

Disasters

Prepare and Respond



Part 4 What to do when disaster strikes

Each type of disaster calls for a targeted response. This section offers brief guidance on what to do if a hurricane, tornado or other disaster is predicted. In each case, recommendations have been limited to a single two-sided page to ease photocopying and distribution to the parish or community.

Winter weather

Snowfall and extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. The impacts include flooding, storm surge, closed highways, blocked roads, downed power lines and hypothermia victims. Protect the household from the many hazards of winter by planning ahead.



When a winter storm threatens

Prepare to survive without power or outside assistance for at least three days. Assemble a survival kit (see Part 3, page 4) and add winter-specific items such as rock salt to melt ice on walkways, sand to improve traction, snow shovels and other snow removal equipment. Include several days' worth of medicines, drinking water and foods that require no cooking or refrigeration.

Protect the household from the many hazards of winter by planning ahead.

Terms used by weather forecasters

Frost/freeze warning – Below freezing temperatures are expected.

Freezing rain – Rain that freezes when it hits the ground, creating a coating of ice on roads, walkways, trees and power lines.

Sleet – Rain that turns to ice pellets before reaching the ground. Sleet also causes roads to freeze and become slippery.

Winter storm watch – A winter storm is possible in the area.

Winter storm warning – A winter storm is occurring or will soon occur in the area.

Blizzard warning – Sustained winds or frequent gusts to 35 mph or greater and considerable falling or blowing snow – reducing visibility to less than a quarter mile – are expected to prevail for a period of three hours or longer.

Heat source

Power may be interrupted, and a home's source of heat may not function – even a gas furnace requires electricity to operate the blower.

Arrange for emergency heating equipment and fuel, such as a gas fireplace or a wood-burning stove, to keep at least one room of a residence livable.

Keep fire extinguishers on hand, and make sure household members know how to use them. Never burn charcoal indoors.

If a kerosene heater is used, refuel it outdoors, station it indoors at least three feet from flammable objects and maintain ventilation to avoid buildup of toxic fumes.

Winterize a home in advance to extend the life of any emergency fuel supply. Insulate walls and attics; caulk and weather-strip doors and windows; and install storm windows or cover windows with plastic.

Watch for signs of hypothermia

If a loved one experiences uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness or apparent exhaustion, move him or her to a warm, dry location, warm the center of the body first and give warm, non-alcoholic beverages if the victim is conscious. Get medical help as soon as possible.

Winter driving

About 70 percent of winter deaths related to snow and ice occur in automobiles. Consider public transportation if travel is necessary. If traveling by car, stay on main roads, travel during daylight hours and don't travel alone. Inform others of the planned itinerary, and check in regularly.



Winterize each vehicle. Check the battery, antifreeze, wipers and washer fluid, ignition system, thermostat, lights and hazard lights, exhaust system, heater, brakes, defroster, oil level and tires. Keep the gas tank full or nearly so throughout the winter.

A “winter car kit” stored in the vehicle should include a shovel, windshield scraper, battery-powered radio, flashlight with extra batteries, water, snacks, mittens, hat, blanket, tow chain or rope, tire chains, bag of road salt and sand, fluorescent distress flag, booster cables, road maps, emergency flares and a cell phone or two-way radio.

If traveling by car, stay on main roads, travel during daylight hours and don't travel alone.

If the vehicle becomes trapped ...

- Turn on hazard lights and hang a distress flag from the antenna or window. *Remain in the vehicle.* Remember that distances can be distorted by blowing snow, and what seems to be a nearby building may be too far to walk in deep or blowing snow.
- Run the engine and heater about ten minutes each hour to keep warm, opening a window slightly for ventilation to guard against possible carbon monoxide poisoning.
- Clear snow from the exhaust pipe periodically.
- Move around to maintain body heat, but avoid overexertion.
- Huddle with passengers and use any available loose materials to insulate from the cold.
- Drink water for good hydration and only sleep if a passenger is present with whom sleep and wake cycles may be alternated to watch for rescue.
- If the car battery is strong, turning on the interior light at night will help rescuers locate the vehicle.

Extreme heat

A prolonged period of excessive heat, often combined with excessive humidity, is called a *heat wave*. The *heat index* is a number in degrees Fahrenheit that tells how hot it feels when relative humidity is added to the air temperature. Exposure to full sunshine can increase the heat index by 15 degrees.

Heat kills by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature.

Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures, known as the "urban heat island effect."

Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. The elderly, young children and those who are ill or overweight are more likely to succumb to extreme heat.



Heat-induced illness

Sunburn – Skin redness and pain, possible swelling, blisters, fever, headaches. *First Aid:* Take a shower, using soap, to remove oils that may block pores and prevent the body from cooling naturally. If blisters occur, apply dry, sterile dressings and get medical attention.

Heat cramps – Muscular pains and spasms, usually in leg and abdominal muscles, often accompanied by heavy sweating. *First Aid:* Get the victim to a cooler location. Lightly stretch and gently massage affected muscles to relieve spasm. Give sips of up to a half-glass of cool water every 15 minutes. Do not give liquids with caffeine or alcohol. If victim complains of nausea, discontinue liquids.

Heat exhaustion – Heavy sweating, though skin may be cool, pale or flushed; weak pulse; normal body temperature is possible but temperature will likely rise. Fainting or dizziness, nausea or vomiting, exhaustion and headaches are possible. *First Aid:* Get victim to lie down in a cool place and fan him or her. Loosen or remove clothing. Apply cool, wet cloths. Give slow sips of water if victim is conscious – no more than a half-glass every 15 minutes. If nausea occurs, discontinue. If vomiting occurs, seek immediate medical attention.

Heat stroke – Also called sunstroke, heat stroke is life threatening and occurs when the victim's temperature-control system stops working. Body temperature can rise to 105 or more, and brain damage and death may result if the body is not cooled quickly. The skin will be hot, red and dry; the pulse will be rapid but weak; and breathing is likely to be fast but shallow. The victim may lose consciousness. *First Aid:* Heat stroke is a severe medical emergency. Call 911 or get the victim to a hospital immediately. Delay can be fatal.

Combating heat effects

- **Stay indoors** as much as possible. If air conditioning is not available, stay on the lowest floor out of the sunshine and use a circulating or box fan to stir the air. Cover windows that receive morning or afternoon sun with drapes, shades, awnings or louvers. Outdoor awnings or louvers can reduce the heat that enters a home by up to 80 percent. Temporary reflectors, such as aluminum foil-covered cardboard, will reflect heat back outside during brief periods of extreme heat. Consider keeping storm windows up all year, and weather-strip doors and sills to keep cool air in.

- **Use a sunscreen lotion** with a sun protection factor of 30 or greater if being outside is unavoidable. Sunburn slows the skin's ability to cool itself.

- **Dress in loose-fitting clothes** that cover as much skin as possible. Lightweight, light-colored clothing reflects heat and sunlight and helps maintain normal body temperature. Protect the face and head by wearing a wide-brimmed hat.

- **Eat a well-balanced diet** of light and regular meals. Avoid using salt tablets unless directed to do so by a physician.

- **Drink plenty of water** for good hydration, even if thirst isn't present. This is particularly true on days when temperatures reach 90° F and higher. Limit intake of alcoholic beverages; they cause dehydration. Children 12 months and older should be reminded to drink water throughout the day and more on hot days. Healthy infants normally do not need extra water until they are receiving solid foods – check with the pediatrician.

- **Consult a doctor** before increasing liquid intake if medical conditions exist such as epilepsy or heart, kidney or liver disease, or if a fluid-restrictive diet or fluid retention is a consideration.

- **Avoid strenuous work** during the warmest part of the day. Use a buddy system when working in extreme heat, and take frequent breaks.

- **Spend at least two hours per day** in an air-conditioned place. If the home is not air conditioned, consider spending the warmest part of the day in a public building such as a library, movie theater, shopping mall or other community facility.

- **Never leave children** or pets alone in closed vehicles.

- **Check on family**, friends and neighbors who do not have air conditioning and who spend much of their time alone.

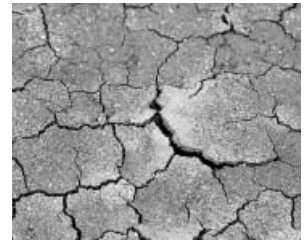
Drought or water shortage

An emergency water shortage can be caused by prolonged drought, poor water supply management or contamination of a surface water supply source or aquifer. The contamination of ground water or an aquifer also may disrupt the use of well water.

A drought is a period of abnormally dry weather that persists long enough to produce serious effects including crop damage and water shortages.

Drought is a silent but very damaging phenomenon that is rarely lethal but enormously destructive. It can ruin local and regional economies that are agricultural and tourism based, and it creates environmental conditions that increase risk of other hazards such as fire, flash flood and landslides.

During water-shortage emergencies, action is important at all levels of society. Individuals can practice water-saving measures to reduce consumption. Cities and towns can ration water. Farmers can change irrigation practices or plant crops that use less water. Factories can alter manufacturing methods.



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Water conservation

- **Never pour water down the drain** when there may be another use for it, such as watering indoor plants or a garden. Don't let the water run while dishwashing, tooth-brushing or shaving.
- **Repair dripping faucets** by replacing washers. One drop per second wastes 2,700 gallons of water per year.
- **Consider purchasing a low-volume toilet** that uses less water, or install a toilet displacement device to cut down on the amount of water needed to flush.
- **Replace showerheads** with low-flow versions. Further reduce use by turning on the water to get wet, turning it off to soap and turning it on again to rinse. Catch rinse water by placing a bucket in the shower, and then use the water for houseplants. Do not take baths; they use far more water than showers.
- **Hand wash dishes** by filling two containers—one with soapy water and the other with rinse water containing a small amount of chlorine bleach.
- **Operate automatic dishwashers** and clothes washers only when they are fully loaded. Use reduced-water settings where possible. Most newer dishwashers clean soiled dishes very well; do not rinse dishes before loading them. Also, front-loading clothes washers typically use far less water than top-loading ones.
- **Store drinking water** in the refrigerator. Don't let the tap run while waiting for water to become hot. To get warm water, heat it on the stove or in a microwave oven.
- **Do not use running water** to thaw meat or other frozen foods. Defrost food overnight in the refrigerator, or use the microwave oven's defrost setting.
- **Clean produce** in a pan filled with water rather than running water from the tap.
- **Kitchen sink disposals** require a lot of water to operate properly. Start a compost pile

as an alternate method of disposing of food waste, or wrap and place in the garbage.

- **If a well is onsite**, check the pump periodically. If the automatic pump turns on and off while water is not being used, there is a leak.

- **Use a shut-off nozzle** on outdoor hoses to reduce water flow while washing a vehicle or manually watering outdoor plants. Park on the grass when washing a vehicle so the lawn will make use of runoff, or consider using a commercial car wash that recycles water.

- **A heavy rain** eliminates the need to water a lawn for up to two weeks. Most of the year, lawns only need one inch of water per week. Position sprinklers so water lands on the lawn and shrubs and not on paved areas. Avoid sprinklers that spray a fine mist, which can evaporate before it reaches plants. Do not leave sprinklers or hoses unattended. A garden hose can pour out hundreds of gallons in only a few hours.

- **Raise the lawn mower blade** to three inches or to its highest level. A higher cut encourages grass roots to grow deeper, shades the root system and holds soil moisture. Plant native or drought-resistant grasses and landscape plants, and use fertilizers that contain slow-release, water-insoluble forms of nitrogen. Over-fertilizing increases the need for water.

- **Use mulch** to retain moisture in the soil and to control weeds that compete with landscape plants for water.

- **Use a broom or blower** instead of a hose to clean leaves and other debris from the driveway or sidewalk.

- **Cover a swimming pool** when not in use to reduce evaporation. Consider installing a new water-saving filter. A single back flushing with a traditional filter uses as much as 250 gallons of water.

- **Participate in water conservation** programs of the local government, utility or water management district. Follow water conservation and water shortage rules in effect. Even if water comes from a private well, these rules apply. Support community efforts that help develop and promote a water conservation ethic. Contact the local water authority, utility district, or local emergency management agency for information specific to the area.

Hurricane

A hurricane is an intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher.

They form and cause the greatest damage in the Atlantic and Gulf Coast areas from June through November, although the stronger ones can sustain strong winds and heavy rain as they travel over land into the northern regions.

Hurricanes can spawn tornadoes and microbursts, and flooding and landslides or mud slides are a concern in mountainous regions for several days or more after the storm passes.

When a *watch* is posted, hurricane/tropical storm conditions are possible in the specified area, usually within 36 hours. A *warning* indicates a hurricane or tropical storm is expected in the specified area, usually within 24 hours. These alerts are widely given via broadcast and cable TV, radio and Internet weather sites.



Before a hurricane threatens

- **Create a household hurricane plan**, and arrange with household members to meet at a place away from the residence in the event they become separated. Choose an out-of-town contact for everyone to call to say they are safe.
- **Prepare disaster supply kits** (See Part 3, page 4) to enable family members to survive without public services for at least three days.
- **Consider special needs** of neighbors, such as people who are disabled or those who have limited vision.
- **Ask the local emergency management** office about evacuation plans governing the neighborhood. Learn evacuation routes, determine a destination and how to get there. Plan alternate routes in case the preferred route is inaccessible or overcrowded.
- **Know how to secure the property.** Learn how to shut off utilities and where gas pilots and water mains are located. Clear loose and clogged rain gutters and downspouts. Keep trees and shrubs around buildings trimmed – dead limbs or trees could cause personal injury or property damage. Take photographs or videotapes of belongings and store with insurance documents in a safe place.
- **Check compliance** of roofs with local building codes. Roofs destroyed by hurricanes often were not constructed or retrofitted according to code. Straps or clips can securely fasten a roof to the frame structure and substantially reduce roof damage.
- **Decide where to secure a boat** or recreational vehicle.
- **If the house is in a low-lying area** or near a body of water, consider flood insurance. Know that there is a 30-day waiting period before flood insurance takes effect.

When a watch or warning is issued

- **Listen to newscasts**, and follow the plan that was prepared.
- **Be ready to evacuate.** Fuel vehicles, because service stations may be closed after the storm, or make arrangements for transportation with a friend or relative. Review evacuation routes.

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- **If the family lives in a mobile home** or in a high-rise building and authorities announce an evacuation, grab the disaster kits and leave immediately, following set evacuation routes according to plan.

- **If not required or unable to evacuate**, stay indoors away from windows and glass doors. Secure outer doors, close interior doors and take refuge in a small interior room, closet or hallway, on the floor under a table or another sturdy object. In a two-story residence, go to an interior first-floor room, such as a bathroom or closet. In a building with more than two floors, go to the first or second floors and stay in interior rooms away from windows. Keep curtains and blinds closed. A lull in the storm may be the hurricane's "eye." After it passes, winds will rise again.

- **Turn off propane tanks.** Turn off utilities if told to do so by authorities. If not instructed to turn off utilities, turn the refrigerator to its coldest setting and keep it closed, in case power is interrupted.

- **Avoid using the phone** except for emergencies. Local authorities need first priority on telephone lines.

After a hurricane

- **If in a secure location** or evacuated, stay there until local authorities say it is safe to return home. Tune to local radio or television stations for this information and for information about caring for household members, where to find medical help, how to apply for

financial assistance and other storm-related topics.

- **Drive only when necessary.** Streets will be filled with debris, and some may have weakened and could collapse. Do not drive on flooded or barricaded roads or bridges. Remember that as little as six inches of water may cause loss of control of a vehicle, and two feet of water will carry most cars away.

- **Stay away from moving water**, riverbanks and streams until any danger of flooding has passed. (See "Flood" on next page).

- **Stay away from downed** power lines, and report them to the power company. Standing water may be electrically charged. Report broken gas, sewer or water mains to local officials.

- **Do not drink tap water** or use it to prepare food until notified by officials that it is safe to do so.

- **Don't use candles or other open flames indoors**; gas lines may have been compromised. Use a flashlight to inspect property damage.

- **Consider family members' health** and safety needs. Be aware of symptoms of stress and fatigue.

- **Contact the insurance agent.** An adjuster will be assigned to visit the residence. Make photos or videotapes of belongings and the structure, then separate damaged from undamaged goods. Set up a manageable schedule to repair property. Keep receipts and records of cleanup costs for later reimbursement by the insurance company.

Flood

Floods are one of the most common hazards in the United States. River floods develop slowly, sometimes over days. Flash floods can develop in a few minutes, sometimes without any sign of rain. The first sign of a flash flood may be a dangerous wall of roaring water carrying rocks, mud and other debris. Flooding from a dam break can produce effects similar to flash floods.



If a building is in a low-lying area, near a body of water or downstream from a dam, it is particularly susceptible to flooding. However, culverts, dry streambeds, low-lying ground, small streams, gullies or creeks that appear harmless in dry weather still can flood.

Terms to know

Flood Watch – Stay tuned to NOAA Weather Radio or commercial radio or television for information. Watches are issued 12 to 36 hours in advance of a possible flooding event.

Flash Flood Watch – Be prepared to move to higher ground, because a flash flood could occur at any time.

Flood Warning – Flooding is occurring or will occur soon. If advised to evacuate, do so immediately.

Flash Flood Warning – A flash flood is occurring. Seek higher ground on foot immediately.

What to do before a flood

- **Identify dams** and determine whether they pose a hazard.
- **Purchase a NOAA Weather Radio** with battery backup. In some areas, a tone-alert automatically signals a watch or warning.
- **Be prepared to evacuate.** Learn evacuation routes and scout for nearby high ground.
- **Plan a place to meet** household members if separated from one another. Choose an out-of-town contact everyone can call to check in.
- **Determine any special needs** neighbors might have, and plan how to assist.
- **Prepare a disaster kit** that will enable survival for at least three days. (See Part 3, page 4.)
- **Know how to shut off** electricity, gas and water at main switches and valves. Know where gas pilot lights are located and how the heating system works.
- **Consider purchasing flood insurance**, which is available in most communities through insurance agents. Be aware of a 30-day waiting period before most flood insurance goes into effect.
- **Make a record of personal property.** Make photographs or videotapes of belongings, and store them with property and insurance documents in a safe place in waterproof containers, preferably off-site.
- **Elevate furnace, water heater and electric panel** to higher floors or the attic if the house is susceptible to flooding. Install “check valves” in sewer traps to prevent flood water from backing up into the drains. Seal walls in basements with waterproofing compounds.

- **Construct barriers** around the property such as levees, berms and floodwalls to stop floodwaters from entering the buildings.

When a flood occurs

- **Listen to radio or television stations** for local information and orders to evacuate.
- **Secure the house.** Tie down or bring outdoor equipment and lawn furniture inside.

Move valuable items to upper floors.

- **If instructed, turn off utilities** at the main switches or valves. Disconnect electrical appliances. Do not touch electrical equipment if wet or standing in water.

- **Sterilize bathtubs** with a diluted bleach solution and fill with water in case tap water becomes contaminated or service is interrupted.

- **Do not walk through moving water** – six inches of moving water can knock a person off his or her feet. If walking in a flooded area is unavoidable, walk where the water is still, and use a stick to check for hidden hazards and firm ground ahead of each step.

- **Do not drive into flooded areas.** Six inches of water can cause loss of control and/or engine stall. A foot of water will float many vehicles. Two feet of water will wash away almost all vehicles. If floodwaters rise around the car, abandon it and move to higher ground.

Avoid standing water, which may be contaminated, electrically charged, or contain hidden hazards.



After a flood

- **Avoid standing water**, which may be contaminated by oil, gasoline or raw sewage; may be electrically charged from underground or downed power lines; or may contain snakes or hidden hazards.

- **Roads may have weakened** and could collapse under the weight of a car in areas where floodwaters have receded.

- **Report downed power lines** and broken gas, sewer or water mains.

- **Stay away from designated disaster areas** unless authorities ask for volunteers.

- **Return home only** when authorities indicate it is safe. Stay out of buildings that are surrounded by floodwaters, because there may be hidden damage, particularly in foundations.

- **Wash frequently with soap** and clean water if in contact with floodwaters, and throw away food that has come in contact with floodwaters.

- **Listen for news reports** to learn whether the community's water supply is safe to drink and for information about where to get assistance for housing, clothing and food.

- **Service damaged septic tanks**, pits and leaching systems as soon as possible. Damaged sewage systems are serious health hazards.

- **Contact the insurance agent.** Take photos or videos of belongings and the house, then separate damaged and undamaged belongings. Keep detailed records of cleanup costs, and keep financial records handy.

Tornado

Tornadoes have been reported in every state. They can occur at any time, though spring and summer have higher frequency. A funnel cloud of wind swirling at 200 miles an hour or more can destroy anything in its path. Though warning systems have improved, it's best to prepare when the skies are clear so that quick reaction is possible.

A tornado watch is issued when conditions are favorable for a tornado to develop. Stay tuned to local news stations for more information. If a tornado warning is issued, a tornado has been sighted in the area; take shelter right away.

Tornado danger signs include a dark, often greenish sky; large hail; a massive, dark, low-lying cloud (particularly if rotation is visible) – and if a loud roar similar to the sound of a freight train is heard, take shelter immediately!



If a tornado warning is issued, a tornado has been sighted in the area; take shelter right away.

If indoors

- **Go to a pre-designated shelter area** such as a safe room, basement, storm cellar or the lowest building level. If there is no basement, go to the center of an interior room, closet or hall on the lowest level away from corners, windows, doors and outside walls. Put as many walls as possible between family members and the outdoors.

- **Avoid sheltering under wide-span roofs**, such as auditoriums, theaters, gymnasiums, cafeterias or shopping malls.

- **A sturdy table** will give additional protection; crawl underneath, then cross arms above the head and neck to protect them.

- **Stay away from metal pipes**, sinks, shower or bathtub, and stay off the toilet.

- **Unplug all major appliances**, and do not use a corded telephone or a computer.

If in a vehicle or mobile home

- **Get out immediately** and go to the lowest floor of a sturdy, nearby building or a storm shelter. Never try to out-drive a tornado!

- **If there isn't time to go indoors**, leave the vehicle and lie flat in a ditch, culvert or low-lying area away from the vehicle, but be aware of the potential for flooding. Cross arms above the head and neck to protect them.

If outdoors

- **Hurry to the lowest floor** of a sturdy, nearby building or lie flat in a ditch, culvert or low-lying area, but be aware of the potential for flooding. Cross arms above the head and neck to protect them.

- **Do not take shelter under an overpass**, bridge, open carport or tree, and avoid

leaning against metal structures or vehicles.

- **Avoid the tallest structure** in the area. Watch out for flying debris.

After a tornado passes



- **Stay away from damaged areas.** Be alert for fallen power lines, which may still be live.
 - **Listen to the radio** for information and instructions.
 - **Assist injured or trapped individuals.** Call for help and give first aid, if appropriate.
 - **Return home** only after authorities say it's safe. If power is out, use a flashlight to inspect the house. For insurance purposes, take pictures of damage to the house and its contents.
- **Do not use candles** at any time, because gas lines may ignite. If the smell of gas is in the air, don't turn on any appliances or switches and leave the building.
 - **Clean up** spilled medicines, bleaches, gasoline or other flammable liquids immediately.

Earthquake

An earthquake is a phenomenon that is powered by the sudden release of stored energy from the earth, which radiates seismic waves. At the surface, earthquakes may manifest in shaking or displacement of the ground. Earthquakes may occur naturally or as a result of human activities. In its most generic sense, the word “earthquake” is used to describe any seismic event.



According to the U.S. Geological Survey (www.usgs.gov), the three most active seismic zones in the southeastern United States are New Madrid, centered over West Tennessee; an area just off the South Carolina coastline; and the southern Appalachian Mountains along the Tennessee-North Carolina border.

While tremors in the Southeast have not usually been at a level that causes catastrophic damage, the region’s seismic potential argues for hazard awareness.

Household preparedness

- **Assemble and maintain disaster kits** that will help members of the household to survive at least three days. (see Part 3, page 4, for a discussion of “ready-to-go” kits.)
- **Fasten shelves**, mirrors and large picture frames securely to walls.
- **Place large** or heavy objects on lower shelves.
- **Brace high** and top-heavy objects.
- **Store bottled foods**, glass, china and other breakables on low shelves or in cabinets that fasten shut.

Construction issues

Whether building or renovating, keep in mind a few common-sense tremor-proofing guidelines, such as firmly anchoring the building to its foundation and installing flexible pipe fittings to prevent gas or water leaks. Plan to bolt down and secure to studs heavy appliances including the water heater, refrigerator, furnace and any gas appliances.

During an earthquake

- **Drop, cover, and hold on.** Minimize movements and stay put until the shaking has stopped.
- **Indoors, take cover** under a sturdy desk, table or bench or against an inside wall or corner. Instruct household members to protect their eyes by pressing their faces against their arms.
- **Stay away from glass**, windows, outside doors and walls, and anything that could fall (such as lighting fixtures) or tall furniture (such as shelving units).
- **If in bed** and the ceiling above is clear of heavy light fixtures, stay there and use a pillow as additional head protection.
- **Do not use an elevator** to get to a safer level.
- **Use a doorway for shelter** only if it is in close proximity and if it is a well-supported,

load-bearing frame.

- **Place home fire extinguishers** near potential fire sources and know how to use them.

Recharge them as necessary.

- **If outdoors**, move away from buildings, streetlights, trees, overpasses and utility wires.
- **If in a moving vehicle**, stop in an open area as quickly as safety permits and stay in the vehicle.

After an earthquake

- **Check for injuries**, and administer first aid as needed.



- **Open cabinets cautiously**, as contents may have shifted and could fall.

- **Look for small fires**, and extinguish them.
 - **Turn off gas supply lines** if the smell of gas is present.
 - **Be prepared for aftershocks**. Secondary shockwaves are usually less violent than the main quake but can be strong enough to further damage weakened structures.

- **If trapped under debris**, do not light a match, move about or kick up dust. Hold a handkerchief or clothing over nose and mouth. Tap on a pipe or wall to signal rescuers. Use a whistle if one is available. Shout only as a last resort, to avoid inhaling dust.

- **Stay away from damaged areas** unless police, fire or relief organizations specifically request assistance.

- **Listen to the radio** for instructions, and use the telephone only to report life-threatening emergencies.

Fire

- The National Fire Protection Agency has found that the age group most likely to die in house fires are those 75 and older.
- Approximately 2.4 million burn injuries are reported in the United States each year.
- Burns and fires are the leading cause of accidental death in the home for children 14 and under and are second only to motor vehicle crashes in causing accidental deaths.



To protect a residence from fire

- **Place smoke alarms** on every level – outside bedrooms on the ceiling or no more than 12 inches from the ceiling, at the top of open stairways or at the bottom of enclosed stairs and near (but not in) the kitchen. If household members sleep with doors closed, install smoke alarms inside sleeping areas, too. Test smoke alarms once a month, and replace batteries at least once a year. Smoke alarms become less sensitive over time, so replace the units every 10 years.
- **Keep an A-B-C-type fire extinguisher** in the house, and get training from the fire department in how to use it. Consider installing an automatic fire sprinkler system in the house.
- **Clean out storage areas** and don't allow cobwebs, dust and trash to accumulate – including newspapers and magazines.
- **Store flammable liquids** in approved containers in well-ventilated storage areas. Never use gasoline, benzine, naphtha or other flammable liquids indoors. Allow any flammable liquid-soaked rags to air outdoors in a metal container, and after fumes are dispersed, seal the rags in plastic and dispose of them.
- **A chimney** should be at least three feet higher than the roof, insulated and have spark arresters on top. Trim nearby tree branches.
- **Use a fireplace screen.** Dispose of ashes in a metal container outdoors and away from the residence.
- **Never smoke near flammable liquids**, in bed or when drowsy or medicated. Douse lighted tobacco products in water before disposing of them.
- **Store matches** and lighters up high, away from children.
- **Keep open flames** of candles, lanterns and tobacco products away from walls, furniture, drapery and flammable items.
- **Check with the fire department** on the legality of using kerosene heaters. Place heaters at least three feet away from flammable materials, and ensure the floor and nearby walls are properly insulated. Have the units inspected and cleaned annually by a certified specialist. Take kerosene heaters outdoors to refuel them, and be sure they have cooled before moving them. Use only the type of fuel designated for the unit, and follow manufacturer's instructions.
- **All electrical outlets** and junction boxes should have cover plates. Make sure insulation does not touch bare electrical wiring. No wiring should be exposed or run across nails, under rugs, or through high-traffic areas.
- **Inspect extension cords** for frayed or exposed wires or loose plugs, and do not overload

Check with the fire department on the legality of using kerosene heaters.



Once out of a burning building, stay out. Call the fire department from a neighbor's house.

them. Use only UL-approved power strips that have built-in circuit breakers to extend the use of an electrical outlet to more than two appliances.

Plan escape routes

- **Determine ways to escape** from every room, and review them with family members. Together, practice escaping from each room.
- **Make sure windows open easily** and that all security gratings and other anti-theft mechanisms that block outside window entry have a fire-safety feature that permits them to be easily opened from the inside.
- **Sleeping areas on upper floors** should have escape ladders. Learn how to use them and store them near the window at which they would be used.
- **Teach family members to stay low** to the floor, where the air is safer, when escaping from a fire. Select a location outside the house where all household members would meet after escaping from a fire.

During a fire

- **Check closed doors for heat** before opening them. Use the back of a hand to feel the top of the door, the doorknob and the crack between the door and door frame before opening it. Never use the palm of a hand or fingers to test for heat, because burning those areas could impair the ability to climb or crawl to safety.
- **If an exit route is blocked** by smoke, heat or flames, stay in the room with the door closed. If there is a telephone in the room, call the fire department and describe family members' locations, then signal locations with bright-colored cloths at those windows.
- **Smoke and poisonous gases** collect first along the ceiling, so be prepared to crawl; the air will be clearer and cooler near the floor. Close doors as passing through them to delay the spread of the fire.
- **If clothing catches on fire**, stop, drop and roll until the fire is extinguished. Running only makes the fire burn faster.
- **Once out, stay out.** Call the fire department from a neighbor's house.

After a fire

- **Cool and cover any burns** to reduce chance of further injury or infection.
- **If heat is felt or smoke is seen** when entering a damaged building, do not enter.
- **A safe or strong box** can hold intense heat for several hours. Opening one before it cools could endanger the contents.
- **If forced to leave the house** because a building inspector says it is unsafe, ask someone trustworthy to watch the property.

Pandemic

According to the World Health Organization, a pandemic can occur when a new virus appears against which the human population has no immunity, resulting in several, simultaneous epidemics worldwide with enormous numbers of deaths and illnesses.

Given the high level of global traffic, a virus may spread rapidly, leaving little or no time to prepare. Vaccines, antiviral agents and antibiotics to treat secondary infections could be in short supply and unequally distributed. Widespread illness could result in sudden and potentially significant shortages of personnel to provide essential community services. Medical facilities could be overwhelmed.

In the past, new strains of influenza have generated pandemics causing high death rates and great social disruption. Influenza's effect also is relatively prolonged throughout a community when compared to other natural disasters, because outbreaks can reoccur.

During the past few years, the world has faced several threats with pandemic potential, making the occurrence of the next pandemic a matter of time. Well-prepared communities will have plans that include public and private cooperation. Individuals and church communities can do their part by keeping up with the facts as reported through reliable sources such as www.pandemicflu.gov and the Centers for Disease Control and Prevention (www.cdc.gov or the agency's hotline at 1-800-232-4636).



Household preparedness

- **Stock a supply** of water and food. A pandemic may make shopping difficult, or stores' stocks may be reduced. Public utility services may also be interrupted, so water supplies may become limited. Store foods that are nonperishable, require little or no water and minimal preparation.

- **Stay away from areas** where crowds gather and illness will spread easily.
- **If children are in the house**, contact the school nurse, teachers, administrators and parent-teacher organizations to plan home learning activities and exercises in the event schools are closed.

Personal protections

- **Take common-sense steps** to limit the spread of germs. Wash hands frequently with soap and water or a waterless cleanser, and as much as is possible, avoid touching the eyes, nose or mouth.

- **Make good hygiene a habit.** Cover the mouth and nose with a tissue when coughing or sneezing, and dispose of used tissues.

- **Eat a balanced diet**, drink lots of water and go easy on salt, sugar, alcohol and saturated fat.

- **Exercise regularly** and get plenty of rest.

- **If ill, stay at home.** Don't take the chance of communicating your illness to co-workers and others.

- **Avoid close contact** with others who are ill.
- **Get a seasonal flu shot**, which will bolster resistance to illness. Any household member who is over the age of 65 or has a chronic illness, such as diabetes or asthma, also should get a pneumonia shot to prevent secondary infection; these offer protection for five to 10 years.

Pandemic effects on the community

- **Crowds increase the risk of contagion.** Contact the local public health department or area Red Cross chapter for safety rules and advice. Church services, movie showings, concerts and other public gatherings may have to be canceled. Public services could be disrupted: Hospitals and other health-care facilities, banks, stores, restaurants and government offices may curtail service or close temporarily.

Get a flu shot, which will bolster resistance to illness.



As churches prepare, they should consider these and other impacts on their members and make creative arrangements for the needs of their communities. Can services be televised on a public-access station or posted to a web channel? Are members trained to carry on the work of the church via telephone, e-mail and other distance measures if quarantines are set?

- **Ask employers** about how business will continue during a pandemic and how employee leave will be scheduled. Consider ways other than public transportation to get to work, or better yet, work from home. Plan for the possible reduction or loss of income if a place of employment is temporarily closed. Meet with colleagues and list locations of materials and information people will need: insurance, leave policies, work-from-home policies, illness and absentee policies.

- **Locate and list volunteers** who will be available to assist elderly neighbors, single parents of small children or people who lack the resources to get medical help they will need. Identify other information

resources in the community, such as mental and public health hot lines or electronic bulletin boards. Prepare backup plans to care for loved ones who are far away.

- **Educate staff and members** about pandemic effects using current materials from pandemicflu.gov and other reliable sources. Because the type of virus may alter the recommended response, it will be important to access and communicate current information regularly as it becomes available.

Terrorism or civil unrest

Terrorism and acts of civil disobedience use force or violence against people or property in violation of criminal laws in order to intimidate, coerce or seek ransom. Perpetrators use threats to create widespread fear, to try to convince citizens that governments are powerless and to get immediate publicity for their causes.

Acts of terrorism and civil unrest may include assassinations; kidnappings; hijackings; bomb scares and bombings; computer-based or “cyber” attacks; and possibly the use of chemical, biological, nuclear and radiological weapons.

High-risk targets include military and civilian government facilities, airports, large cities, high-profile landmarks, large public gatherings, water and food supplies, utilities and corporate centers. Explosives or chemical and biological agents may be sent via the mail. (See page 25 for information about chemical hazards and page 27 for information on biological hazards.)



Ways to prepare

- **Trust gut instinct.** Be aware of surroundings, and leave if something unidentifiable just does not seem right.
- **Take precautions when traveling.** Be aware of unusual behavior. Do not accept packages from strangers. Do not leave luggage unattended. Promptly report unusual behavior, suspicious or unattended packages and strange devices to the police or security personnel.
- **Learn where emergency exits are located** in buildings that are frequently used. Plan how to get out in the event of an emergency.
- **Be prepared** to do without standard services – electricity, telephone, natural gas, gasoline pumps, cash registers, ATMs and Internet transactions.

If there is an explosion

- **If things are falling,** get under a sturdy table or desk. Leave quickly when items settle, watching for weakened floors and stairways. Do not stop to retrieve personal possessions or make phone calls. Do not use elevators. Be especially watchful of falling debris while exiting.
- **Once out,** move away from sidewalks or streets. They will need to be clear for use by emergency officials or others exiting buildings. Do not stand in front of windows, glass doors or other potentially hazardous areas. Rely on police, fire and other officials for instructions.
- **If trapped in debris,** use a flashlight, a whistle or tap on a pipe or wall to signal rescuers. Avoid unnecessary movement so additional dust isn't kicked up, and cover the nose and mouth with any breathable fabric on hand. Shout only as a last resort, because it can cause inhalation of dangerous amounts of dust.

If trapped in debris, use a flashlight, a whistle or tap on a pipe or wall to signal rescuers.



Hazardous material incident

Many communities have Local Emergency Planning Committees whose responsibilities include collecting information about hazardous materials releases in the community, such as an oil spill, freight train derailment or over-the-road trucking accident. They generally make this information available to the public upon request. They also develop emergency plans to prepare for and respond to such emergencies.



What to do

- **Listen to local radio** or television stations for detailed information and instructions.
- **If outdoors**, stay upstream, uphill and upwind. In general, try to go at least one-half mile (8-10 city blocks) from the danger area. Do not walk into or touch any spilled liquids, airborne mists or condensed solid chemical deposits.
- **If in a motor vehicle**, stop and seek shelter in a permanent building. If a building is not nearby and it is necessary to remain in a car, keep windows and vents closed and shut off the air conditioner and heater.
- **If asked to remain indoors** by public officials, close and lock all exterior doors and windows. Close vents, fireplace dampers and as many interior doors as possible. Seal the room by covering each window, door and vent using plastic sheeting and duct tape. Fill cracks and holes, such as those around pipes. Turn off air conditioners and ventilation systems.
- **In large buildings**, set ventilation systems to 100 percent recirculation so that no outside air is drawn into the building. If this is not possible, ventilation systems should be turned off.
- **Evacuate immediately if asked to do so**, and return home only when authorities say it is safe, opening windows and vents and turning on fans to ventilate the house.
- **If exposed to hazardous materials**, follow decontamination instructions from local authorities, such as a thorough shower or perhaps to stay away from water and follow another procedure. Place exposed clothing and shoes in tightly sealed containers and ask local authorities how to properly dispose of them. Seek medical treatment for unusual symptoms as soon as possible.
- **Find out from local authorities** how to clean up land and property. Report any lingering vapors or other hazards to the local emergency services office.

Listen to local radio or television stations for detailed information and instructions.

Chemical hazard or attack

In a major chemical emergency, a hazardous amount of a chemical is released into the environment. Accidents sometimes result in a fire or explosion, or small animals such as fish or birds may die suddenly, but many times there are no signs of a chemical release.

A chemical attack is the deliberate release of a toxic material that can poison people and the environment.

Household chemical also can cause emergencies and must be handled with care.



What to do

- **To notify the public** of a chemical accident or attack, authorities may sound a siren, or emergency personnel may drive by and give instructions over a loudspeaker. Officials could call or come to the door. Listen carefully to radio or television emergency alert stations, and strictly follow instructions.

- **Define the affected area** or the chemical source as quickly as possible. Then locate the fastest means of protection: Is it possible to leave the area, or would it be better to seek shelter in a nearby building?

- **If the chemical is inside the building**, try to exit without passing through the contaminated area. Cover the mouth and nose with a damp cloth to provide a minimal amount of protection for breathing.

- **If there has been an explosion in the building**, exit as quickly as possible without using an elevator. If the exits are blocked, check for fire and other hazards, then take shelter against a desk or a sturdy table as far away as possible from the location of the explosion or suspected chemical release.

- **If at home**, close all windows and turn off all fans, heating and air conditioning systems. Close fireplace dampers. Go to an above-ground room with the fewest windows and doors.

Physical responses

- **Watery eyes, twitching, stinging skin, choking, difficulty breathing or losing coordination** may be signs that a chemical hazard or attack is occurring. Dizziness, sudden headache, blurred vision or a sore throat are other possible symptoms.

- **If toxic vapors overcome someone** nearby, the first priority is to avoid also becoming a victim.

- **If trained in CPR or first aid** and confident there is no personal danger, check an injured person for the degree of harm. Administer appropriate treatment first for life-threatening injuries, then deal with any chemical burns.

- **If calling for emergency medical care**, tell the dispatcher the location of the emergency and the telephone number. Describe what has happened, how many people are involved

Watery eyes, twitching, stinging skin, choking, difficulty breathing or losing coordination may be signs of a chemical hazard or attack.

and what is being done to help. Stay on the phone until the operator hangs up.

- **To treat someone** who may have been exposed to a hazardous chemical, immediately wash affected areas with soap and water, if possible, but do not scrub the chemical into the skin.

- **If eyes are affected**, clear them with clean water. Cool running water will dilute the chemical fast enough to prevent the injury from getting worse.

- **If clothing is contaminated**, remove it starting from the topmost point. Take care not to touch contaminated clothing to bare skin. Place the clothing in a plastic bag so it cannot contaminate other people or things.

- **Cover any wound very loosely** with a dry, sterile or clean cloth so that the cloth will not stick to the wound. Do not put any medication on the wound.

Household chemical dangers

- **Read and follow directions** printed on containers of household chemicals, paying special attention to any need for gloves, eye protection and ventilation. To prevent poisoning, avoid mixing such products – some combinations, such as ammonia and bleach, can create toxic gases.



If eyes are affected, clear them with running water.

- **Don't use household chemicals** near the open flame of an appliance, pilot light, candle, fireplace, wood-burning stove or tobacco product.

- **Store any chemical product** tightly closed in the original container so that labels alert to possible danger and proper use.

- **Clean up spilled chemicals** immediately and allow fumes in the rags to evaporate outdoors in a safe, shaded place, then wrap the rags in a newspaper, seal them in a plastic bag and place them in a trash receptacle.

- **Keep handy a fire extinguisher** labeled for A, B and C class fires, and know how to use it. Remember that extinguishers must be periodically checked and recharged.

- **Recycle or dispose** of unused chemicals properly. Improper disposal – such as pouring a chemical fluid onto the ground or down a household drain or storm drain – may contaminate the local water supply or harm people who come into contact with the chemical. Local waste

collection facilities may accept pesticides, fertilizers, household cleaners, paint, drain and pool cleaners, antifreeze, motor oil and brake fluid. If there are questions about how to dispose of a chemical, call a local recycling or disposal facility or environmental agency.

- **If a child eats or drinks** a non-food substance, call 911 and follow the dispatcher's instructions, because instructions printed on the container may not provide the best solution.

Biological hazard or attack

A biological attack is the release of germs or other biological substances. Many agents must be inhaled, enter through a cut in the skin or be eaten to make the body ill.

A biological attack may or may not be immediately obvious. The danger may only become known via radio or TV after local health care workers report a worrisome pattern of illness.



What to do

- **If aware that an unknown substance** has been released nearby, get away from the area as quickly as possible, covering mouth and nose with layers of fabric that can filter the air but still allow easy breathing. Wash exposed skin with soap and water, and contact authorities.

- **Watch TV, listen to the radio** or check the Internet for official news as it becomes available. In the event of a biological attack, public health officials may not immediately be able to provide information on what to do.

- **Do not automatically assume** during this time that all symptoms of illness are the result of an attack. Use common sense to determine the cause. Practice good hygiene and cleanliness to avoid spreading germs, and seek medical advice if a loved one becomes ill.

Many agents must be inhaled, enter through a cut in the skin or be eaten to make the body ill.

Suspicious mail

- **If a letter or package arrives** and it seems to present a danger, answer these questions: Did it arrive unexpectedly? Does it bear excess postage? Is the name and/or address dramatically misspelled, and does it lack a return address? Is there an unusual odor? Is the packaging material stained, or does the package show other signs of the contents leaking or having spilled? These clues may suggest a call to local law enforcement to check it out.

- **If a threat is received through the mail**, contact local law enforcement authorities, because sending a communication through the U.S. mail that states a threat is a federal crime. If a letter or package contains a threat along with an undetermined substance, contact the local police, FBI and the public health department. If someone nearby has opened the object and developed physical symptoms, call 911.

Nuclear incident

In many areas, nuclear power plants are the primary sources of potential nuclear incidents. For example, about 30 percent of the Tennessee Valley Authority's power supply comes from its three nuclear plants: Browns Ferry, near Athens, Ala.; Sequoyah, in Soddy-Daisy, Tenn.; and Watts Bar, near Spring City, Tenn.



Although the construction and operation of these and other nuclear facilities are closely monitored and regulated by the Nuclear Regulatory Commission, an accident could result in dangerous levels of radiation that could affect the health and safety of people living nearby.

Local and state governments, federal agencies and the electric utilities have emergency response plans in the event of a nuclear power plant incident. The plans define two “emergency planning zones.” One covers an area within a 10-mile radius, where it is possible that people could be harmed by direct radiation exposure. The second zone covers up to a 50-mile radius from the plant, where radioactive materials could contaminate water supplies, food crops and livestock. If residing within 10 miles of the plant, state or local governments should provide public emergency information annually.

Know the terms

Notification of Unusual Event – A small problem has occurred at the plant. No radiation leak is expected. No action will be necessary.

Alert – A small problem has occurred, and small amounts of radiation could leak inside the plant. No action is required.

Site Area Emergency – Area sirens may be sounded. Listen to the radio or television for safety information.

General Emergency – Radiation could leak outside the plant and off the plant site. The sirens will sound. Tune to a local radio or television station for reports. Be prepared to follow instructions promptly.

Radiation dangers

The potential danger from an accident at a nuclear power plant is exposure to radiation. This exposure could come from the release of radioactive material from the plant into the environment, usually characterized by a plume of radioactive gases and particles which may be deposited on the ground, inhaled and/or ingested. Radiation has a cumulative effect. The longer a person is exposed, the greater the effect. A high exposure can cause serious illness or death.

What to do

If an accident at a nuclear power plant were to release radiation, local authorities would activate warning sirens or another approved alert method and offer instruction through the Emergency Alert System on television and radio stations. People in the area would be warned to take cover immediately, below ground if possible. The thicker the shield from radioactive materials, the less radiation will leak through.

Nuclear blast

A blast is another possible source of a nuclear incident. This is an explosion with intense light and heat, a damaging pressure wave, and widespread radioactive material that can contaminate the air, water and ground surfaces for miles around and cause fires. A nuclear device can range from a weapon carried by an intercontinental missile launched by a hostile nation or terrorist organization, to a small portable unit transported by an individual.

The dispersion of hazard effects will be defined by the following:

Size of the device – A more powerful bomb will produce more distant effects.

Height above ground at detonation – Blasts that occur near the earth's surface create much greater amounts of fallout than blasts that occur at higher altitudes, because the tremendous heat produced from a nuclear blast causes an up-draft of air that forms the familiar mushroom cloud. When a blast occurs near the earth's surface, millions of vaporized dirt particles also are drawn into the cloud. As the heat diminishes, radioactive materials that have vaporized condense on the particles and fall back to Earth as radioactive fallout. The fallout material decays over a long period of time and is the main source of residual nuclear radiation.

Nature of the surface beneath the explosion – Some materials are more likely to become radioactive and airborne than others. Flat areas are more susceptible to blast effects.

Existing meteorological conditions – Wind speed and direction will affect arrival time of fallout; precipitation may wash fallout from the atmosphere. Fallout from a nuclear explosion may be carried by wind currents for hundreds of miles if the right conditions exist. Effects from even a small portable device exploded at ground level can be potentially deadly.



A nuclear device can range from a weapon carried by a missile launched by a hostile nation to a small unit transported by an individual.

Radiation dangers

Nuclear radiation cannot be seen, smelled or otherwise detected by the five human senses. Radiation can only be detected by radiation monitoring devices. Monitoring can project the fallout arrival times, which will be announced through official warning channels. However, any increase in surface build-up of gritty dust and dirt should be a warning for taking protective measures.

In addition to other effects, a nuclear weapon detonated in or above the earth's atmosphere can create an electromagnetic pulse, a high-density electrical field that can seriously damage electronic devices including communication systems, computers, electrical appliances and automobile or aircraft ignition systems. Battery-powered radios with short antennas generally would not be affected.

How to prepare

- **People living near potential targets** may be advised to evacuate if there were a threat of an attack. In general, potential targets include: strategic missile sites and military bases; centers of government; transportation and communication centers; manufacturing, industrial, technology and financial centers; petroleum refineries, electrical power plants and chemical plants; and ports and airfields.

- **Find out from officials** if any public buildings in the community have been designated as fallout shelters. If none have been designated, make a list of potential shelters near home, workplace and school. Tunnels, basements and windowless center areas of middle floors in high-rise buildings are good options.

- **During periods of increased threat**, stock disaster supplies to be adequate for up to two weeks.

- **Keep a battery-powered radio** nearby and listen for specific instructions.

What to do

- **If told to evacuate**, keep car windows and vents closed; re-circulate interior air only.

- **If advised to remain indoors**, turn off the air conditioner, ventilation fans, furnace and other air intakes. Go to a basement or other underground area, if possible. Do not use the telephone unless absolutely necessary.

- **If exposed to nuclear radiation**, remove exposed clothing and seal it in a plastic bag. Take a thorough shower. Seek medical treatment for any unusual symptoms, such as nausea, that may be related to radiation exposure.

- **Keep food in covered containers** or in the refrigerator. Food not previously covered should be washed before being put in containers.

- **If caught outside** and unable to go indoors immediately, take cover behind anything that might offer protection – the denser the better. If no protection is evident, lie flat on the ground, crossing arms above the head, and wait. If the explosion is some distance away, it could take 30 seconds or more for the blast wave to hit.

- **Take shelter as soon as possible**, even if many miles from the attack location; radioactive fallout can be carried by the winds for hundreds of miles. Remember the three protective factors: distance, shielding and time.