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UNH Exercise Experts Offer Advice on How to Avoid Heat Illness

By [Sharon Keeler](#)
UNH News Bureau
603-862-1460

August 6, 2001

Editors/News Directors:

With high school, college and youth athletic teams beginning fall practice, the following story regarding exercise and heat illness would be most timely. Robert Kenefick, UNH assistant professor of kinesiology, and Eric Swartz, UNH assistant professor of athletic training, are available for comment. You may reach Kenefick at 603-862-4859 or Swartz at 603-862-0018.

DURHAM, N.H. -- In light of the recent death of Minnesota Vikings football player Korey Stringer, coaches, athletic trainers, athletes and parents are being counseled about the serious medical complications that can result if they don't watch for signs of heat exhaustion and heatstroke.

The National Weather Service warns that sunstroke or heat exhaustion are likely when the heat index -- a combination of temperature and humidity -- tops 105°F. Heatstroke is possible with either prolonged exposure or physical activity, or both. It occurs when the body's core temperature rises uncontrollably, usually above 106°F.

"When temperatures rise, the body gains heat from the environment, plus you're generating heat from movement," says Robert Kenefick, University of New Hampshire assistant professor of kinesiology and an expert on environmental physiology. "The body dissipates that heat through sweating and evaporation. But evaporation is compromised by humidity, as well as by clothing and heavy equipment."

Without evaporation of sweat from the skin, the body's core is not cooled and temperature will rise. What results is increased sweating to cool the body. It is common for an athlete to lose up to a quart of fluid per hour while exercising in the heat, says Erik Swartz, UNH assistant professor of athletic training.

If fluids are not replaced during activity, there will be less fluid to sweat, and the body's temperature will rise to dangerous levels.

Kenefick and Swartz say the first sign of heat stress is thirst -- when you're thirsty, you're already dehydrated. Other signs include light-headedness, dizziness, headache, "prickly heat" or heat rash, nausea, vomiting, muscle cramping, profuse sweating, and rapid but weak pulse.

"It is recommended that athletes drink 6 to 8 ounces of water every 15 minutes, but this is hardly ever followed," says Kenefick. "In our research we have seen people lose 6 to 8 pounds in an hour -- all through sweat. You have got to replenish that water."

Kenefick says athletic trainers and coaches can monitor their players by measuring their body weight before and after workouts. Their weight should be the same when they return for practice the next session.

He also says it is important that people be well hydrated before exercise. Water is the best source, though sports drinks do encourage people to drink more. A good way to monitor proper hydration is to examine urine output - - the color should be nearly clear.

"It's interesting that humans don't naturally hydrate themselves properly," Kenefick says. "If you hold back water from animals, when they are allowed to drink, they will drink back all the fluid they lost. Humans won't, and that's why we need to pay attention."

Swartz agrees that unrestricted availability of water during exercise is key, as well as educating the coaching staffs and athletes on what symptoms to look for.

Definitions of Heat Exhaustion/Heatstroke and Treatment

Heat exhaustion -- a condition of extreme fatigue after prolonged exercise in the heat. A combination of lethargy and nervousness as well as a decrease in the ability to perform coordinated movements. They will have a rapid and weak pulse, and will be sweating profusely. May be treated by taking the athlete out of competition, taking them out of the sun and into the shade or indoors. Lie the athlete down, if possible, suspend in the air, and place fans around the athlete to circulate a cool air and increase heat dissipation from body. Moderate fluid intake of cool water.

Heatstroke -- a sudden onset of acute increase in core body temperature followed by the inability of the hypothalamus to regulate body temperature. Sweating ability may cease. Mental confusion, a decrease in the level of consciousness or unconsciousness will arise, and the skin will be hot and dry. Mortality rates of individuals suffering from heatstroke are approximately 20 percent. Core body temperatures are at a dangerous level; death occurs at temperatures more than 107°F. The athlete must be treated immediately to bring down body temperature. Remove from the sun and heat. Place ice bags over areas of increased blood flow such as the armpits, groin, and neck. Emergency services should be notified and transportation to the emergency room is necessary. Fluids should be given intravenously and a continual process of body cooling should be maintained while monitoring core body temperature through rectal thermometer. Ensure that a rebound hypothermia does not occur.

Advice for Preventing Heat Illness

1. The first step in sport participation regarding heat illnesses is to try and identify those athletes with a history of heat illness. There is a tendency of those with prior history of heat illness to be more susceptible to a recurrence of heat illness.
2. Coaches should be made aware of the dangers associated with athletic participation in the heat. Coaches have the primary responsibility of the athletes' safety, but it is the job of the athletic trainer to ensure that threatening situations are avoided. Proper education is the major component to prevention.
3. Coaches should be made aware that clothing plays a

large role in the athlete's ability to dissipate heat. No unnecessary clothing or equipment should be worn which would increase the chances of elevating body temperature. This is very important in sports such as football and lacrosse, when padding and helmets are worn. Helmets and padding act as insulation and decrease the overall surface areas of the skin from being exposed to the air for heat dissipation through sweating.

4. Regular breaks during practices should be used to allow the athletes a chance to keep the proper amount of body fluids regulated. It is recommended that there be a constant access to water for athletes without restraint, and they should be taught to drink often during a workout and to know the signs and symptoms of heat illness so they can also monitor themselves. Body weight measurements should be taken prior to and after practices and events.

5. Acclimatization -- athletes need to be physiologically adapted to participation in the heat through a gradual increase in athletic intensities. It is common for athletes to come into a pre-season unfit and unused to heavy exertion in the heat. This is a progression which should take at least 10-14 days, increasing intensity slowly.

6. Practice times should be scheduled as to avoid the most threatening times of the day. Conditions and times when the radiant heat is the most extreme, temperatures are high, no wind, and the humidity is the highest need to be considered.

7. Constantly monitor for signs of heat illness in all athletes throughout practices and through the day. Addressing heat stress before it progresses will prevent severe life threatening situations.

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