

Heat Related Illnesses

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The summer heat can cause medical conditions ranging from mild swelling of the ankles to life threatening hyperthermia. Heat related injury to the body can occur as a result of several processes. Environmental temperature, humidity, physical activity and the amount of clothing worn all contribute to the heat load on the human body. Internal heat is generated by our body's natural metabolic processes. Internal heat generation is increased with increased physical activity. External heat is the result of higher environmental temperatures or exposure to a hot work environment.

Our bodies dissipate heat by four basic mechanisms. All involve heat being released from the skin's surface into the environment. As environmental temperature approaches body temperature less heat is lost. That is why during heat waves people may suffer from heat related illnesses. *Radiation* is the loss of heat from the body to the environment. Our bodies radiate heat to cooler surroundings without anything in direct contact with our skin. *Conduction* is the transfer of heat to cooler object that is in direct contact with our body. That is why it is more comfortable to lay on a cool surface on a hot day than to stand out in the sun. *Convection* is the transfer of heat to cooler air currents that flow over the surface of the skin. That is it why it feels cooler when a fan or air conditioner circulates the cool air than when the air is stagnant. *Evaporation* is the vaporization of water (sweat) on our skin. The process of evaporation causes heat to be lost from the skin's surface. Sweat evaporation is less efficient when there is high humidity, which decreases the rate of moisture evaporation.

Heat cramps are painful cramps of heavily used muscles. They typically occur during or several hours after physical activity. Treatment is rest, fluids and over the counter pain medications.

Heat edema is a swelling of the ankle, foot or wrist as a result of heat exposure for several days. It is treated with elevation of the swollen area and may take several days to resolve.

Heat rash (prickly heat) is a red, itchy, sometimes swollen rash that occurs in areas of tight or constricting clothing. Treatment is to wear loose fitting clothing in the hot weather and change clothes they become moist.

Heat exhaustion is caused by work, or exercise, in a hot environment with either not enough fluid intake or fluid intake that is poor in salt. Symptoms include temperature elevation and may include any of the following: weakness, headache, nausea, vomiting, muscle cramps, sweating, fast heart rate, dizziness and muscle aches. The person's mental status will not be impaired. If untreated this condition could evolve into life threatening heatstroke. These people should rest and be placed in a cool environment given fluids and evaluated by medical personnel as soon as possible.

Heat syncope, (fainting) is caused by loss of the body’s ability to maintain blood pressure at a time of sweating and decreased fluid intake. It may be preceded by dehydration because of not drinking enough, other chronic illnesses or medications. It is difficult to tell if this represents a more serious medical condition and medical evaluation should be sought.

Heat stroke represents a true medical emergency. It typically occurs in the elderly who have been exposed to high environmental temperatures for several days. They often have medical conditions that predispose them to heat related illnesses (see table). These patients have high temperature and some alteration of their mental status. Their symptoms may vary from being mildly confused to being in a coma. These patients should be taken directly to the nearest emergency department for evaluation.

A different kind of heatstroke is exertional heatstroke. Exertional heatstroke typically occurs during hot weather in people working in certain environmental or protective work gear that does not allow the body to dissipate heat. It can also occur in athletes exercising in the heat. Exertional heatstroke occurs over hours not days and is characterized by high body temperature and some change in mental status. This is a medical emergency and these people should be taken to the nearest emergency department for evaluation.

Preventing heat related illness is most important. Stay in cool environment when the outside temperature is high. Wear loose fitting light colored clothes. Drink plenty fluids during the day. Drink extra fluids if you need to be outside during the day and take frequent stops to cool down and drink. Supervisors need to watch workers for signs of heat exhaustion as listed above. Check in on elderly family and neighbors since they are more at risk for heat related illnesses. If you do not live in an air conditioned home, go the mall or library or other public buildings that are air conditioned for some relief from the heat. This will allow your body some recovery time from the heat. Many cities during heat waves offer “cooling stations” for their citizens to prevent these heat related problems.

Medical and Social Risk Factors in Heat Related Illnesses
Uncontrolled High Blood Pressure
Diabetes
Poor circulation (peripheral vascular disease)
Obesity
Skin diseases that prevent or reduce sweating
Poverty
Socially isolated
Substance abuse