

Heat-Related Emergencies  
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Heat cramps are usually associated with strenuous physical activity in a hot humid environment--a place like South Florida in August! They result from losing sodium, one of the bodies salts, during profuse perspiration, especially when accompanied by hyperventilation and exertion. Local accumulation of lactic acid, one of the waste products of inefficient metabolism by our muscles, along with the alkalotic state of hyperventilation disrupts the normal balance of potassium (another important salt for the body) and sodium from their normal physiologic relationship. Sodium is lost from the body, potassium leaves the blood stream and is sequestered in the cells.

Clinically, the body temperature is normal, there is no significant dehydration, but the sodium, potassium, magnesium, phosphate and acids of the body are disrupted from their carefully balanced normals. Prompt correction is usually possible with intravenous fluid and salt administration. Mild cases can be treated with a balanced-salt containing solution taken orally. Cooling is also very helpful to help relieve the patient as the painful cramps diminish.

Heat exhaustion is different in that there is dehydration and loss of the bodies salts (especially potassium and sodium). Temperature is mildly elevated, usually to less than 101' farenheit. Fatigue progresses to light-headedness, nausea and vomiting with severe headache. If the process is allowed to continue, severe dehydration and shock can develop. Treatment includes prompt rest, cooling and fluid and salt replacement, usually by IV, although orally in mild cases.

Heat stroke is a true medical emergency characterized by hyperpyrexia with a body temperature > 106'F, neurologic symptoms, and absence of sweating. Those most at risk include patients who are elderly, debilitated, quadriplegics, patients with cystic fibrosis, and those with the congenital absence of sweat glands. Certain medications-especially those that prevent sweating can also predispose patients to this condition. Such medications include anticholinergic agents (for controlling urinary incontinence or diarrhea), antihistamines, phenothiazine-type major tranquilizers, cyclic antidepressants, MOA inhibitors, LSD, amphetamines and certain anesthetics. There is usually a sudden deterioration of neurologic function--often without warning! Any neurologic presentation is possible, seizures, fainting, coma, altered behavior or mental status, many things can arouse

suspicion. These findings with a very high body temperature provide the clue. Even before the neurologic symptoms develop, brain damage can begin to occur. The condition can also cause heart failure, problems with the liver, kidneys, and blood stream are also common. Dehydration and volume depletion may not occur in some cases of heat stroke. Overly vigorous volume replacement with IV fluids can cause fluid overload and problems with heart failure and fluid backing up in the lungs.

Treatment of heat stroke includes aggressive therapy to lower the body temperature\; remove all of the clothing when possible, pack the groins and arm pits with ice packs. Allowing a fan to blow over the patients while they are sprayed with a light mist can cause very rapid cooling--enough to produce uncomfortable shivering. If this is done, take care to monitor the patient's temperature, stop the aggressive cooling before it gets below 100' prevent bringing the body temperature to low. These patients really need to be treated in the Emergency Department or Intensive Care Unit of a hospital, as all sorts of complications with the nervous system, heart, lungs, liver, kidneys, etc. can occur and need to be carefully monitored.

The summer in South Florida is a wonderful time for many of us. Take time to drink plenty of fluids when outside. If you have questions about any medications that you are taking be sure to talk to your doctor or pharmacist. Be careful to watch out for people who cannot take care of themselves, including babies, the elderly and debilitated. The key to taking care of yourself is to avoid overexertion in the heat of the day and keep the fluids--especially chilled fluids coming! Air conditioning is a big help at this time of the year, but remember, people can actually survive in Florida without it if they prepare carefully. Be sure to make sure your pets have plenty of water to drink too.

Have a great summer and be careful!