

Heat stress in school athletics

Risk Control services

from Liberty Mutual Insurance



Highlights:

- Toxic effects of excess heat
- Signs and symptoms
- Controls

Heat stress is a combination of environmental conditions, physical demands, and clothing requirements that are likely to increase the body temperature, heart rate, and sweating.

Athletic activities conducted outdoors in hot weather have the potential to cause heat stress among exposed workers and students.

Three major heat-related illnesses

Three major illnesses can occur because of the body's inability to cope with excess heat load:

1. Heat cramps is the least serious of the three heat-related illnesses. It usually occurs in individuals who sweat profusely during heavy work without replacing salt losses. Resting in a cool place and drinking water or an electrolyte drink will usually result in rapid recovery. Note: persons on a low-sodium diet should consult with a physician about what to do under these conditions.
2. Heat exhaustion is more severe than heat cramps and results from dehydration caused by failure to drink enough fluids, electrolytes, or both. An individual who is already experiencing heat exhaustion has the potential to develop heat stroke with additional exposure to a hot environment and without adequate rehydration. Heat exhaustion most often occurs in individuals with a low level of cardiovascular fitness or those not acclimatized to heat.
3. Heat stroke is the most serious of the heat illnesses and is a medical emergency. It is caused by the body's inability to regulate its core temperature. Sweating stops, and the body can no longer rid itself of excess heat. If an individual's deep body temperature approaches 106°F (41.1°C), heat stroke is likely. Heat stroke may be fatal unless treated promptly and adequately.

Minor heat-related conditions

- Heat syncope (fainting) may occur when unacclimated workers or students stand still in a hot environment. Fainting occurs due to blood pooling in the lower extremities, resulting in insufficient blood flowing to the brain.
- Heat rash (prickly heat) may occur in hot and humid environments when sweat cannot be easily removed from the skin by evaporation. When the skin remains wet most of the time, the sweat ducts become plugged and skin rash appears.
- Transient heat fatigue is a temporary state of discomfort, mental, or physiologic strain resulting from prolonged heat exposure. Unacclimated individuals can suffer to varying degrees, including a decline in task performance, coordination, alertness, and vigilance. Gradual heat acclimatization can ease the severity of transient heat fatigue.

Signs and symptoms of heat-related illness

Heat cramps causes painful spasms in one or more of the skeletal muscles, with legs, arms, and abdominal muscles being the most commonly affected. Tired muscles are more susceptible to heat cramps.

Heat exhaustion may be associated with clammy moist skin, extreme weakness or fatigue, nausea or vomiting, headache, dizziness or lightheadedness, low blood pressure, and normal or slightly elevated body temperature. Collapse can occur without immediate treatment.

Heat stroke may be associated with mental confusion, delirium, loss of consciousness, convulsions or coma, dry, pale skin with no sweating, or hot, red skin that looks sunburned, and an abnormally high body temperature (e.g., 41.1°C, or 106°F). Recognizing and treating heat stroke are ways to help prevent permanent brain damage or death.

Persons who have experienced previous heat injury are more susceptible to a subsequent injury and should be given more protection such as more frequent or longer rest periods.

Controls

Acclimatization for athletes is most important. When athletic directors or coaches prepare a training schedule for the new school year, a two-week period of adjustment should be added to front end of the training to allow athlete's bodies time to adjust to the environment and surrounding climate.

- Make sure that medical care and rescue personnel are available at the time of the workout and that they are familiar with symptoms and treatment of heat-related illness.
- A physician-supervised medical screening should be held for all athletes prior to participating in the program or a physician signed proof of screening should be provided by each participant.
- Athletes should be allowed a 10 to 14-day adaptation period. Workouts should increase in intensity and duration slowly and progressively.
- Coaches, trainers, and staff should make sure that athletes are educated in matching fluid intake with fluid loss. Maintaining proper hydration during hot weather while being physically active is an important strategy to helping prevent heat-related illness. Ensure water or other fluids are accessible to all participants and monitor hydration levels during training.
- Modify activity under high-risk conditions.
- Check environmental conditions before and during workout sessions and adjust or modify the session accordingly.
- Provide rest breaks to match environmental conditions.
- Make clothing adjustments to minimize the amount of clothing worn by athletes during hot or humid workout sessions.

It is important that schools and athletic camps have a heat policy worked into their outdoor athletic programs to address how they will approach the sport given different temperature levels.

Local jurisdiction, state high school athletic associations, NFHS (National Federation of State High School Associations), and NATA (National Athletic Trainer's Association) are a few organizations that can be helpful in establishing a heat policy for an organization or school.



The illustrations, instructions, and principles contained in the material are general in scope and, to the best of our knowledge, current at the time of publication. Our risk control services are advisory only. We assume no responsibility for: managing or controlling customer safety activities, implementing any recommended corrective measures, or identifying all potential hazards.

No attempt has been made to interpret any referenced codes, standards, or regulations. Please refer to the appropriate government authority for interpretation or clarification.

Insurance underwritten by Liberty Mutual Insurance Co. or its affiliates or subsidiaries.

© 2020 Liberty Mutual Insurance, 175 Berkeley Street, Boston, MA 02116.

libertymutualgroup.com/riskcontrolservices

12/19

RC 8036 R1