

Heat Related Injuries

Heat injuries are close cousins to their winter time counterparts. Where [hypothermia](#) is the reduction of normal body temperature by 2-1/2 degrees or more, heat injuries is when the body temperatures soars above normal, or the body loses it's ability to regulate heat due to exertion or exposure to a hot climate. Just like hypothermia, the very old, the very young, and those with circulatory disorders are more likely to get heat related injuries.

Every year heat related injuries kill experienced, well-conditioned hikers. In the United States Grand Canyon National Park claims five to ten people each year on average for heat related death, and hundreds of people are treated for heat related injuries. Just like it's cold weather cousin hypothermia, victims of dehydration, heat exhaustion and heatstroke tend to ignore their condition until it is too late.

Dehydration is a major contributing factor to heat related injuries. Proper hydration when outdoors in hot conditions is very critical in aiding the prevention of heat related injuries. Under normal conditions the body loses about one gallon of fluid a day through sweating, breathing, and going to the bathroom. Certain medical conditions, like severe diarrhea, can up the fluid loss too as much as six gallons of fluid in a day. When you engage in strenuous activity the amount of fluid loss greatly increases.

You should drink at least one quart of fluid for each hour you are out doing physical activity. Having your water bottle in your pack and drinking during breaks is not the best strategy. Continuous hydration by either carrying a water bottle or by using a hydration pack is much better strategy. Don't wait until you are thirsty.

When you get into a dehydrated state you are weak, dizzy, profoundly exhausted and can have problems thinking clearly. Feeling nauseous, being drenched in sweat, dark urine with a strong odor, and having cramps are also warning signs of dehydration. More severe dehydration can be indicated by taking a pinch of skin from the back of the hand, if the pinched fold stays up (the skin is no long pliable) you are becoming dangerously dehydrated.

Drinking lots of fluid with some a small amount of salt helps treat early dehydration. Severe dehydration requires medical attention, typically IV fluids are given.

Heat exhaustion is the next step beyond simple dehydration. Because of a large loss of body fluid, the circulatory system can collapse, causing a sudden drop in blood pressure, which can lead to unconsciousness. Because heat exhaustion is the next step past dehydration, it gives a lot of warning signs before its onset.

Increasing fatigue, severe cramps, weakness, inability to think properly or strange behavior, drenching sweats, dilated pupils, and nausea are all warning signs of heat exhaustion. A person with more severe heat exhaustion can have cold, pale, clammy skin, be agitated or disoriented, and can complain of profound thirst.

Heat exhaustion is a serious medical condition. The first step is to get the victim in a cooler environment. Out of the sun at the bare minimum. Elevate the feet about twelve inches and have them lie down on a flat surface. Elevating the feet helps keep blood flowing to the brain. Apply cool clothes, wet compresses to the skin of the victim. Fan them down to help aid convection cooling. Do not use rubbing alcohol. Have them sip non-carbonated sports drinks like Gatorade or lightly salted water. Cool water will work fine if nothing else is available. Do not drink caffeine or alcohol as both effect the body's ability to regulate heat. Be careful not to cool the victim down to the point they get hypothermia (believe it or not, a common mistake in treating heat injuries). Medical attention should be sought out as soon as possible for victims of heat exhaustion.

Sunstroke (heatstroke) is a life threatening medical emergency. It is one of the few medical emergencies where heroic measures need to be taken immediately to help save the victims life. Sunstroke is the opposite of hypothermia. It's medical name is actually hyperpyrexia. Dehydration is usually the first warning signs of sunstroke, although symptoms can strike suddenly. Just like hypothermia, where the body can no longer keep warm, sunstroke is when the body can no longer regulate the temperature and it soars out of control. Victims of sunstroke have had body temperatures of 110 degrees, and 106 is quite common. Without immediate, heroic treatment, permanent brain damage or death can happen.

Sunstroke victims can have severe headaches, vertigo, fatigue, sweating is usually **but not always** decreased, some victims stop sweating, their skin is red, hot and dry to the touch. Their pulse can be racing over 160, disorientation, being argumentative, combative, and complaining about

being profoundly thirsty or that they are burning up is very common, small or pin-point pupils, unconsciousness and convulsions are the severest symptoms. As the temperature soars above 103 degrees and out of control, circulatory collapse can occur resulting in death. Patients with severe sunstroke, where the body temperature got above 105 degrees can experience permanent brain and/or kidney damage.

Sunstroke must be treated immediately if proper medical facilities are not nearby. Sunstroke victims need to be wrapped in water soaked sheets or bedding. Their bodies need to be fanned. Placing them in a cool lake or river (supporting their heads to keep it above water) and drench the head. If all else fails you can pour cool water, cold mud, or anything else possible that is cool on them (except alcohol). Fanning their body also helps cause convection to aid in cooling (when the body is wet). Cold packs on the neck, armpits, and groin area also help aid in cooling. Make sure you don't cool the victim down too much and put them in a hypothermic state. Do not administer fluids, do not put rubbing alcohol on the skin, and do not give salt tablets. Once the victim has become more stable, sips of sugary drinks or water can be given. Immediate medical attention is absolutely required. Never attempt to treat sunstroke on your own unless you are in the field and heroic measures need to be taken.

Prevention of heat related injuries are very simple and require just a little common sense:

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Wear a hat with a broad rim. Believe it or not, especially in extreme heat, a broad rimmed hat made of breathable material aids in keeping you cool. It keeps the sun from directly hitting the top of your head, where almost 50% of our body heat loss occurs.

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Avoid sunburn. People with sunburns have a more difficult time regulating heat. When in hot climates with sun exposure use a proper sunscreen, being particularly sensitive to your face, nose, ears, back of your neck and your feet if you wear sandals without socks.

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Wear loose fitting clothing that allows sweat to evaporate quickly when in hot climates. Some companies make outstanding clothing out of hybrid

synthetic materials blended with cotton that wick sweat away quickly and allows it to evaporate quickly.

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Drink plenty of fluids, at least one quart per hour in hot conditions. Non-carbonated sports drinks like Gatorade may help, as a small amount of salt in cool water. There is tremendous debate on taking salt tablets to prevent dehydration, our non-medical recommendation is to avoid salt tablets. Don't wait until you are thirsty to have a drink (it's already too late).

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Do not ignore your bodies warning signals. Cramps, nausea, weakness, dark urine or blood tinted urine, being profoundly sweaty, dizziness, and feelings of extreme thirst are all early warning signs of heat related injuries. Take the proper steps to protect yourself.

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Do not engage in desert hiking unless you have prior experience alone. Travel with a well-seasoned outfitter, take courses, and if you are in desert conditions avoid hiking during the heat of the day. If you must move take extra steps to remain hydrated. Don't underestimate what the sun can do to you.

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Don't drink alcohol or caffeinated drinks before during or immediately after exposure to heat while out in the field. Both of these negatively effect your body's ability to regulate heat.

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If you or someone in your party is suffering from symptoms of heat injuries, seek proper medical treatment immediately.