



# Heat Illness in Young Athletes: Detection and Prevention

With the end of the school year and the beginning of summer, many kids will be spending more time outdoors playing sports. Some kids will be engaged in recreational activities, or free-play, while many others will be competing for a team or club. Still more kids will attend various camps such as cheerleading, basketball, football or marching band, to name a few. Regardless of the sport, outdoor summer activities in the south have one thing in common; **the heat**.

Heat related illness is responsible for thousands of summertime emergency room visits annually by young athletes. The severity of heat injury ranges from mild heat cramps to heat stroke and death. In fact, heat stroke is the third most common cause of exercise-related death in US high school athletes. But there is one important fact to remember, heat related illness is **preventable**. With some basic knowledge about thermoregulation and hydration in young athletes, and how to recognize the early signs of heat injury, one can drastically reduce the risk of suffering heat-related illness.

-Kids generate more heat during exercise than adults.

-Kids have less blood volume per pound of body weight. Therefore, they have limited ability to shunt blood to the skin for sweating and evaporative cooling, the most efficient way the body cools itself during exercise. This decreased blood or fluid volume also puts kids at increased risk for dehydration.

-Kids initiate sweating later during exercise than adults.

-Kids have a larger surface area to mass ratio and are closer to the ground than adults. Therefore, they more readily absorb radiant heat from the ground and pavement, raising their body temperature faster.

-Kids take longer to acclimate to higher temperatures and humidity than adults. Children who are new to the south or out of shape should exercise for shortened, less intense sessions 3-4 times per week for 2 weeks to allow their bodies and thermoregulatory response to acclimate.



## Hydration Tips for Young Athletes

-**Never** rely on thirst. Thirst is a poor indicator of hydration status. When a young athlete begins to feel thirsty, he or she may already be 1%-2% dehydrated.

-Prehydrate. 30 minutes before activity, drink till you are no longer thirsty **plus another 8 ounces**. For kids weighing less than 90 pounds, drink 5 ounces every 20 minutes of activity. For kids weighing more than 90 pounds, drink 8 ounces every 20 minutes.

-Water is best if the activity lasts one hour or less. For activities lasting more than an hour, you should drink a fluid with carbohydrate (sugar) and electrolytes. Drinks such as Gatorade and Powerade were designed specifically for re-hydration during exercise and contain the right amount of carbohydrates, about 6%-8%. Fluids with too much sugar such as fruit juice and soda contain too much sugar and can cause cramping. Kids younger than 10 years old may dilute a sports drink 1:1 water for a better taste. Avoid carbonated and caffeinated beverages because the carbonation and make you feel bloated and caffeine can speed up metabolism, generating more heat.

-Drink it, don't pour it. Pouring cold water on your head or face may feel great, but it does not improve your hydration status.

## **General Tips for Exercising in the Heat**

- Schedule workouts for the cooler times of the day.
- Allow overweight, out of shape or unacclimated kids time to acclimate to the heat.
- Schedule timed water and rest breaks every 30 minutes during activities. During these breaks, don't just encourage, but **require** kids to drink. This also gives the coach or trainer a chance to monitor the athletes.
- Have shade, ice, and a kiddie pool available for emergency treatment and rapid cooling, if needed.
- Have a cell phone (with a charged battery) available at all workouts for emergency contact.
- Wear sunscreen with an SPF of at least 15. Apply it 30 minutes before going out in the sun and every 20-30 minutes if sweating or swimming.
- Wear hats with brims and light colored, breathable clothing, if possible
- Remember youth sports rules are not carved in stone and can be modified to increase the safety of athletes. For example, soccer games can be divided into 4 quarters rather than 2 halves to allow for more natural breaks for rest, hydration, and monitoring. Referees can call an "official time out" for hydration periodically during the game, similar to the "TV time out" seen in college and the pros.

## **Recognize the early signs of heat illness**

Thirst, fatigue, dizziness, light-headedness, muscle cramps, and loss of energy may be signs of dehydration. The athlete should stop activity, and drink water or a sports drink. Muscle cramps can be stretched and lightly massaged. Resume activity with caution **only when all symptoms have cleared.**

### **Heat Exhaustion**

Dizziness, rapid pulse, headaches, nausea, vomiting, chills, and loss of coordination may be signs of heat exhaustion. The athlete may be sweating profusely or the skin may be dry. Activity should be discontinued and the athlete should be rehydrated. If their level of consciousness does not allow oral hydration, then they must be transported to a medical facility for IV hydration. Core body temperature should be measured with a rectal probe. If this is not available, then the athlete should be transported to a medical facility for hydration and monitoring.

Confusion, irrational behavior, drowsiness, nausea, vomiting, and a dangerously high temperature (104 and above) may be signs of heat stroke. This is a life-threatening medical emergency that requires rapid cooling by immersion in an ice bath. Ice bags on the neck, groin, and under the neck may help if a bath is unavailable. 911 should be called immediately.

Remember that humidity plays a major role in thermoregulation in athletes young and old. Be aware of the heat index which is a measure of the environmental temperature and humidity. This can be measured on the field with an instrument called a sling psychrometer or can be obtained from the weather channel or on the Internet. When the temperature is 90 degrees F and the humidity is 80%, the heat index is 115 degrees, which places athletes at risk of suffering a heat-related injury.

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**Children's Healthcare of Atlanta** Sports Medicine Program is ranked No. 3 among the top five pediatric orthopaedic programs in the nation by *Child* magazine. The program offers medical and orthopaedic services for student-athletes at the elite, collegiate, high school and middle school levels.