

Beat the Heat

Although Wisconsin and Michigan are better known for cold winters, there are days or weeks during the summer when the heat and humidity are down right uncomfortable. In fact, the dog days of summer can even threaten your health.

Older adults and young children are particularly susceptible to heat stress. When the weather is hot, be sure to check on neighbors who may be without air conditioning. Shopping malls, libraries and community centers can offer temporary relief from the heat.



Keep Your Cool in the Heat

You don't have to compromise your health or comfort to conserve energy and save money on your energy bills. You just have to use energy more efficiently.

- Set your central air conditioning thermostat at 78 degrees or higher.
- Close the curtains and blinds on the west and south sides of your home during the day to block out the sun.
- Turn off all unnecessary lights. Light bulbs generate heat.
- To keep your kitchen cool, use a microwave instead of a stove or oven when preparing meals.
- Avoid opening and closing your refrigerator and freezer as much as possible. Plan ahead and store or remove several items at a time.
- Make sure your dishwasher is completely full before using it during cooler evenings.
- Do your laundry and ironing during cooler evenings as well.
- Use a window fan to help draw hot air out of the house.
- When using a fan or air conditioner, close off unused rooms that don't require cooling.
- Clean or replace the filters on your room air conditioner monthly during summer. If possible, install the air conditioner on the shady side of the house -- it will use 5 percent less energy.
- Keep electrical safety in mind when using electrical appliances!

Heat Stress

Hot weather puts a burden on your body — particularly your heart. If the burden is too great, heat can cause serious illness that can be threatening. The occurrence of heat stress can be dramatically reduced when a few simple precautions are taken.

HEAT STRESS PREVENTION

Heat stress is the burden that hot weather puts on your body, especially your heart. If the burden is too great, heat can cause serious illness and can be life-threatening. While everyone is susceptible, older adults, young children, individuals with chronic illnesses and some house pets are more prone to heat stress. Be sure to check on those at greatest risk during hot weather.

Causes and Symptoms of Heat Stress

Outdoor temperatures exceeding 90 degrees during heat waves can lead to the dangerous health condition called heat stress, which raises the body temperature from its normal 98.6 degrees to 100 degrees or more. Heat stress symptoms include:

- Dizziness
- Nausea
- Drier Skin
- Breathing Problems
- Vomiting
- Rapid
- Heartbeat
- Headaches
- Weakness
- Cramps
- Mental Changes

Individuals who experience these symptoms should consult a doctor. Check on those at greatest risk during hot weather.

Preventing Heat Stress

Heat stress is preventable with a few simple precautions.

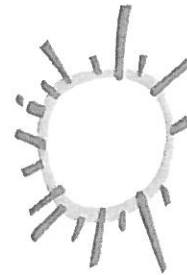
- Slow down and avoid over-exertion that could raise the body's temperature.
- Drink plenty of water, juices and other non-alcoholic and caffeine-free beverages.
- Wear loose-fitting, light-weight, light colored clothing.
- Wear a hat or use an umbrella to protect your head and neck when outdoors.
- Avoid cooking and eating hot foods and heavy meals. Avoid extra salt on your food.
- Use fans and air conditioners. When it is extremely hot, it is better to use the fan as an exhaust to help remove hot air from your home (point the fan out a window to pull out the hot air).
- Visit an air-conditioned public facility, such as a library, shopping mall, movie theatre or restaurant.
- Take a cool shower or bath or visit a public swimming pool. Water cools the body 25 times faster than air.

Conserve Energy and Stay Comfortable

You don't have to compromise your health or comfort to conserve energy and save money on your energy bills.

(Information provided by Wisconsin Energies)

Cool Tips For Hot Days



DO's:

- Check your local forecast daily so you'll be ready for a hot spell.
- Draw all shades, blinds, and curtains in rooms when exposed to direct sunlight.
- Sleep in a cool place.
- Drink 2-4 cups of fluids an hour (no caffeine or alcohol) - even if you don't feel.
- Spend time in air conditioned places (shopping malls, movies, etc.).
- Eat smaller meals.
- Wear loose, light colored "summer" clothing.
- Use fans or air conditioning, to keep air circulating.
- Douse yourself periodically with water, in the tub, shower or with wet towels. Even a cool foot bath helps.
- Stay with someone at all times.
- Check frequently on elderly relatives or neighbors and those taking medications.



DON'Ts

- Engage in strenuous exercise.
- Drink alcoholic beverages, coffee & soda with caffeine (caffeine & alcohol hasten water loss).
- Spend time outside in the sun.
- Sleep or sit in hot conditions.

PRECAUTIONS

Be especially careful if any of the following apply to you:



- Fever
- Elderly
- Overweight
- Heart condition
- Have engaged in exercise
- Drunk alcohol
- Drunk caffeinated beverages
- Taking certain medications

MEDICATION ALERT

Heat-related illnesses are more likely to occur when taking the following drugs:

- Antipsychotics, especially Thorazine, Mellaril, Serentil, Clozaril, Risperdal.
- Antiparkinson drugs, such as Cogentin, Artane, Kemadrin, Akineton.
- Antihistamines, such as Benadryl, Chlortrimeton.
- Antidepressants, especially Tricyclics such as Tofranil, Elavil, Pamelor, Sinequan, Norpramin, Vivactil.
- Thyroid drugs, diabetic medications, heart/blood pressure pills and diuretics.



HEAT-RELATED ILLNESS SYMPTOMS

- Nausea, headache, dizziness, vomiting, fatigue
- Irritability, anxiety
- Fast pulse, rapid breathing, muscle cramps
- Hot or dry skin, confusion, vomiting, diarrhea

HEATSTROKE is a medical emergency when the body's temperature-regulating system breaks down—the victims can't sweat. Internal body temperature often rises as high as 108°, which can cause irreversible brain damage and death.

WHO TO CALL FOR HELP:

Immediately call your medical doctor, the hospital emergency room, or Emergency – 911

*Information taken from:

1. "Beat The Heat" issued in Summer, 1995, by Jon Gudeman, M.D., Medical Director, Milwaukee County Mental Health Complex.

2. "Coping With Hot Weather" article appeared in Milwaukee Journal Sentinel, July 24, 1995.

Racine County Community Health Providers

Extreme Heat: A Prevention Guide to Promote Your Personal Health and Safety

Heat-related deaths and illness are preventable yet annually many people succumb to extreme heat. Historically, from 1979-2003, excessive heat exposure caused 8,015 deaths in the United States. During this period, more people in this country died from extreme heat than from hurricanes, lightning, tornadoes, floods, and earthquakes combined. In 2001, 300 deaths were caused by excessive heat exposure.

People suffer heat-related illness when their bodies are unable to compensate and properly cool themselves. The body normally cools itself by sweating. But under some conditions, sweating just isn't enough. In such cases, a person's body temperature rises rapidly. Very high body temperatures may damage the brain or other vital organs.

Several factors affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly, preventing the body from releasing heat quickly. Other conditions related to risk include age, obesity, fever, dehydration, heart disease, mental illness, poor circulation, sunburn, and prescription drug and alcohol use.

Because heat-related deaths are preventable, people need to be aware of who is at greatest risk and what actions can be taken to prevent a heat-related illness or death. The elderly, the very young, and people with mental illness and chronic diseases are at highest risk. However, even young and healthy individuals can succumb to heat if they participate in strenuous physical activities during hot weather. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned.

Summertime activity, whether on the playing field or the construction site, must be balanced with measures that aid the body's cooling mechanisms and prevent heat-related illness. This pamphlet tells how you can prevent, recognize, and cope with heat-related health problems.

What Is Extreme Heat?

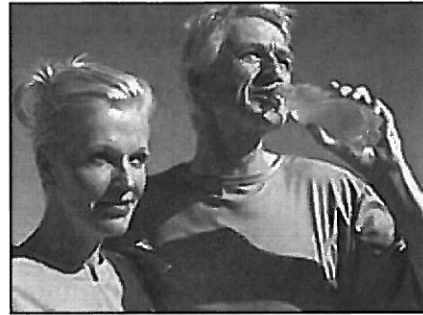
Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a "dome" of high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

During Hot Weather

To protect your health when temperatures are extremely high, remember to keep cool and use common sense. The following tips are important:

Drink Plenty of Fluids

During hot weather you will need to increase your fluid intake, regardless of your activity level. Don't wait until you're thirsty to drink. During heavy exercise in a hot environment, drink two to four glasses (16-32 ounces) of cool fluids each hour.



Warning: If your doctor generally limits the amount of fluid you drink or has you on water pills, ask how much you should drink while the weather is hot.

Don't drink liquids that contain alcohol, or large amounts of sugar—these actually cause you to lose more body fluid. Also avoid very cold drinks, because they can cause stomach cramps.

Replace Salt and Minerals

Heavy sweating removes salt and minerals from the body. These are necessary for your body and must be replaced. If you must exercise, drink two to four glasses of cool, non-alcoholic fluids each hour. A sports beverage can replace the salt and minerals you lose in sweat. However, if you are on a low-salt diet, talk with your doctor before drinking a sports beverage or taking salt tablets.

Wear Appropriate Clothing and Sunscreen

Wear as little clothing as possible when you are at home. Choose lightweight, light-colored, loose-fitting clothing. Sunburn affects your body's ability to cool itself and causes a loss of body fluids. It also causes pain and damages the skin. If you must go outdoors, protect yourself from the sun by wearing a wide-brimmed hat (also keeps you cooler) along with sunglasses, and by putting on sunscreen of SPF 15 or higher (the most effective products say "broad spectrum" or "UVA/UVB protection" on their labels) 30 minutes prior to going out. Continue to reapply it according to the package directions.

Schedule Outdoor Activities Carefully

If you must be outdoors, try to limit your outdoor activity to morning and evening hours. Try to rest often in shady areas so that your body's thermostat will have a chance to recover.



Pace Yourself

If you are not accustomed to working or exercising in a hot environment, start slowly and pick up the pace gradually. If exertion in the heat makes your heart pound and leaves you gasping for breath, STOP all activity. Get into a cool area or at least into the shade, and rest, especially if you become lightheaded, confused, weak, or faint.

Stay Cool Indoors

Stay indoors and, if at all possible, stay in an air-conditioned place. If your home does not have air conditioning, go to the shopping mall or public library—even a few hours spent in air conditioning can help your body stay cooler when you go back into the heat. Call your local health department to see if there are any heat-relief shelters in your area. Electric fans may provide comfort, but when the temperature is in the high 90s, fans will not prevent heat-related illness. Taking a cool shower or bath or moving to an air-conditioned place is a much better way to cool off. Use your stove and oven less to maintain a cooler temperature in your home.

Use a Buddy System

When working in the heat, monitor the condition of your co-workers and have someone do the same for you. Heat-induced illness can cause a person to become confused or lose consciousness. If you are 65 years of age or older, have a friend or relative call to check on you twice a day during a heat wave. If you know someone in this age group, check on them at least twice a day.

Monitor Those at High Risk

Although any one at any time can suffer from heat-related illness, some people are at greater risk than others.

- Infants and children up to four years of age are sensitive to the effects of high temperatures and rely on others to regulate their environments and provide adequate liquids. People 65 years of age or older may not compensate for heat stress efficiently and are less likely to sense and respond to change in temperature.
- People who are overweight may be prone to heat sickness because of their tendency to retain more body heat.
- People who overexert during work or exercise may become dehydrated and susceptible to heat sickness.
- People who are physically ill, especially with heart disease or high blood pressure, or who take certain medications, such as for depression, insomnia, or poor circulation, may be affected by extreme heat.



Visit adults at risk at least twice a day and closely watch them for signs of heat exhaustion or heat stroke. Infants and young children, of course, need much more frequent watching.

Adjust to the Environment

Be aware that any sudden change in temperature, such as an early summer heat wave, will be stressful to your body. You will have a greater tolerance for heat if you limit your physical activity until you become accustomed to the heat. If you travel to a hotter climate, allow several days to become acclimated before attempting any vigorous exercise, and work up to it gradually.

Do Not Leave Children in Cars

Even in cool temperatures, cars can heat up to dangerous temperatures very quickly. Even with the windows cracked open, interior temperatures can rise almost 20 degrees Fahrenheit within the first 10 minutes. Anyone left inside is at risk for serious heat-related illnesses or even death. Children who are left unattended in parked cars are at greatest risk for heat stroke, and possibly death. When traveling with children, remember to do the following:

- Never leave infants, children or pets in a parked car, even if the windows are cracked open.
- To remind yourself that a child is in the car, keep a stuffed animal in the car seat. When the child is buckled in, place the stuffed animal in the front with the driver.
- When leaving your car, check to be sure everyone is out of the car. Do not overlook any children who have fallen asleep in the car.

Use Common Sense

Remember to keep cool and use common sense:

- Avoid hot foods and heavy meals—they add heat to your body.
- Drink plenty of fluids and replace salts and minerals in your body. Do not take salt tablets unless under medical supervision.
- Dress infants and children in cool, loose clothing and shade their heads and faces with hats or an umbrella.
- Limit sun exposure during mid-day hours and in places of potential severe exposure such as beaches.
- Do not leave infants, children, or pets in a parked car. Provide plenty of fresh water for your pets, and leave the water in a shady area.

Hot Weather Health Emergencies

Even short periods of high temperatures can cause serious health problems. Doing too much on a hot day, spending too much time in the sun or staying too long in an overheated place can cause heat-related illnesses. Know the symptoms of heat disorders and overexposure to the sun, and be ready to give first aid treatment.

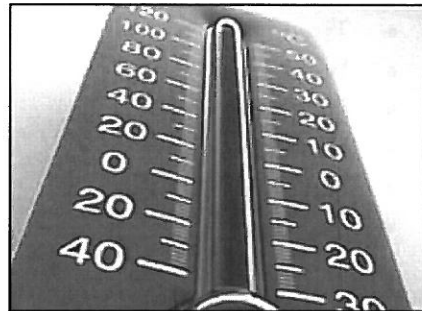
HEAT STROKE

Heat stroke occurs when the body is unable to regulate its temperature. The body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. Body temperature may rise to 106°F or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not provided.

Recognizing Heat Stroke

Warning signs of heat stroke vary but may include the following:

- An extremely high body temperature (above 103°F, orally)
- Red, hot, and dry skin (no sweating)
- Rapid, strong pulse
- Throbbing headache
- Dizziness
- Nausea
- Confusion
- Unconsciousness



What to Do

If you see any of these signs, you may be dealing with a life-threatening emergency. Have someone call for immediate medical assistance while you begin cooling the victim.

Do the following:

- Get the victim to a shady area.
- Cool the victim rapidly using whatever methods you can. For example, immerse the victim in a tub of cool water; place the person in a cool shower; spray the victim with cool water from a garden hose; sponge the person with cool water; or if the humidity is low, wrap the victim in a cool, wet sheet and fan him or her vigorously.
- Monitor body temperature, and continue cooling efforts until the body temperature drops to 101-102°F.
- If emergency medical personnel are delayed, call the hospital emergency room for further instructions.
- Do not give the victim fluids to drink.
- Get medical assistance as soon as possible.

Sometimes a victim's muscles will begin to twitch uncontrollably as a result of heat stroke. If this happens, keep the victim from injuring himself, but do not place any object in the mouth and do not give fluids. If there is vomiting, make sure the airway remains open by turning the victim on his or her side.

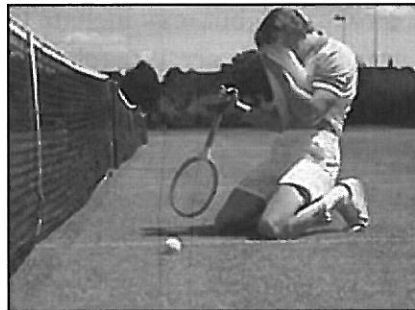
HEAT EXHAUSTION

Heat exhaustion is a milder form of heat-related illness that can develop after several days of exposure to high temperatures and inadequate or unbalanced replacement of fluids. It is the body's response to an excessive loss of the water and salt contained in sweat. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and people working or exercising in a hot environment.

Recognizing Heat Exhaustion

Warning signs of heat exhaustion include the following:

- Heavy sweating
- Paleness
- Muscle cramps
- Tiredness
- Weakness
- Dizziness
- Headache
- Nausea or vomiting
- Fainting



The skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention immediately if symptoms are severe or victims has heart problems or high blood pressure.

Otherwise, help the victim to cool off, and seek medical attention if symptoms worsen or last longer than 1 hour.

What to Do

Cooling measures that may be effective include the following:

- Cool, nonalcoholic beverages
- Rest
- Cool shower, bath, or sponge bath
- An air-conditioned environment
- Lightweight clothing

HEAT CRAMPS

Heat cramps usually affect people who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture. The low salt level in the muscles may be the cause of heat cramps. Heat cramps may also be a symptom of heat exhaustion.

Recognizing Heat Cramps

Heat cramps are muscle pains or spasms—usually in the abdomen, arms, or legs—that may occur in association with strenuous activity. If you have heart problems or are on a low-sodium diet, get medical attention for heat cramps.

What to Do

If medical attention is not necessary, take these steps:

- Stop all activity, and sit quietly in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous activity for a few hours after the cramps subside, because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention for heat cramps if they do not subside in 1 hour.

SUNBURN

Sunburn should be avoided because it damages the skin. Although the discomfort is usually minor and healing often occurs in about a week, a more severe sunburn may require medical attention.

Recognizing Sunburn

Symptoms of sunburn are well known: the skin becomes red, painful, and abnormally warm after sun exposure.



What to Do

Consult a doctor if the sunburn affects an infant younger than 1 year of age or if a fever, fluid-filled blisters or severe pain are present.

Also, remember these tips when treating sunburn:

- Avoid repeated sun exposure.
- Apply cold compresses or immerse the sunburned area in cool water.
- Apply moisturizing lotion to affected areas. Do not use salve, butter, or ointment.
- Do not break blisters.

HEAT RASH

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather. It can occur at any age but is most common in young children.

Recognizing Heat Rash

Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.



What to Do

The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort.

Treating heat rash is simple and usually does not require medical assistance. Other heat-related problems can be much more severe.

Types of Heat Stress

Heat Stroke

Heat stroke is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability if emergency treatment is not given.

Symptoms

Symptoms of heat stroke include:

- Hot, dry skin (no sweating)
- Hallucinations
- Chills
- Throbbing headache
- High body temperature
- Confusion/dizziness
- Slurred speech

First Aid

Take the following steps to treat a worker with heat stroke:

- Call 911 and notify their supervisor.
- Move the sick worker to a cool shaded area.
- Cool the worker using methods such as:
 - Soaking their clothes with water.
 - Spraying, sponging, or showering them with water.
 - Fanning their body.

Types of Heat Stress

Heat Exhaustion

Heat exhaustion is the body's response to an excessive loss of the water and salt, usually through excessive sweating. Workers most prone to heat exhaustion are those that are elderly, have high blood pressure, and those working in a hot environment.

Symptoms

Symptoms of heat exhaustion include:

- Heavy sweating
- Extreme weakness or fatigue
- Dizziness, confusion
- Nausea
- Clammy, moist skin
- Pale or flushed complexion
- Muscle cramps
- Slightly elevated body temperature
- Fast and shallow breathing

First Aid

Treat a worker suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

Types of Heat Stress

Heat Syncope

Heat syncope is a fainting (syncope) episode or dizziness that usually occurs with prolonged standing or sudden rising from a sitting or lying position. Factors that may contribute to heat syncope include dehydration and lack of acclimatization.

Symptoms

Symptoms of heat syncope include:

- Light-headedness
- Dizziness
- Fainting

First Aid

Workers with heat syncope should:

- Sit or lie down in a cool place when they begin to feel symptoms.
- Slowly drink water, clear juice, or a sports beverage.

Types of Heat Stress

Heat Cramps

Heat cramps usually affect workers who sweat a lot during strenuous activity. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.

Symptoms

Muscle pain or spasms usually in the abdomen, arms, or legs.

First Aid

Workers with heat cramps should:

- Stop all activity, and sit in a cool place.
- Drink clear juice or a sports beverage.
- Do not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.
- Seek medical attention if any of the following apply:
 - The worker has heart problems.
 - The worker is on a low-sodium diet.
 - The cramps do not subside within one hour.

Heat Rash

Heat rash is a skin irritation caused by excessive sweating during hot, humid weather.

Symptoms

Symptoms of heat rash include:

- Heat rash looks like a red cluster of pimples or small blisters.
- It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases.

First Aid

Workers experiencing heat rash should:

- Try to work in a cooler, less humid environment when possible.
- Keep the affected area dry.
- Dusting powder may be used to increase comfort.

Cities Pose Special Hazards

The stagnant atmospheric conditions of the heat wave trap pollutants in urban areas and add the stresses of severe pollution to the already dangerous stresses of hot weather, creating a health problem of undiscovered dimensions. A map of heat-related deaths in St. Louis during 1966, for example, shows a heavier concentration in the crowded alleys and lower levels of the inner city, where air quality would also be poor during a heat wave.

The high inner-city death rates also can be read as poor access to air-conditioned rooms. While air-conditioning may be a luxury in normal times, it can be a lifesaver during heat wave conditions.

The cost of cool air moves steadily higher, adding what appears to be a cruel economic side to heat wave fatalities. Indications from the 1978 Texas heat wave suggest that some elderly people on fixed incomes, many of them in buildings that could not be ventilated without air conditioning, found the cost too high, turned off their units, and ultimately succumbed to the stresses of heat.

Preventing Heat-Related Illness

Elderly persons, small children, chronic invalids, those on certain medications or drugs (especially tranquilizers and anticholinergics), and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails.

Heat Wave Safety Tips

Slow down. Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily indoors.

Dress for summer. Lightweight light-colored clothing reflects heat and sunlight, and helps your body maintain normal temperatures.

Put less fuel on your inner fires. Foods (like proteins) that increase metabolic heat production also increase water loss.

Drink plenty of water or other non-alcohol fluids. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty. Persons who (1) have epilepsy or heart, kidney, or liver disease, (2) are on fluid

Know These Heat Disorder Symptoms

HEAT DISORDER	SYMPTOMS	FIRST AID*
SUNBURN	Redness and pain. In severe cases swelling of skin, blisters, fever, headaches.	Ointments for mild cases if blisters appear and do not break. If breaking occurs, apply dry sterile dressing. Serious, extensive cases should be seen by physician.
HEAT CRAMPS	Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating.	Firm pressure on cramping muscles, or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue use.
HEAT EXHAUSTION	Heavy sweating, weakness, skin cold, pale and clammy. Pulse thready. Normal temperature possible. Fainting and vomiting.	Get victim out of sun. Lay down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air conditioned room. Sips of water. If nausea occurs, discontinue use. If vomiting continues, seek immediate medical attention.
HEAT STROKE (or sunstroke)	High body temperature (106° F. or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness.	HEAT STROKE IS A SEVERE MEDICAL EMERGENCY. SUMMON EMERGENCY MEDICAL ASSISTANCE OR GET THE VICTIM TO A HOSPITAL IMMEDIATELY. DELAY CAN BE FATAL. Move the victim to a cooler environment. Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. If temperature rises again, repeat process. Do not give fluids.

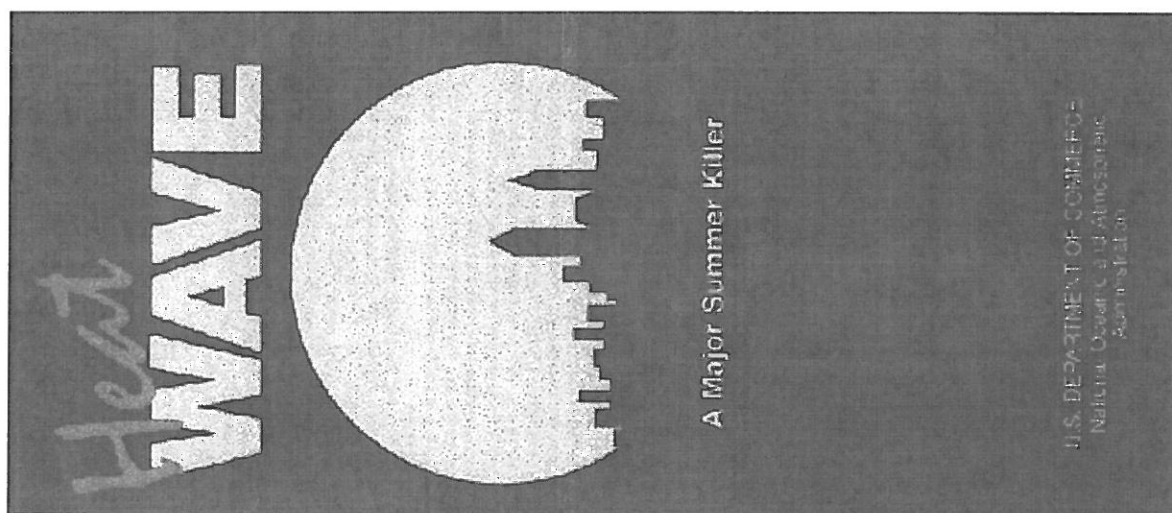
*For more information contact your local American Red Cross Chapter. Ask to enroll in a first aid course.

Produced as a cooperative effort of NOAA's National Weather Service, the Federal Emergency Management Agency, and the American Red Cross.



American Red Cross

NOAA/PA 85001



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration



A National Problem

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. Among the large continental family of natural hazards, only the cold of winter-not lightning, hurricanes, tornadoes, floods, or earthquakes-takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died.

And these are the direct casualties. No one can know how many more deaths are advanced by heat wave weather-how many diseased or aging hearts surrender that under better conditions would have continued functioning.

North American summers are hot; most summers see heat waves in one section or another of the United States. East of the Rockies, they tend to combine both high temperature and high humidity although some of the worst have been catastrophically dry.

NOAA's National Weather Service Heat Index Program

Considering this tragic death toll, the National Weather Service (NWS) has stepped up its efforts to alert more effectively the general public and appropriate authorities to the hazards of heat waves-those prolonged excessive heat/humidity episodes.

Based on the latest research findings, the NWS has devised the "Heat Index" (HI), (sometimes referred to as the "apparent temperature"). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature.

To find the HI, look at the Heat Index Chart. As an example, if the air temperature is 95°F (found on the left side of the table) and the RH is 55% (found at the top of the table), the HI-or how hot it really feels-is 110°F. This is at the intersection of the 950 row and the 55% column.

IMPORTANT: Since HI values were devised for shady, light wind conditions, EXPOSURE TO

Heat Index/Heat Disorders

Heat Index	Possible heat disorders for people in higher risk groups
130° OR HIGHER	HEATSTROKE/SUNSTROKE HIGHLY LIKELY WITH CONTINUED EXPOSURE.
105° - 130°	SUNSTROKE, HEAT CRAMPS OR HEAT EXHAUSTION LIKELY, AND HEATSTROKE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.
90° - 105°	SUNSTROKE, HEAT CRAMPS AND HEAT EXHAUSTION POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.
80° - 90°	FATIGUE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY

FULL SUNSHINE CAN INCREASE HI VALUES BY UP TO 15°F. Also, STRONG WINDS, PARTICULARLY WITH VERY HOT, DRY AIR, CAN BE EXTREMELY HAZARDOUS.

Note on the HI chart the shaded zone above 105°F. This corresponds to a level of HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

The "Heat Index vs. Heat Disorder" table (next to the HI chart) relates ranges of HI with specific disorders, particularly for people in higher risk groups.

Summary of NWS's Alert Procedures

The NWS will initiate alert procedures when the HI is expected to exceed 105° - 110°F (depending on local climate) for at least two consecutive days. The procedures are:

- 1) Include HI values in zone and city forecasts.
- 2) Issue Special Weather Statements and/or Public Information Statements presenting a detailed discussion of (1) the extent of the hazard including HI values, (2) who is most at risk, (3) safety rules for reducing the risk.
- 3) Assist state/local health officials in preparing Civil Emergency Messages in severe heat waves. Meteorological information from Special Weather Statements will be included as well as more detailed medical information, advice, and names and telephone numbers of health officials.

Relative Humidity (%)		Heat Index (Apparent Temperature)	
°F	°C	°F	°C
40	4	90	32
45	7	91	33
50	10	92	34
55	13	93	35
60	16	94	36
65	19	95	37
70	21	96	38
75	24	97	39
80	27	98	40
85	29	99	41
90	32	100	42
95	35	101	43
100	38	102	44
105	41	103	45
110	43	104	46
115	46	105	47
120	49	106	48
125	52	107	49
130	54	108	50
135	57	109	51
140	60	110	52
145	63	111	53
150	66	112	54
155	69	113	55
160	72	114	56
165	75	115	57
170	78	116	58
175	81	117	59
180	84	118	60
185	87	119	61
190	90	120	62
195	93	121	63
200	96	122	64
205	99	123	65
210	102	124	66
215	105	125	67
220	108	126	68
225	111	127	69
230	114	128	70
235	117	129	71
240	120	130	72
245	123	131	73
250	126	132	74
255	129	133	75
260	132	134	76
265	135	135	77
270	138	136	78
275	141	137	79
280	144	138	80
285	147	139	81
290	150	140	82
295	153	141	83
300	156	142	84
305	159	143	85
310	162	144	86
315	165	145	87
320	168	146	88
325	171	147	89
330	174	148	90
335	177	149	91
340	180	150	92
345	183	151	93
350	186	152	94
355	189	153	95
360	192	154	96
365	195	155	97
370	198	156	98
375	201	157	99
380	204	158	100
385	207	159	101
390	210	160	102
395	213	161	103
400	216	162	104
405	219	163	105
410	222	164	106
415	225	165	107
420	228	166	108
425	231	167	109
430	234	168	110
435	237	169	111
440	240	170	112
445	243	171	113
450	246	172	114
455	249	173	115
460	252	174	116
465	255	175	117
470	258	176	118
475	261	177	119
480	264	178	120
485	267	179	121
490	270	180	122
495	273	181	123
500	276	182	124
505	279	183	125
510	282	184	126
515	285	185	127
520	288	186	128
525	291	187	129
530	294	188	130
535	297	189	131
540	300	190	132
545	303	191	133
550	306	192	134
555	309	193	135
560	312	194	136
565	315	195	137
570	318	196	138
575	321	197	139
580	324	198	140
585	327	199	141
590	330	200	142
595	333	201	143
600	336	202	144
605	339	203	145
610	342	204	146
615	345	205	147
620	348	206	148
625	351	207	149
630	354	208	150
635	357	209	151
640	360	210	152
645	363	211	153
650	366	212	154
655	369	213	155
660	372	214	156
665	375	215	157
670	378	216	158
675	381	217	159
680	384	218	160
685	387	219	161
690	390	220	162
695	393	221	163
700	396	222	164
705	399	223	165
710	402	224	166
715	405	225	167
720	408	226	168
725	411	227	169
730	414	228	170
735	417	229	171
740	420	230	172
745	423	231	173
750	426	232	174
755	429	233	175
760	432	234	176
765	435	235	177
770	438	236	178
775	441	237	179
780	444	238	180
785	447	239	181
790	450	240	182
795	453	241	183
800	456	242	184
805	459	243	185
810	462	244	186
815	465	245	187
820	468	246	188
825	471	247	189
830	474	248	190
835	477	249	191
840	480	250	192
845	483	251	193
850	486	252	194
855	489	253	195
860	492	254	196
865	495	255	197
870	498	256	198
875	501	257	199
880	504	258	200
885	507	259	201
890	510	260	202
895	513	261	203
900	516	262	204
905	519	263	205
910	522	264	206
915	525	265	207
920	528	266	208
925	531	267	209
930	534	268	210
935	537	269	211
940	540	270	212
945	543	271	213
950	546	272	214
955	549	273	215
960	552	274	216
965	555	275	217
970	558	276	218
975	561	277	219
980	564	278	220
985	567	279	221
990	570	280	222
995	573	281	223
1000	576	282	224

With Prolonged Exposure and/or Physical Activity

Heat stroke or sunstroke highly likely
Sunstroke, muscle cramps, and/or heat exhaustion likely
Extreme Caution
Sunstroke, muscle cramps, and/or heat exhaustion possible
Caution
Fatigue possible

Heat Index Chart

Air Temperature and Relative Humidity versus Apparent Temperature

Release to the media and over NOAA's own Weather Radio all of the above information.

How Heat Affects the Body

Human bodies dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands, and-as the last extremity is reached-by panting, when blood is heated above 98.6 degrees. The heart begins to pump more blood, blood vessels dilate to accommodate the increased flow, and the bundles of tiny capillaries threading through the upper layers of skin are put into operation. The body's blood is circulated closer to the skin's surface, and excess heat drains off into the cooler atmosphere. At the same time, water diffuses through the skin as perspiration. The skin handles about 90 percent of the body's heat dissipating function.

Sweating, by itself, does nothing to cool the body, unless the water is removed by evaporation-and high relative humidity retards evaporation. The evaporation process itself works this way: the heat energy required to evaporate the sweat is extracted from the body, thereby cooling it. Under conditions of high temperature (above 90 degrees) and high relative humidity, the body is doing everything it can to maintain 98.6 degrees inside. The heart is pumping a torrent of blood through dilated circulatory vessels; the sweat glands are pouring liquid-including essential

dissolved chemicals, like sodium and chloride-onto the surface of the skin.

Too Much Heat

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating, or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop.

Ranging in severity, heat disorders share one common feature: the individual has overexposed or overexercised for his age and physical condition in the existing thermal environment. Sunburn, with its ultraviolet radiation burns, can significantly retard the skin's ability to shed excess heat.

Studies indicate that, other things being equal, the severity of heat disorders tend to increase with age-heat cramps in a may be heat exhaustion in someone 40, and heat stroke in a person over 60.

Acclimatization has to do with adjusting sweat-salt concentrations, among other things. The idea is to lose enough water to regulate body temperature, with the least possible chemical disturbance.