



SOUTH CAROLINA HIGH SCHOOL LEAGUE

Heat and Acclimatization Guidelines

Exertional Heatstroke (EHS) is the leading cause of preventable death in high school athletics. Student-athletes participating in high-intensity, long-duration, or repeated same-day sports practices and training activities during the summer months or other hot-weather days are at greatest risk.

All schools are **required** to use a 1) scientifically approved on-site Wet Bulb Globe Thermometer (WBGT), 2) cold immersion tub or other effective cooling devices, and 3) have a venue-specific Emergency Action Plan in place as primary prevention strategies for EHI. Schools must follow the SCHSL Pre-Season Acclimatization Plan.

1. Recognition of Heat Illness:

a. Heat Exhaustion

- i. Definition: The inability to continue exercise in the heat because of cardiovascular insufficiency
- ii. The clinical criteria for heat exhaustion generally include the following:
 1. The athlete has obvious difficulty continuing with exercise
 2. Body temperature is usually 101 to 104°F (38.3 to 40.0°C) at the time of collapse or need to drop out of activity.
 3. No significant dysfunction of the central nervous system is present (e.g., seizure, altered consciousness, persistent delirium)
 4. Has the absence of any other potentially life-threatening condition (i.e. cardiac arrest, diabetic emergency, head trauma etc.)
- iii. If any central nervous system dysfunction develops, such as mild confusion, it resolves quickly with rest and cooling.
- iv. Patients with heat exhaustion may also manifest:
 1. Tachycardia (very fast heart rate) and weak pulse
 2. Extreme weakness

3. Dehydration and electrolyte loss
4. Ataxia (loss of muscle control) and coordination problems, syncope (passing out), light-headedness
5. Profuse sweating, pallor (paleness), “prickly heat” sensation
6. Headache
7. Abdominal cramps, nausea, vomiting, diarrhea

b. Heat Syncope

- i. Definition: A sudden orthostatic hypotension experienced in the heat
- ii. Three primary causes of being in the heat
 1. A sudden cease in exercise
 2. A sudden standing up after sitting
 3. Prolonged standing with no muscle contractions
- iii. Signs and Symptoms
 1. Dizzy
 2. lightheaded
 3. Fainting
 4. Malaise

c. Exertional Heat Stroke

- i. Definition: EHS is a medical emergency involving life-threatening hyperthermia with concomitant central nervous system dysfunction that requires the immediate recognition and implementation of the EAP
- ii. The two main criteria for diagnosing exertional heat stroke
 1. Rectal temperature above 104.9°F (40.5°C), measured immediately following a collapse during strenuous activity.
 2. Central Nervous System (CNS) Dysfunction
- iii. CNS Signs and Symptoms (not all symptoms need to be present, just one can be an indication of EHS):
 1. Irritability
 2. Dizziness
 3. Headache
 4. Nausea
 5. Confusion
 6. Loss or altered consciousness
 7. Emotional instability
 8. Irrational behavior
 9. disorientation

2. Wet Bulb Globe Temperature (WBGT) considers the combined effects of air temperature, humidity, and solar radiation on the human body.

- a. A scientifically approved WBGT thermometer should be on site and utilized. Do not rely on local weather updates or weather apps as they do not provide an accurate reading for your specific venue.
- b. Readings should be taken directly on the playing surface 30 minutes before activity and taken every 30 minutes after. NOTE: Phone apps are not scientifically approved at this time.
- c. WBGT devices must be recalibrated every two years or earlier if recommended by the manufacturer.
- d. If WBGT is at 92.1 or above, suspend/postpone practice/competitions.
- e. **For Practice:**
 - i. WBGT should be accessed every 30 minutes beginning 30 minutes before the start of practice
 - ii. Once the WBGT reading has stayed in a range for 15 minutes, practice restrictions for that range are in place and cannot be lowered to a lower range.
 - iii. If the WBGT reading reaches a higher reading and stays in that reading for 15 minutes, practice restrictions are in place for the new range and cannot be lowered to a lower range. Time frames associated with the new category cannot be added cumulatively to have already occurred.
 - iv. There will be no outdoor activities when the WBGT is >92.1.
- f. **For competitions:**
 - i. During warmups, in football, athletes should remove their helmets and shoulder pads when the WBGT >87.
 - ii. If WBGT is above 87.0 and below 92.1 at kick-off, there will be a mandatory hydration break at the halfway point of each quarter lasting three minutes. Players should remove their helmets and be given access to unlimited water.
 - iii. In all sports, if the Wet bulb is over 92.1, postpone the competition until the wet bulb is below 92.1

3. Guidelines for the Modification of Athletic Competition in Hot or Humid Environments

WBGT READING	ACTIVITY GUIDELINES & REST BREAK GUIDELINES
Under 82.0	Normal activities - Provide at least three separate rest breaks each hour of minimum duration of 3 minutes each during the workout
82.0-86.9	Use discretion for intense or prolonged exercise; watch at-risk players carefully; Provide at least three separate rest breaks each hour of a minimum of 4 minutes duration each
87.0-89.9	Maximum practice time is two hours. For Football: players restricted to helmets, shoulder pads, and shorts during practice. All protective equipment must be removed for conditioning activities. For all sports: provide at least four separate rest breaks each hour of a minimum of 4 minutes each
90.0-92.0	Maximum length of practice is one hour, no protective equipment may be worn during practice, and there may be no conditioning activities. There must be 20-minutes of rest breaks provided during the hour of practice. Competitions involving high intensity effort, in which breaks are not possible (e.g. Cross Country meets), should be delayed until WBGT reading is below 90 or canceled.
Over 92.1	No outdoor workouts; Cancel exercise; delay practices until a cooler WBGT reading occurs

For swimming: The air temperature and water temperature when added together should not be less than 118°F or greater than 177.4°F

**Supported by 2023 USA swimming and USA Triathlon rules.*

4. Management of Heat Illness:

a. Exertional Heat Stroke

- i. All sports that participate outdoors should have immediate access (i.e. all supplies ready to use) to a cold immersion tub or other method that uses water (taco immersion technique) when the WBGT is 82 or greater. Cold water immersion should typically be available from May through October.
- ii. The primary goal of the management of EHS is to reduce core body temperature as quickly as possible. When exertional heat stroke is suspected, immediately initiate cooling, and then activate the emergency medical system. Remember “Cool First, Transport Second”.
 1. Remove all equipment and excess clothing.

2. Cool the athlete as quickly as possible within 30 minutes via whole body ice water immersion (place them in a tub/stock tank with ice and water approximately 35–58°F); constantly stir water and add ice throughout the cooling process.
 3. If immersion is not available, use of another method that uses water should be the next priority. This can include water and inside a tarp (aka TACO method), a baby pool with water in which the torso and hip can fit, cold towels with constant shower or hose dousing occurring at the same time
 4. Maintain airway, breathing, and circulation.
 5. After cooling has been initiated, activate the emergency medical system by calling 911.
 6. Monitor vital signs such as rectal temperature, heart rate, respiratory rate, blood pressure, monitor CNS status.
 - a. If rectal temperature is not available, **DO NOT USE AN ALTERNATE METHOD** (oral, tympanic, axillary, forehead sticker, etc.). These devices are not accurate and should never be used to assess an athlete exercising in the heat.
 7. Cease cooling when rectal temperature reaches 101–102°F (38.3–38.9°C).
 8. Do not transport until rectal temperature is confirmed to be below 102F.
 9. If rectal temperature is not available to guide treatment time, the clinician should use the body size of the athlete, how much of the body is covered by water, and how cold the water is to decide treatment time. The use of shivering, or return of CNS function, alone is not recommended.
- iii. Optimally, the best practices should be carried out by a certified athletic trainer or a designated healthcare professional. In the event one of these healthcare professionals is not available, the cooling technique should be implemented by the school personnel until EMS arrives.

Note: Exertional heat stroke has had a 100% survival rate when immediate cooling (via cold water immersion or aggressive whole-body cold water dousing) was initiated within 30 minutes of collapse.

b. Heat Exhaustion and Heat Syncope

- i. The athletes should be removed from activity and placed in shaded or air-conditioned environment while seated or laying down
- ii. If tolerated, the athletes should be given a fluid to drink as desired (chugging is not needed)
- iii. If available, a salty food should be given (i.e. pretzels)
- iv. Superficial cooling is recommended for comfort and to encourage blood return back to the heart. This can done with fans, ice bags, or cold towels

5. Prevention of Heat Illness:

1. Heat Acclimatization
 - a. Adhere to the SCHSL heat acclimatization plans
2. Guidelines for Hydration and Rest Breaks
 - i. Rest time must involve unrestricted access to fluids (cold water or electrolyte beverages)
 - ii. With sports requiring helmets, the helmets must be removed during rest time
 - iii. The site of the rest time should be in a shaded area
 - b. Provide unlimited drinking opportunities during hotter practices. NEVER withhold water from athletes.
 - c. Hydration Recommendations
 - i. To ensure hydration, athletes can observe the color of your urine, which should be a light yellow or the color of lemonade
 - ii. Measure the athletes' weight before and after each practice to ensure they do not lose more than 2% of their pre-workout weight, assuming they started in a hydrated state. Use the equation: $(\text{Pre-exercise weight} - \text{post-exercise weight}) / \text{pre-exercise weight} \times 100$. By the time next practice begins, athletes should ingest fluids and weigh the original weight. This equation assumes that they do not eat, drink or go to the bathroom during practice.
 - iii. Encourage drinking throughout practice, in the shade if possible, and throughout the day, especially when having multiple practices.

- iv. As they become used to exercising in the heat they will sweat more and therefore need to replace a greater amount of fluids during the course of the workout.
 - v. Encourage drinking both water and fluids containing sodium.
3. Additional Recommendations
- a. Coach and other key stakeholders should work together to ensure work to rest ratios are appropriate for all WBGT categories
 - b. Exercise should never be used as punishment especially repetitive drills that encourage core body temperatures to increase significantly.
 - c. Wear loose-fitting, absorbent or moisture-wicking clothing
 - i. During hot or humid conditions minimize the amount of equipment and clothing worn.
 - d. Sleep at least 6–8 hours and eat a well-balanced diet.
 - e. Practice and perform conditioning drills at appropriate times during the day, avoiding the hottest part of the day (10am–5pm).
 - f. Work with coaches and administration to follow acclimatization guidelines.
 - g. Slowly progress the amount of time and intensity of conditioning and practices throughout the season.
 - h. Ensure that proper medical coverage is provided and familiar with exertional heat illness (EHI) policies.
 - i. Be aware of the intrinsic factors (mostly in your control/items you can adjust) and extrinsic factors (mostly outside your control) that cause EHS