

Heat Related Illnesses

By Marc R. Bernier, MPT CSCS

Heat related illnesses have received significant attention in the media over the past few years due to many high profile catastrophic incidents at both the collegiate and professional levels, most notably in football. Unfortunately, the sport of soccer is not immune to these conditions. Heat related illnesses are serious medical conditions that all coaches and parents need to become familiar with, so that immediate recognition and treatment can be initiated should they occur to any of our youth players. Youth players are at greater risk for these conditions than adults due to their inability to adapt as well as adults to high temperatures.

Heat cramps are the first form of heat illness that are characterized by involuntary muscle spasms that occur either during or after intense athletic activity in the heat. The most common areas for these cramps to occur is in the calves, hamstrings, or abdomen due to the excessive amounts these muscles are used during the sport of soccer. It is believed that this condition occurs due to an imbalance in the body's fluid and electrolyte concentrations. During athletic competitions, electrolytes such as sodium chloride (salt) are lost through sweating. If excessive amounts of salts or water are lost due to excessive sweating, or if inadequate amounts of salt are consumed prior to the event through normal diet, cramps can result. The best treatment is prevention; athletes should ensure proper hydration prior to exercising in elevated temperatures, and add small amounts of salt to meals in the days leading up to the competition (assuming the player does not have any medical conditions that necessitate the avoidance of excessive salt in the diet). If cramping occurs, the first step is to attempt to gently stretch the affected muscle group; massaging the affected area can also be effective. As soon as the initial effects of the cramping have subsided, the athlete needs to rehydrate and ingest some form of salt (it is important to note that thirst is not a good indicator of the onset of dehydration; once a player is thirsty, they have already become dehydrated). This can be best accomplished by consuming an electrolyte drink such as Gatorade or Powerade, which will provide both fluid and electrolytes. Post-game meals should include small amounts of table salt to assist this process. Medical attention is not typically required, unless heat cramps are a very frequent occurrence. If they are frequent, consult your physician to attempt to determine the probable cause.

Heat exhaustion is a more significant medical condition in which the body's temperature control mechanism remains functional, but the athlete experiences clinical symptoms due to excessive water loss during sweating and a drop in blood pressure due to a dilation of the blood vessels in an attempt to assist the heat loss process in order to cool the body. Symptoms of heat exhaustion typically include the following:

1. Cool, clammy skin; or slightly elevated skin temperature (not hot to the touch).
2. Sweating is reduced but is present.
3. Excessive thirst; dry mouth.
4. Fatigue, general weakness, dizziness, coordination deficits, mental dullness.
5. Weak pulse, low blood pressure.

Treatment for heat exhaustion is an immediate cessation of all activities, have the athlete rest in a shaded area, and slowly consume cool water to begin the rehydration process. Gentle cooling techniques such as fanning and applying wet towels or sponges with cool water should also be initiated. The athlete should be monitored to ensure that symptoms do not worsen; if they do, emergency personnel should be contacted, or escort the athlete to the nearest hospital's emergency room. If this condition developed during a tournament weekend, the player should not be allowed to return to play again. When possible, the player should visit his/her family physician to ensure no complications arise and to receive clearance to return to play.

Heat stroke is the most serious and complex of the heat related illnesses and requires immediate emergency personnel medical attention. This condition is characterized by a sudden failure of the body's temperature control mechanism, resulting in a medical emergency. When the body's temperature control mechanism fails, sweating ceases to occur and the body's temperature elevates to dangerous levels, causing excessive stress to the circulatory system. In many cases, the symptoms of a heat stroke can be subtle, so careful attention to the status of the athlete is extremely important. Symptoms of heat stroke include the following:

1. Abrupt onset, preceded by headache, vertigo, fatigue.
2. Hot, dry skin.
3. Absence of sweating.
4. Rapid pulse rate and shallow breathing.
5. Vomiting, diarrhea.
6. Athlete feels as if they are "burning up."
7. Involuntary limb movement, seizures.
8. Irrational mental state.

Once recognized, this condition must be treated aggressively and quickly. Remember heat stroke is a medical emergency and should be treated as such. Emergency medical personnel must be contacted immediately (call 911). While waiting their arrival, extreme methods must be implemented in an attempt to reduce the player's body temperature quickly. If possible, attempt any or all of the following treatments:

1. Immerse player in cold water.
2. Application of ice packs to body, especially neck or underarms.
3. Alcohol rubs.
4. Fan over body.
5. Massaging of limbs to assist circulatory system.
6. Remove excessive clothing.
7. Wrap player in wet towels.

It is important to understand that all of the symptoms listed do not have to be present to signal the occurrence of a heat stroke; any of the symptoms should be taken seriously and evaluated by medical personnel. Additionally, it is possible for an athlete to initially present with heat cramps, progress to heat exhaustion, and end with a heat stroke. Therefore, all symptoms of heat related illness must be closely monitored and evaluated by a physician.

Although hydration levels and air temperature are contributing factors to heat related illnesses, there are many other components that make their occurrence more likely. Some of these factors include:

1. Variations in body size and fat composition.
2. Conditioning levels and climate acclimatization.
3. Exercise intensity.
4. Amount, type and color of clothing.
5. Relative humidity.

Relative humidity is probably one of the most important considerations in heat related illnesses, which makes it very applicable to those living in the very humid southeast. According to some sources, numerous football deaths have been recorded when the air temperature was below 75° F, but with a relative humidity greater than 95%.

Prevention of heat related illnesses is obviously the treatment of choice. Steps to take include proper hydration before exercising in hot temperatures, proper diet, proper conditioning, appropriate clothing, and avoidance of athletic events in extreme heat. However, the most important preventative measure is frequent water breaks (every 15 minutes) during hot and humid conditions and ensure all players are consuming fluids during these breaks. Additionally, take any symptoms of heat illness seriously, cease activities if they occur, and seek medical attention. The potential risk for complications, including death, are too serious not to.

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The National Center for Sports Safety (NCSS) was founded to promote the importance of injury prevention and safety on all levels of youth sports through education and research. Recently, the NCSS in conjunction with the National Athletic Trainers’ Association launched a comprehensive sports safety course called **P.R.E.P.A.R.E.** The course covers a wide range of injuries from blisters and sprains to life-threatening head and neck injuries. The three-hour course can be found on the NCSS website at www.SportsSafety.org. For more information, contact the National Center for Sports Safety at 877-900-NCSS.