Boston Crusaders Policies: Heat & Hydration

Heat Index

Boston Crusaders medical team shall document heat index by use of wet bulb thermometer and shall make recommendations to administration and staffing relative to specific heat index concerns, cumulative heat index concerns, and best practice for time management during instances of high heat index measurements.

Heat Policy

Signs & Symptoms of Heat-Related Injuries

Exercise- associated muscle cramps ● Intense pain/cramping ● High sweat rate ● Dehydration/Thirst ● Fatigue	Heat Syncope ● Dizziness/lightheadedness/syncope ● Fatigue ● Tunnel vision ● Pale, sweaty skin ● Bradycardia (<60 bpm)
Exercise (heat) exhaustion ● Core temp (97.0 – 104.0F) ● Dehydration ● Dizziness/lightheadedness/syncope ● Headache ● Nausea ● Intestinal cramps/diarrhea ● Profuse sweating ● Cool, pale, clammy skin	Exertional heat stroke ● Core temp (> 104.0F) ● Dizziness ● Irrational behavior ● Confusion/disorientation ● Altered level of consciousness ● Hot skin ● Tachycardia (100-120 bpm) ● Hypotension ● Hyperventilation ● Vomiting
Exertional hyponatremia ● Core temp (< 104.0F) ● Excessive fluid consumption ● Nausea ● Vomiting ● Swelling of extremities ● Progressive headache ● Confusion/disorientation ● Altered level of consciousness	Exertional sickling ● Muscle cramping ● Pain ● Swelling ● Weakness ● Inability to catch one’s breath ● Fatigue

Assessing Core Temperature

Assess the individual to determine nature and degree of illness. Use of a rectal thermometer is the most accurate method of accessing core temperature and allows for differentiation between many of the similar sign & symptoms between heat-related injuries. Core temperature should be assessed rectally in all circumstances where the personnel and necessary equipment are available. Because immediate treatment is vital in exertional heat stroke, it is important to not waste time by substituting an invalid method of temperature assessment if rectal thermometry is not available. Instead, the practitioner should rely on other key diagnostic indicators (ie, CNS dysfunction, circumstances of the collapse). If EHS is suspected, CWI (or another rapid cooling mechanism if CWI is not available) should be initiated immediately.

Management of Heat-Related Injuries

Activate EMS by calling 9-1-1 from a cell phone.

Medical team duties:

1. Determine if EMS needs to be activated. If so, designate another individual to activate the EAP.
2. Treat the individual according to current medical practices per table below
3. Ensure notification of physician (if not present).

Any patient who is treated for a heat-related illness MUST follow up with a physician for clearance PRIOR to returning to activity.

Exercise-associated muscle cramps ● Replace lost fluids w/ high sodium drink ● Mild stretching & massage ● Consider IV fluids	Heat syncope ● Move athlete to shaded area ● Monitor vital signs ● Elevate legs above head ● Rehydrate
Exercise (heat) exhaustion ● Measure core temp w/ rectal thermometer ● Remove excess clothing ● Cool athlete w/ fans, ice towels, or ice bags if temp > 102F ● Consider referral to physician if recovery is not rapid	Exertional heat stroke ● Activate EMS ● Measure core temp w/ rectal thermometer if available ● Assess cognitive function ● Lower core temp to 102F within 30 minutes of collapse (cold water immersion 35 – 59F) ● EMS transport
Exertional hyponatremia ● Rule out heat stroke and heat exhaustion ● Differentiate from heat stroke w/ core	Exertional sickling ● Administer oxygen with nonrebreather mask at rate of 15L/min ● Monitor vital signs

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temp (should be < 104F) ● Treatment with IV fluids	● Consider referral to physician or activation of EAP if vital signs decline or recovery is not rapid ● Sickling collapse should be treated as a medical emergency

Exertional Heat Stroke Protocol:

1. Initial response. Once exertional heat stroke is suspected, prepare to cool the patient and contact emergency medical services.
2. Prepare for ice-water immersion. On the playing field or in close proximity, half-fill pool with water and ice (make sure there is a sufficient water source). Tub should be under medical tent or in shaded area.
    a. The tub can be filled with ice and water before the event begins (or have the tub half-filled with water and keep 3 to 4 coolers of ice next to the tub; this prevents having to keep the tub cold throughout the day)
    b. Ice should cover the surface of the water at all times.
    c. Water hose can be used to douse patient.
    d. Ice packs and ice towels can also be used to cover whole body or minimally neck, armpits, and groin.
3. Determine vital signs. Immediately before immersing the patient, obtain vital signs.
    a. Assess core body temperature with a rectal thermometer, if possible.
    b. If rectal temperature is not available, use other key diagnostic indicators (ie. CNS dysfunction, circumstances of collapse)
    c. Assess the level of central nervous system dysfunction.
    d. Check airway, breathing, pulse, and blood pressure.
4. Begin ice-water immersion. Place the patient in the ice-water– immersion tub. Medical team, staff, and volunteers may be needed to assist with entry to and exit from the tub.
5. Total-body coverage. Cover as much of the body as possible with ice water while cooling.
    a. If full-body coverage is not possible due to the tub size, cover the torso as much as possible.
    b. To keep the patient's head and neck from going under water, an assistant may hold him or her under the armpits with a towel or sheet wrapped across the chest and under the arms.
    c. Place an ice/wet towel over the head and neck while body is being cooled in the tub.
    d. Use a water temperature under 60F
6. Vigorously circulate the water. During cooling, water should be continuously stirred to enhance the water-to-skin temperature gradient, which optimizes cooling. Have an assistant stir the water during cooling.

7. Continue medical assessment. Vital signs should be monitored at regular intervals (every 5 to 10 minutes).
8. Fluid administration. If a qualified medical professional is available, an intravenous fluid line can be placed for hydration and support of cardiovascular function.
9. Cooling duration. Continue cooling until the patient's rectal temperature lowers to 102F.
    a. If rectal temperature cannot be measured and cold-water immersion is indicated, cool for 10–15 min and then transport to a medical facility
    b. An approximate estimate of cooling via cold-water immersion is 1F for every 3 min (if the water is aggressively stirred).
10. Patient transfer. Remove the patient from the immersion tub only after rectal temperature reaches 102F and then transfer to the nearest medical facility via emergency medical services as quickly as possible. On site physician can clear patient if cooling occurred within 30 minutes of collapse.

Return to Play after Exertional Heat Stroke

There are currently no evidence-based guidelines concerning the proper return to play progression after suffering from exertional heat stroke. The following are the most recent guidelines published:

1. Refrain from exercise for at least 7 days following release from medical care
2. Follow up in about 1 week for physical exam and repeat lab testing or diagnostic imaging of affected organs that may be indicated, based on the physician's evaluation
3. When cleared for activity, begin exercise in a cool environment and gradually increase the duration, intensity, and heat exposure for 2 weeks to acclimatize and demonstrate heat tolerance
4. If return to activity is difficult, consider a laboratory exercise-heat tolerance test about one month post-incident
5. Consider clearance for full competition if heat tolerance exists after 2-4 weeks of training

Hydration Guidelines:

According to the Korey Stringer Institute, an appropriate hydration strategy involves athletes to begin exercise hydrated, minimize fluid losses during exercise, and then replace fluid losses after exercise. Hydration needs are individualistic, so athletes should be aware of their own hydration needs to maximize performance and safety.

Dehydration is influenced by exercise intensity, environmental conditions (temperature and humidity), and availability of fluids during exercise. Once an individual loses 2% of their body mass from fluid losses impairments in performance are noticeable and these impairments become more extreme with greater levels of dehydration.

Signs of dehydration:

- **Urine Color** – Urine color can be assessed and compared with the urine color chart (as seen to the right). This is the easiest measure of hydration for most people because it is easy to assess and does not need additional equipment to do so. The higher the number or darker the color the greater degree of dehydration.
- **Sensation of Thirst** – Thirst develops once dehydration has already set in (~1-2% of body mass loss) and is considered to work best during rest

Sports drinks, or drinks containing carbohydrates (CHO) and electrolytes, and supplements (including sodium, potassium, and magnesium) can be used in addition to water for rehydration purposes, especially during intense exercise in the heat lasting longer than 60 min. Supplementations should be given via the medical team's discretion.

Hydration during event - The rule-of-thumb is to consume about 7 oz (200-300ml) of fluid every 10-15 minutes during rehearsals.

Rehydration should occur within 2 hours post exercise to assure optimal rehydration.

Things to avoid to maintain hydration status:

- Caffeine
- Sweet liquids

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https://ksi.uconn.edu/prevention/hydration/#

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