

# Extreme Heat (Heat Wave)

**H**eat 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.

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 sick or overweight are more likely to succumb to extreme heat.

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."

## What to do before an extreme heat emergency

1. Know the terms associated with extreme heat:

- **Heat wave**—Prolonged period of excessive heat, often combined with excessive humidity.

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- **Heat index**—A number in degrees Fahrenheit (F) 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 cramps**—Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are often the first signal that the body is having trouble with the heat.

- **Heat exhaustion**—Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim's condition will worsen. Body temperature will keep rising and the victim may suffer heat stroke.

- **Heat stroke**—Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

- **Sun stroke**—Another term for heat stroke.

2. Consider the following preparedness measures when faced with the possibility of extreme heat.

- Install window air conditioners snugly, insulate if necessary.
- Close any floor heat registers nearby and use a circulating or box fan to spread cool air.

- Check air-conditioning ducts for proper insulation.
  - Install temporary reflectors, such as aluminum foil covered cardboard, to reflect heat back outside and be sure to weather-strip doors and sills to keep cool air in.
  - 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. Consider keeping storm windows up all year.
  - 3. See the "Emergency Planning and Disaster Supplies" chapter for more information.
- What to do during extreme heat or a heat wave emergency**
1. Stay indoors as much as possible.
    - If air conditioning is not available, stay on the lowest floor out of the sunshine.
    - Remember that electric fans do not cool, they just blow hot air around.
  2. Eat well-balanced, light and regular meals. Avoid using salt tablets unless directed to do so by a physician.
  3. Drink plenty of water regularly even if you do not feel thirsty.
    - Persons who have epilepsy or heart, kidney, or liver disease, are on fluid-restrictive diets, or have a problem with fluid retention should consult a doctor before increasing liquid intake.
- Conserve electricity during periods of extreme heat. People tend to use a lot more power for air conditioning, which could lead to a power shortage or outage.*
4. Limit intake of alcoholic beverages.
    - Although beer and alcoholic beverages appear to satisfy thirst, they actually cause further body dehydration.
  5. Never leave children or pets alone in closed vehicles.
  6. 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.
  7. Protect face and head by wearing a wide-brimmed hat.
  8. Avoid too much sunshine.
    - Sunburn slows the skin's ability to cool itself. Use a sunscreen lotion with a high SPF (sun protection factor) rating (i.e., 15 or greater).
  9. Avoid strenuous work during the warmest part of the day. Use a buddy system when working in extreme heat and take frequent breaks.
  10. Spend at least two hours per day in an air-conditioned place. If your home is not air conditioned, consider spending the warmest part of the day in public buildings such as libraries, schools, movie theaters, shopping malls and other community facilities.
  11. Check on family, friends, and neighbors who do not have air conditioning and who spend much of their time alone.

## First-aid for heat-induced illnesses

### 1. Sunburn

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

### 2. Heat cramps

- *Symptoms:* Painful spasms, usually in leg and abdominal muscles. Heavy sweating.
- *First Aid:* Get the victim out 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 nauseous, discontinue liquids.

### 3. Heat exhaustion

- *Symptoms:* Heavy sweating and 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. Loosen or remove clothing. Apply cool, wet cloths. Fan or move victim to air-conditioned place. Give sips of water if victim is conscious. Be sure water is consumed slowly. Give half glass of cool water every 15 minutes. If nausea occurs, discontinue. If vomiting occurs, seek immediate medical attention.

### 4. Heat stroke (sun stroke)

- *Symptoms:* High body temperature (105+). Hot, red, dry skin. Rapid, weak pulse; and rapid, shallow breathing. Possible unconsciousness. Victim will likely not sweat unless victim was sweating from recent strenuous activity.
- *First Aid:* Heat stroke is a severe medical emergency. Call 911 or emergency medical services or get the victim to a hospital immediately. Delay can be fatal. Move victim to a cooler environment. Remove clothing. Try a cool bath, sponging or wet sheet to reduce body temperature. Watch for breathing problems. Use extreme caution. Use fans and air conditioners.

## Emergency Water Shortage

**A**n emergency water shortage can be caused by prolonged drought, poor water supply management or contamination of a surface water supply source or aquifer.

A drought is a period of abnormally dry weather that persists long enough to produce serious effects (crop damage, water supply shortages, etc.). The severity of the drought depends upon the degree of moisture deficiency, the duration, and the size of the affected area.

Drought can affect vast territorial regions and large population numbers. In effect, drought is a silent but very damaging phenomenon that is rarely lethal but enormously destructive. Drought can ruin local and regional economies that are agricultural and tourism based. Drought also creates environmental conditions that increase

risk of other hazards such as fire, flash flood, and possible landslides/debris flow.

Poor water quality management can result in the demand for water exceeding the available supply. This can be exacerbated by fluctuations in regional precipitation, excessive water demand, or rapid residential development.

Emergency water shortages can also be caused by contamination of a water supply. A major spill of a petroleum product or hazardous chemical on a major river can force communities to shut down water treatment plants. Although typically more localized, the contamination of ground water or an aquifer can also disrupt the use of well water.

## Water conservation

Conserving water is very important during emergency water shortages. Water saved by one user may be enough to protect the critical needs of others. Irrigation practices can be changed to use less water or crops that use less water can be planted. Cities and towns can ration water, factories can change manufacturing methods, and individuals can practice water-saving measures to reduce consumption. If everyone reduces water use during a drought, more water will be available to share.

### 1. Practice indoor water conservation:

#### *General*

- Never pour water down the drain when there may be another use for it. Use it to water your indoor plants or garden.
- Repair dripping faucets by replacing washers. One drop per second wastes 2,700 gallons of water per year!

#### *Bathroom*

- Check all plumbing for leaks. Have leaks repaired by a plumber.
- Install a toilet displacement device to cut down on the amount of water needed to flush. Place a one-gallon plastic jug of water into the tank to displace toilet flow (do not use a brick, it may dissolve and loose pieces may cause damage to the internal parts). Be sure installation does not interfere with the operating parts.
- Consider purchasing a low-volume toilet that uses less than half the water of older models. NOTE: In many areas, low-volume units are required by law.
- Replace your showerhead with an ultra-low-flow version.
- Do not take baths—take short showers—only turn on water to get wet and lather and then again to rinse off.
- Place a bucket in the shower to catch excess water for watering plants.
- Don't let the water run while brushing your teeth, washing your face or shaving.
- Don't flush the toilet unnecessarily. Dispose of tissues, insects, and other similar waste in the trash rather than the toilet.

#### *Kitchen*

- Operate automatic dishwashers only when they are fully loaded. Use the “light wash” feature if available to use less water.
- Hand wash dishes by filling two containers—one with soapy water and the other with rinse water containing a small amount of chlorine bleach.
- Most dishwashers can clean soiled dishes very well, so dishes do not

have to be rinsed before washing. Just remove large particles of food, and put the soiled dishes in the dishwasher.

- Store drinking water in the refrigerator. Don't let the tap run while you are waiting for water to cool.
- Do not waste water waiting for it to get hot. Capture it for other uses such as plant watering or heat it on the stove or in a microwave.
- Do not use running water to thaw meat or other frozen foods. Defrost food overnight in the refrigerator, or use the defrost setting on your microwave.
- Clean vegetables 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 simply dispose of food in the garbage.

#### *Laundry*

- Operate automatic clothes washers only when they are fully loaded or set the water level for the size of your load.

#### *Long-term indoor water conservation*

- Retrofit all household faucets by installing aerators with flow restrictors.
- Consider installing an instant hot water heater on your sink.
- Insulate your water pipes to reduce heat loss and prevent them from breaking if you have a sudden and unexpected spell of freezing weather.

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- If you are considering installing a new heat pump or air-conditioning system, the new air-to-air models are just as efficient as the water-to-air type and do not waste water.
- Install a water-softening system only when the minerals in the water would damage your pipes. Turn the softener off while on vacation.
- When purchasing a new appliance, choose one that is more energy and water efficient.

#### 2. Practice outdoor water conservation:

##### *General*

- If you have a well at home, check your pump periodically. If the automatic pump turns on and off while water is not being used, you have a leak.

##### *Car washing*

- Use a shut-off nozzle on your hose that can be adjusted down to a fine spray, so that water flows only as needed.

- Consider using a commercial car wash that recycles water. If you wash your own car, park on the grass so that you will be watering it at the same time.

##### *Lawn Care*

- Don't over water your lawn. A heavy rain eliminates the need for watering for up to two weeks. Most of the year, lawns only need one inch of water per week.
- Water in several short sessions rather than one long one in order for your lawn to better absorb moisture.
- Position sprinklers so water lands on the lawn and shrubs and not on paved areas.

- Avoid sprinklers that spray a fine mist. Mist can evaporate before it reaches the lawn. Check sprinkler systems and timing devices regularly to be sure they operate properly.
- Raise the lawn mower blade to at least 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 drought-resistant lawn seed.
- Avoid over-fertilizing your lawn. Applying fertilizer increases the need for water. Apply fertilizers that contain slow-release, water-insoluble forms of nitrogen.
- Use a broom or blower instead of a hose to clean leaves and other debris from your driveway or sidewalk.
- Do not leave sprinklers or hoses unattended. A garden hose can pour out 600 gallons or more in only a few hours.

#### *Pool*

- Consider installing a new water-saving pool filter. A single back flushing with a traditional filter uses 180 to 250 gallons of water.
- Cover pools and spas to reduce evaporation of water.

#### *Long term outdoor conservation*

- Plant native and/or drought-tolerant grasses, ground covers, shrubs and trees. Once established, they do not

need water as frequently and usually will survive a dry period without watering. Small plants require less water to become established. Group plants together based on similar water needs.

- Install irrigation devices that are the most water efficient for each use. Micro and drip irrigation and soaker hoses are examples of efficient devices.
- Use mulch to retain moisture in the soil. Mulch also helps control weeds that compete with landscape plants for water.
- Avoid purchasing recreational water toys that require a constant stream of water.
- Avoid installing ornamental water features (such as fountains) unless they use recycled water.

Participate in public water conservation programs of your local government, utility or water management district. Follow water conservation and water shortage rules in effect. Remember, you are included in the restrictions even if your water comes from a private well. Be sure to support community efforts that help develop and promote a water conservation ethic.

Contact your local water authority, utility district, or local emergency management agency for information specific to your area.