www.TraditionalMountaineering.org

AVOIDING HEAT RELATED ILLNESSES

HEAT KILLS IN THREE DISTINCT STEPS:

STEP ONE: OVER HEATING, INEFFICIENCY AND DEHYDRATION BEGIN
The moment your body begins to gain heat faster than it can cool the blood, heat related illnesses begin and two things happen:

1. You will voluntarily sweat to maximize your cooling potential and your heart rate will rise, limiting your ability to use your muscles.
2. Your physical and mental efficiency will decline as the blood is diverted from the muscles to the skin and as you become dehydrated.

Both responses drain your limited energy reserves. The only way to stop the drain on stored body fluids and on stored carbohydrates (glycogen) is to limit the degree of exposure. *The time to act to prevent heat related illnesses is during the period of heat exposure and gradual exhaustion.*

STEP TWO: HEAT EXHAUSTION SETS IN
If overheating continues until your limited cooling capacity is over taxed, the following happens:

1. Your body looses blood volume as you become dehydrated, blood flow to the skin increases and blood flow to the muscles and vital organs decreases limiting performance and mental capacity.
2. Your body goes into mild circulatory shock.

STEP THREE: HEAT STROKE CAUSES COLLAPSE AND DEATH
If you ignore the signs and symptoms of heat exhaustion, your body systems will be overwhelmed by heat and begin to stop functioning.

1. Heat stroke occurs when the signs of heat exhaustion are ignored.
2. Heat stroke is a life threatening condition.
3. Sweating stops because body fluid levels are low and body systems are overwhelmed.
4. Body temperature rises rapidly, reaching temperatures of from 105 to 108 degrees.
5. The kidneys, heart and brain begin to fail; convulsions, coma and death will follow.

YOUR FIRST LINE OF DEFENSE: AVOID OVERHEATING AND DEHYDRATION

1. **STAY COOL**: 105-degree air temperatures are not uncommon; body temperatures of 105 degrees will lead to collapse. Avoid the heat of the day; travel at night or in the early morning hours.
2. **DRINK COOL WATER AND ELECTROLYTE REPLACEMNT DRINKS:** Do not ingest high concentrations of salt in tablets or drinks.
3. **BEWARE HUMIDITY:** High humidity compromises the ability of sweat to evaporate from the skin. *Don't ask, "How hot is the air?", ask "How humid is it, can my body cool itself?"*
4. **SLOWDOWN OR STOP:** The blood supply to the working muscles has been diverted to your skin to maximize the evaporative cooling system of your body. You will not be able to maintain a high level of aerobic activity. Contractions of the major muscle groups of the body produce large amounts of heat. Trying to maintain a high muscle demand will further overrun your ability to cool your body.
5. **WEAR A LARGE LIGHT HAT AND LOOSE, LIGHT, COOL CLOTHING:**

YOUR SECOND LINE OF DEFENSE: TERMINATE EXPOSURE AND FORSTALL EXHAUSTION
You may think you are cool enough now, but consider what will happen if you are forced to continue using your muscles to complete a dangerous route or to help an injured or exhausted companion. *Stop before you compromise your cooling systems.*

Before you become a victim of heat related injury, you must:

1. Give up your peak or destination or whatever you had in mind.
2. Get out of the sun, stay in one place, and concentrate on staying hydrated and cool.
3. Eat and drink to restore your blood volume, electrolytes and sugar to enable your blood to circulate well.
4. Talk with your companions and make a plan.

YOUR THIRD LINE OF DEFENSE: WATCH FOR THE OCCURANCE OF HEAT RELATED INJURIES
Appoint a hot-weather leader whose job is to think about the dangers of this insidious problem for outdoor recreationists. This person might be the best-protected member of the group; responsible for calling a halt before the least protected member of the group becomes overheated or exhausted. *Watch yourself and others for the following overt symptoms:*

HEAT EXHAUSION SIGNS AND SYMPTOMS

1. *Normal or below normal body temperature*
2. *Cool, moist, pale skin.* (Skin may be red in the early stage, immediately following exertion.)
3. Headache.
4. Nausea.
5. Dizziness and weakness.
6. Apparent exhaustion.

HEAT STROKE SIGNS AND SYMPTOMS

1. *High body temperature (often as high as 105 degrees.)*
2. *Red, hot, dry skin.*
3. Progressive loss of consciousness.
4. Rapid, weak pulse.
5. Rapid, shallow breathing.

YOUR FOURTH AND LAST LINE OF DEFENSE: TREATMENT
The patient may deny he is in trouble (I'm OK, I'm OK). Believe the symptoms not the patient. Even mild symptoms demand immediate, drastic treatment. *The patient himself is unable to understand his problem.*

1. Get the patient out of the sun.
2. Strip off all clothing.
3. Treat as for shock.
4. If the patient is only mildly impaired (HEAT EXHAUSTION), *cool the body:*
    a. Give him *small sips (half-cup every few minutes)* of cool drinks and electrolyte replacement.
    b. Cool the body by any means available: cool wet cloths to wipe away hot sweat, etc.
    c. Fan the wet body.
    d. (Use the principles of conduction, convection, radiation and evaporation to help cool the body)
5. If the patient is semiconscious or worse (HEAT STROKE), *do your best*:
    a. Try to keep him awake, *cool the body.*
    b. Gently avoid injury from his convulsions.
    c. Prepare to keep the airway open and give CPR.
    d. Arrange immediate transport to a hospital.

HEAT CRAMPS:
Overheating may be accompanied by muscle heat cramps. This is a separate condition caused by fluid and electrolyte loss in the muscles. These cramps can develop rapidly and are a warning of the early stages of heat related illness.

1. Treat the same as for heat exhaustion.
2. Massage the cramped muscles gently until cooling, re-hydration and electrolyte replacement have had their effect.

Read Backcountry First Aid and Extended Care by Buck Tilton for Wilderness Medicine Institute of NOLS for care of heat related illness. Carry a copy with your essentials.

Stay hydrated, nourished with carbohydrates, in a continuously aerobic state, cool and protected by your clothing and accessories from heat related illness caused by overexertion in hot moist weather.

Traditional\Seminars\Hyperthermia.doc