

# How to keep teen athletes safe from heat illness as sports practice begins amid a brutally hot summer

August 2 2022, by Susan Yeargin

## Heat safety guidelines from the Korey Stringer Institute

The Korey Stringer Institute, named for a Minnesota Vikings player who died of heat stroke in 2001, shares these guidelines for wet bulb globe temperatures in different parts of the U.S.

Cat. 3	Cat. 2	Cat. 1	Activity guidelines
<82°F	<79.7°F	<7.1°F	Normal activities – Provide at least three separate rest breaks each hour with a minimum duration of 3 minutes each during workout.
82.2-89.9°F	79.9-84.6°F	76.3-81°F	Use discretion for intense or prolonged exercise; provide at least three separate rest periods each hour with a minimum duration of 4 minutes each.
87.-90°F	84.7-87.6°F	81.1-84°F	Maximum practice time: 2 hours. For football, restrict players to helmet, shoulder pads and shorts during practice. For all sports, provide at least four separate rest breaks each hour with a minimum duration of 4 minutes each.
90.1-91.9°F	87.8-89.6°F	84.2-86°F	Maximum practice time: 1 hour. For football, no protective equipment during practice, and no conditioning activities. For all sports, provide at least 20 minutes of rest breaks distributed through the practice.
>92°F	>89.9°F	>86.1°F	No outdoor workouts. Delay practice until a cooler wet bulb globe temperature is reached.

*Category 1 includes most of New England, states bordering Canada, and the Rockies. Category 3 generally includes states south of Pennsylvania, Ohio, Iowa and Kansas plus most of New Mexico, Arizona and California's Central Valley. Category 2 is in between.*

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High school sports practices are starting amid a brutally hot summer in much of the country. As temperatures rise, heat illnesses are becoming an increasing risk for athletes, particularly in the first few weeks of practice. We asked [Susan Yeargin](#), a co-author of the National Athletic Trainers Association's [position statement on heat illness](#), to explain the risks and what coaches and players need to remember to keep kids safe.

**Why are athletes particularly vulnerable to heat during the first few weeks of training?**

**When an athlete of any age begins to exercise or train for a sport in hot conditions, the body needs time to adapt. In a natural outdoor environment, this is called heat acclimatization.**

**In the first three days of heat exposure, the body hasn't started to adapt, which is why those are [the riskiest days](#) for [heat illness](#). Most acclimatization happens by the 10th day, but it takes [about two weeks](#) for the body to reach its peak heat acclimatization.**

**The most important change within the body is [plasma volume expansion](#), giving the body more blood to help dissipate heat and supply exercising muscles. In short, it allows the cardiovascular system to work more efficiently.**

**The [rate of sweating](#) also increases, allowing more heat to dissipate from the body. The body increases its retention of salt, which is good because it allows for better electrolyte balance within the body to maintain hydration and keep muscles working optimally. The heart rate decreases, so there is less strain on the cardiovascular**

system. And the core body [temperature](#) decreases, representing a lower risk for exertional heat stroke.

But even with all of these adaptations, the body isn't fully protected from heat illness, which is why other prevention strategies are needed.

Also, just because athletes have been training over the summer doesn't mean they are fully adapted to heat under the conditions that a sport season imposes. The sports season brings new exercise intensity, often higher heat than earlier in the summer, and heavier equipment, like pads and helmets, and an increased pressure to perform.

**At what point do temperatures start getting dangerous for young athletes?**

That [varies across the country](#). Athletes who live in milder climates should not be practicing in [environmental conditions](#) over 86.2 degrees Fahrenheit (30.1 degrees Celsius), based on [wet bulb globe temperature](#). For those in traditionally hotter climates, like Texas, the recommended cutoff temperature for canceling practice is 92 F (32.2 C).

The risk is about more than the temperature—it's also about humidity, sun and wind. Humidity hinders sweat evaporation, the body's primary heat dissipation mechanism. So when humidity is high, no matter the air temperature, that creates a heat safety concern.

Athletic trainers often use wet bulb globe temperature—which takes all four of those variables into account—to determine when

teams should shorten or cancel practice and how often rest and cooling breaks should be required. It's a better gauge of risk than the heat index, which uses only air temperature and humidity.

Anyone can check their area's projected wet bulb globe temperature using a [National Weather Service](#) website.

## How can you tell when someone is suffering from heat illness?

There are several conditions that fall within the realm of "heat illnesses," but these are the primary ones:

- Heat cramps, also referred to as exercise-associated [muscle cramps](#), are caused either by dehydration and electrolyte losses or tired muscle groups. They're easy to spot when a muscle group tightens and knots. Heat cramps can typically [be treated with](#) rest, stretching and hydration with electrolytes. If someone is complaining of cramps but the muscles are not knotted and tight to the touch, then that person could be experiencing [an emergency condition](#) related to sickle cell trait called exertional sickling.
- [Heat exhaustion](#) can occur when a person is dehydrated and exercising in warm conditions. Eventually, the body is unable send enough blood to both the working muscles and the skin for heat dissipation. It will prioritize the heat dissipation, and the person either collapses or can't continue exercising. This should be treated by placing the person in shade or [air conditioning](#), giving them something to drink, and cooling them with fans or cold towels. If they don't respond quickly, they may need medical attention.
- [Exertional heat stroke](#) is a medical emergency in which a

person's body temperature is over 105 F (40.6 C). Unfortunately, traditional temperature devices like oral and forehead thermometers don't measure body temperature accurately in these situations. If a person has been exercising in warm conditions and their personality changes, they start acting weird or different or become confused, you should suspect exertional heat stroke. First responders should place the heat stroke victim in a cold water immersion tub up to their shoulders and make the water as cold as possible with ice. If that's not available, any kind of water immersion like a baby pool, creek, tarp filled with water, or dousing should be used. EMS should be called immediately.

An important clue in all of these [heat](#) illnesses is that the person is almost always sweating. It is a myth that the person will stop sweating; this rarely happens.

**What do athletic trainers recommend for keeping athletes safe in the heat, particularly in those first weeks?**

Teams should follow [heat acclimatization guidance](#) to gradually increase the length of training sessions and the intensity of workouts. For example, an expert group that reviewed research on youth sports [recommended always keeping training or practice sessions under two hours](#) and only once a day in the first week. Conditioning, such as repetitive running and timed drills, should be held in an air-conditioned area or not integrated for the first two weeks.

In addition, teams should pay attention to [wet bulb globe temperature](#) tables for their part of the country and avoid exercising in the

**hottest part of the day, generally 10 a.m. to 6 p.m.**

**The [National Athletic Trainers Association](#) also recommends: using "[weight charts](#)" to help players understand how much they need to drink to stay hydrated; having on-site [athletic trainers](#) with treatment resources, such as cold-water tubs; encouraging good sleep and nutrition; and providing a safe work-to-rest ratio during conditioning and practice sessions. Breaks should be in the shade, ideally with cooling devices such as fans, misters and cold towels. If a hard or intense drill is completed, players should have an equally long break.**

**A buddy system is also beneficial. With a buddy, someone is more likely to notice when an athlete isn't feeling well or is starting to act out of character and needs to be stopped for evaluation.**

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