turn off fans, air conditioners, and forced-air heating units that bring air in from the outside. Go to a room in the middle of your home or workplace, or go to the basement, if possible. Your shelter should have as few windows as possible. For more information on sheltering, see the fact sheet, "Sheltering in Place During a Radiation Emergency" ([www.bt.cdc.gov/radiation/shelter.asp](http://www.bt.cdc.gov/radiation/shelter.asp)) from the Centers for Disease Control and Prevention.

#### How to know whether to evacuate

Local police officers, emergency coordinators, or government officials will alert you with radio and television messages if you need to evacuate. Each situation can be different, and local authorities will need to find out which direction the radioactive plume is moving before ordering people to evacuate. Local authorities will tell you when to go to an emergency shelter, where the shelter is located, and in which direction you should travel to avoid the radioactive plume.

#### Why you may be told *not* to evacuate

Some people may be safer staying in place than they would be evacuating. For example, your child in school may be miles away from the incident, and the wind may carry the radioactive plume away from the school. It may be safer for your child to remain at school than to come home to an area where there is a danger of exposure to the radioactive plume.

#### What to do if you're told to evacuate

Act quickly and follow the instructions of local officials and emergency coordinators. Each situation can be different, so local officials will give you special instructions to follow that are particular to the situation. If you have time, turn off the air conditioner, heater, or ventilation system to your house. Close and lock all windows and doors if you have time.

In your car, keep the windows closed and the ventilation system turned off. If you do not have your own transportation, make plans in advance of an emergency with people who can give you a ride. Check with local officials to see what plans are in place to evacuate people who cannot or do not drive.

## Facts About Evacuation During a Radiation Emergency

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### What you should bring to the emergency shelter

Emergency shelters will have most of the supplies that people need. You should bring any medicines that you are taking and a change of clothes. Emergency coordinators will tell you any other supplies you should bring with you.

### What you should do with your pets

If you are concerned about your pets, you should make plans before an emergency for taking them with you. Most emergency shelters will not accept pets (only service animals, such as dogs used by visually impaired people). You should contact friends or relatives in other areas to see if you may bring your pets to their homes in the case of an emergency. See the fact sheet "Pets and Disasters"

(<http://www.fema.gov/library/petsf.shtm>) from the Federal Emergency Management Agency for more information on what to do with pets during an emergency.

### What to do if you live near a nuclear power plant

If you live within 10 miles of a nuclear power plant, learn the emergency warning systems for the power plant. If you do not know how the power plant has planned to alert your community, contact the utility company that operates the power plant. The utility company is required by law to have plans in place for contacting people in the community during an emergency. The utility company also must inform the community each year of its evacuation plans and routes.

### Where you can get more information about evacuation

For more information about radiation and emergency response, see the CDC Web site at [www.bt.cdc.gov](http://www.bt.cdc.gov) or contact the following organizations:

You can contact one of the following:

- State and local health departments
- Federal Emergency Management Agency ([www.fema.gov](http://www.fema.gov))
- American Red Cross ([www.redcross.org](http://www.redcross.org))
- Centers for Disease Control and Prevention
  - Public Response Hotline (CDC)
    - 800-CDC-INFO
    - 888-232-6348 (TTY)
  - Emergency Preparedness and Response Web site ([www.bt.cdc.gov](http://www.bt.cdc.gov))
  - E-mail inquiries: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov)
  - Mail inquiries:  
Public Inquire c/o BPRP  
Bioterrorism Preparedness and Response Planning  
Centers for Disease Control and Prevention  
Mailstop C-18  
1600 Clifton Road  
Atlanta, GA 30333

For more information, visit [www.bt.cdc.gov/radiation](http://www.bt.cdc.gov/radiation), or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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