

Heatstroke: What Can a High School Coach or Teacher Do to Prevent It?

The Fear We All Have

It's your first day of football practice as the new coach, and you are excited about the numbers and talent in the turnout. It is hot and humid, but your first goal is to condition the players of varied athletic ability and experience—get them in shape, prepare them for the season, see what they're made of. Midway into your second practice of “two-a-day” practices, Johnny, a likeable, slightly overweight 16-year-old who is apparently struggling with conditioning drills, complains about “not feeling well.” You suspect that he did not report to practice in physically fit condition, and you encourage him to hang in there. While it is true that Johnny is not in good shape physically, he is actually suffering from early stages of heat exhaustion. Within minutes of returning to drills, he collapses. Despite your best prudent efforts and your immediate summoning of medical help, Johnny dies in the hospital five hours later from heatstroke.

John Gehring of the *Washington Post* refers to a finding from the National Center for Catastrophic Sport Injury Research. This organization reported that from 1995 to 2000 **nineteen football players** lost their lives in situations similar to the one just mentioned. More than three-quarters of those players were high-school students.

This issue came to national awareness in the summer of 2001 when 27-year-old Korey Stringer of the Minnesota Vikings died from heatstroke after engaging in voluntary post-practice conditioning drills. Gary Horton of *NFL Insider* pointed out that Stringer was in “the best shape of his life” at 336 pounds, which was eleven pounds under his previous year's weight. His death, which came fifteen hours after walking under his own power to an air-conditioned room before he collapsed, was particularly disturbing to us all. Stringer's death was the first on-the-field heatstroke fatality in the NFL's history. The NFL has had four other on-the-field deaths, but none of them were the result of heatstroke.

Stringer had reacted to the heat and had vomited three times on the day before his death. Yet it was not uncommon for him to get sick before games. Then just prior to his collapse on that fateful day, he even participated in extra conditioning because, it was thought, he wanted to take over leadership of the team. Stringer was known for playing with a lot of emotion and energy. He was a professional athlete under the

watchful eye of experienced trainers and coaches, and he had just finished a great practice. His situation is a reminder to all of us that the routine and familiar can become life threatening within moments. What responsibilities do we, as coaches and teachers, have in preventing the conditions that could lead to heatstroke?

What is Heat Stress?

Heat stress occurs in situations when environmental variables and physical factors placed upon a person begin to overwhelm the body's thermostat. According to *Bone: Pulmonary & Critical Care Medicine*, environmental variables "include temperature, sun versus shade, amount of breeze, and humidity." Physical factors "include body size, muscular development, fitness, intensity level of exercise, age, any recent illness, amount of fluid intake, and amount of rest."

It becomes difficult for the body to stay cool when it is subjected to many combinations of these factors, thus resulting in heat stress. Specifically, heat stress can be broken down into three levels of severity: **heat cramps**, **heat exhaustion**, and the life-threatening stage of **heatstroke**.

Heat Cramps are painful muscle contractions. These strong cramps are the body's warning system that a lack of fluids, a high-core body temperature, and possibly a lack of conditioning are catching up with the body. Heat cramps are usually not serious, and a little water, rest, and shade generally help alleviate them. But if ignored, heat cramps can quickly progress to the more serious condition of heat exhaustion.

Heat Exhaustion sets in when the body overheats following dehydration. The body temperature reaches the 102-degree mark. Dizziness, fainting, and sweating are characteristically common symptoms. Other symptoms include pale and clammy skin; rapid, weak pulse; intense thirst; more cramping; and fast, shallow breathing. At this point a physician should be consulted, and the athlete should be moved to a cooler place, given cold water, and instructed to lie down with his or her feet elevated.

Heatstroke is the most severe heat-stress condition. It is a life-threatening condition that is caused by an overexposure to excessive heat, which causes the body's thermostat system to shut down. The body temperature may rise to the 106-degree mark, and if it continues to climb to 108 degrees, as it did with Korey Stringer, death can be looming. Symptoms can include fainting or unconsciousness, loss of coordination, confusion, cessation of sweating, rapid pulse, and hot skin that is flushed. If these symptoms exist, call 9-1-1 and cool the athlete as much as possible.

What Is My Responsibility as a Coach or Teacher?

Of course, the best treatment of heatstroke is prevention. What are the expectations on me as a coach or teacher to prevent such an occurrence? A coach/teacher has a duty to ensure that instruction and supervision are adequate and proper, to select appropriate activities, and to screen participants. Our instruction and supervision need to be based on a standard of care that has an appropriate progression of instruction in a particular skill. There should be grouping by size, age, and skill level with activities that have clear objectives and planned rest and water breaks.

Participants should be screened as to their health status. The supervisor-to-athlete ratio should be at a number that is adequate to monitor the health status of each athlete. An emergency plan for heatstroke should be in place and practiced in advance. Athletes with injuries need to be cleared medically before reinstatement if medical attention was required initially.

What Can I Do?

Most heatstroke deaths are preventable. The first week of practice is the most dangerous period with out-of-shape players working hard in hot temperatures. You can:

- ❑ Phase athletes into the heat. Those who have not been in the heat recently are more susceptible to heat stress. It takes one or two weeks for people to adjust to a big temperature change, especially if they have been in air-conditioned environments.
- ❑ Know and monitor the heat-temperature guidelines for safe outdoor participation. There is a general rule that 90-degree heat begins to affect the body's ability to remove internal heat. A coach can use a device called a sling psychrometer (wet-bulb globe temperature). This device measures the temperature and humidity to help you determine the heat index (see chart). When the heat index is prohibitive for outdoor activity, practices need to be altered for duration and/or time of day. (The heat index the day Korey Stringer died was 110.)
- ❑ Maintain a file at the school showing that each athlete has received a physical prior to the first day of practice. The physical should be reviewed by the coach/teacher and/or school nurse or trainer for medical history and physical concerns. A list of athletes with medical concerns should be distributed to the coaching staff. Each coach needs to be aware of athletes with special medical concerns or particularly those athletes who are in poor shape.
- ❑ Advise your athletes to:

- Get plenty of sleep.
- Eat salty snacks.
- Avoid carbonated and/or caffeinated drinks.
- Avoid medications containing antihistamines.
- Drink water often, not waiting until they are thirsty. They need to drink before exercise and then drink 10 ounces for every 20 minutes of activity in hot weather.
- Wear light-colored and loose-fitting clothing.
- Wear sunscreen of SPF 15 or higher when practicing outdoors.
- Stop exercising if they begin to feel sick. (Four other Vikings complained of heat the day Korey Stringer died.)
- Require parents to report any serious health problems their student may have.
- Take more frequent breaks on particularly hot and humid days.
- Weigh athletes daily. Any player who loses more than three percent of his body weight should not be allowed to practice in hot and humid weather.
- Inform parents that serious or life-threatening health conditions can prevent participation in high-school athletics.
- Conduct trainer- or doctor-led seminars for coaches on recognizing heat-stress symptoms.
- Be sure that at least one adult in the outdoor training or play area has a cell phone to contact 9-1-1 if necessary.

Conclusion

This fall, a few million students will participate in high school athletics. Some of them will enter practices with conditions just right for developing heat stress.

Korey Stringer's death last summer is particularly disturbing to all of us. He was reportedly in excellent shape. He was practicing under the supervision of a skilled training team and in a facility we could only wish was ours. His situation serves as a reminder that total prevention of heatstroke is hard to do. But we, as coaches/teachers, do have the responsibility to be informed, to be vigilant, and to exercise due care in preventing the conditions that can lead to a life-threatening heatstroke.

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Article references are available by contacting ACSI*