

How to Recognize, Prevent & Treat Exertional Heat Illnesses

Many cases of exertional heat illness are preventable and can be successfully treated if such conditions are properly recognized and appropriate care is given in a timely manner. It is key to educate athletes, coaches, and parents on what can be done to avert dehydration, exertional heat stroke (EHS), heat exhaustion, and heat cramps.

DEHYDRATION

When athletes do not replenish lost fluids, they become dehydrated.

Signs and Symptoms:

- Dry mouth
- Thirst
- Being irritable or cranky
- Headache
- Seeming bored or disinterested
- Dizziness
- Cramps
- Excessive fatigue
- Not able to run as fast or play as well as usual

Treatment:

- Move athlete to a cool environment and rehydrate.
- Maintain normal hydration (as indicated by baseline body weight).
- Begin exercise sessions properly hydrated. Any fluid deficits should be replaced within 1 to 2 hours after exercise is complete.
- Hydrate with a sports drink like Gatorade, which contains carbohydrates and electrolytes (sodium and potassium) before and during exercise is optimal to replace losses and provide energy.
- Hydrate throughout sports practice to minimize dehydration and maximize performance.
- Seek medical attention to replace fluids via an intravenous line if athlete is nauseated or vomiting.

Return-to-Play Considerations:

- If degree of dehydration is minor and the athlete is symptom free, continued participation is acceptable

EXERTIONAL HEAT STROKE

A severe illness characterized by central nervous system (CNS) abnormalities and potentially tissue damage resulting from elevated body temperatures induced by strenuous physical exercise and increased environmental heat stress.

Signs and Symptoms:

- Increase in core body temperature, usually above 104°F/40°C when athlete falls ill
- Central nervous system dysfunction, such as altered consciousness, seizures, confusion, emotional instability, irrational behavior or decreased mental acuity
- Nausea, vomiting or diarrhea
- Headache, dizziness or weakness
- Hot and wet or dry skin
- Increased heart rate, decreased blood pressure or fast breathing
- Dehydration
- Combativeness

Treatment:

- Aggressive and immediate whole-body cooling is the key to optimizing treatment. The duration and degree of hyperthermia may determine adverse outcomes. If untreated, hyperthermia-induced physiological changes resulting in fatal consequences may occur within vital organ systems (muscle, heart, brain, etc.). Due to superior cooling rates, immediate whole-body cooling (**cold water immersion**), is the best treatment for EHS and should be initiated within minutes post-incident. It is recommended to cool first and transport second if onsite rapid cooling and adequate medical supervision are available.

Return-to-Play Considerations:

- The athlete’s physician should devise a careful return-to-play strategy that can be implemented with the assistance of a qualified health care professional.

HEAT EXHAUSTION

Heat exhaustion is a moderate illness characterized by the inability to sustain adequate cardiac output, resulting from strenuous physical exercise and environmental heat stress.

Signs and Symptoms:

- Athlete finds it hard or impossible to keep playing
- Loss of coordination, dizziness or fainting
- Dehydration
- Profuse sweating or pale skin
- Headache, nausea, vomiting or diarrhea
- Stomach/intestinal cramps or persistent muscle cramps

Treatment:

- Remove athlete from play and immediately move to shaded or air-conditioned area.
- Remove excess clothing and equipment.
- Cool athlete until body temperature is approximately 101°F (38.3°C)
- Have athlete lie comfortably with legs propped above heart level.
- If athlete is not nauseated, vomiting or experiencing any CNS dysfunction, rehydrate orally with chilled water or sports drink. If athlete is unable to take oral fluids, implement intravenous infusion of normal saline.

- Monitor heart rate, blood pressure, respiratory rate, core temperature and CNS status.
- Transport to an emergency facility if rapid improvement is not noted with prescribed treatment.

Return-to-Play Considerations:

- Athlete should be symptom free and fully hydrated; recommend physician clearance; rule out underlying condition that predisposed him/her for continue problems; and avoid intense practice in heat until at least the next day.

HEAT CRAMPS

Muscle cramps are not well understood. Heat cramps are often present in athletes who perform strenuous exercise in the heat. Conversely, cramps also occur in the absence of warm or hot conditions, which is common in ice hockey players.

Signs and Symptoms:

- Intense pain (not associated with pulling or straining a muscle)
- Persistent muscle contractions that continue during and after exercise

Treatment:

- Reestablish normal hydration status and replace some sodium losses with a sports drink or water
- Some additional sodium may be needed (especially in those with a history of heat cramps) earlier in the activity.
- Light stretching, relaxation and massage of the involved muscle may help acute pain of a muscle cramp.

Return-to-Play Considerations:

- Athletes should be assessed to determine if they can perform at the level needed for successful participation.