

“Exertional Heat Illness” Emergency Action Plans, Policies and Procedures/ the Gold Standard of Care

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Disclosures

I have no disclosures to report!!

Where do we start?

- Identify the condition/ signs & symptoms
 - The two main diagnostic criteria for exertional heat stroke are profound central nervous system (CNS) dysfunction and a core body temperature above 105°F.
- Follow the established protocol
- Enact the plan!!
- **Sounds simple but:**

It's not as simple as it appears!

- Not all EHS cases are easily identifiable!
- Is there a complete medical history on the patient?
- Are all the signs and symptoms consistent with EHS?
- Is the location of the incident the site where you expected to practice or play ? (Last minute change in venue, etc.)

It's not as simple as it appears!

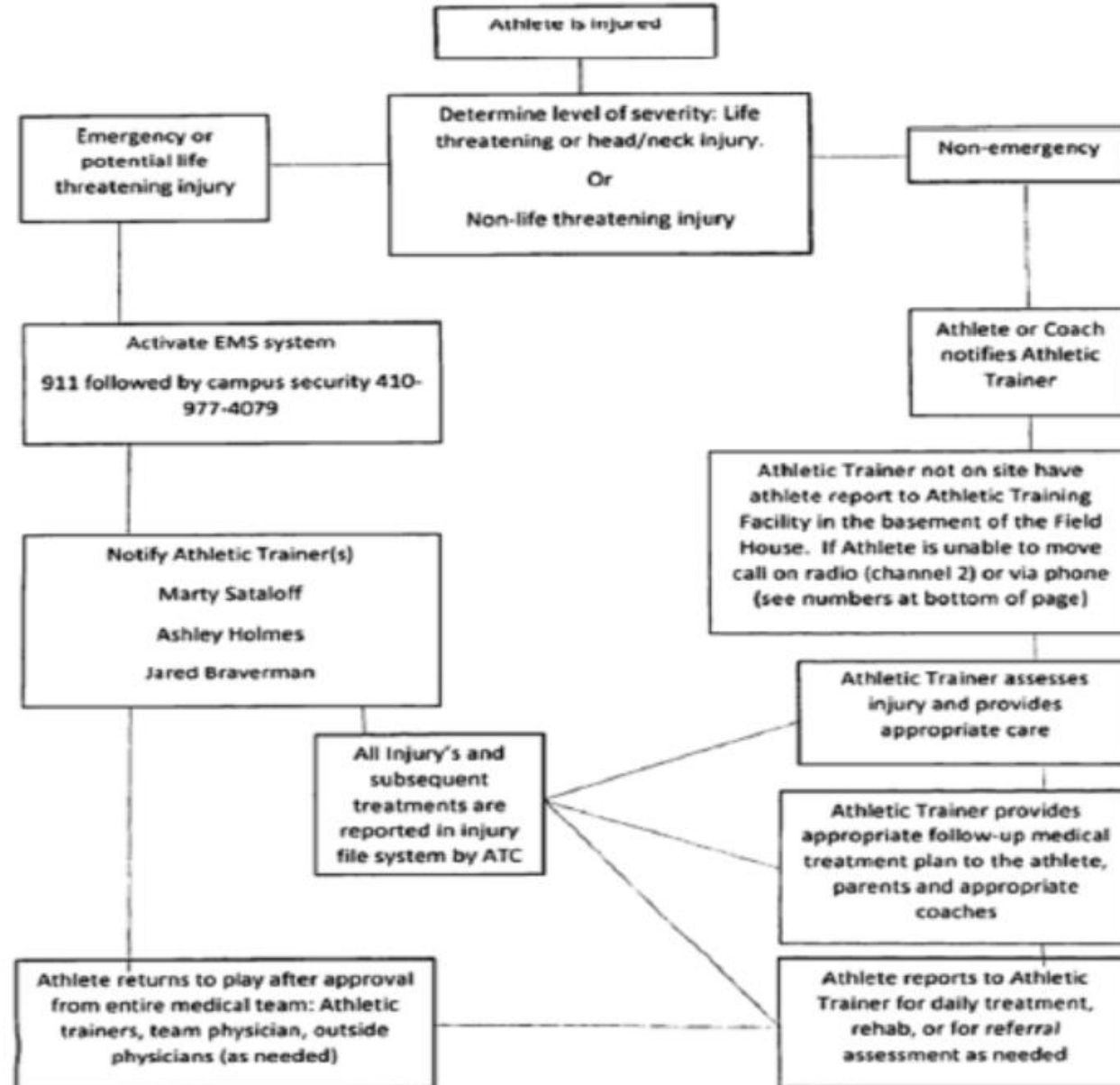
- Are there trained staff available to assist in the situation?
- Is the communication system in place and functioning?
- Is there easy access to the facility for EMS to respond?

It's not as simple as it appears!

- When traveling with a team, will there be all necessary equipment in place in the event of an EHS crisis?
- When traveling, who's duty is it to determine if the host team has made arrangements for the possibility of an EHS crisis?
- Is there a pre-game planning meeting to review duties and responsibilities prior to competition?
- If playing at a neutral site who is responsible for having an immersion tank or other means of appropriate cooling in place if the need arises?

**Have an established chain of
command and response protocol !**

McDonogh School Injury Response Protocol



Policies and Procedures

- You must have a clearly written Policy and Procedure document that has been shared with administrators and reviewed by staff. These Policies must be reviewed annually with updates as needed based upon “Best Practice” information.
- It is imperative that policies regarding the care and treatment of athletes is clearly stated and the procedures established are followed.

Policies and Procedures

- Once a plan is laid out it must be followed unless mitigating factors make it impossible.
 - Any changes in the plan must be documented!
- Policies must be in sync with the established Emergency Action Plan.
- All members of the care team must understand their individual duties and accept their roles.
- Practice and training for the management of an Exertional Heat Stroke crisis is necessary.

Policies and Procedures

- You will be held accountable for your actions.
- You must have a clear understanding of your duties and perform them to the best of your ability.
- Providers will be held to the standard of “Best Practices” in the event of an episode!

Emergency Action Plans

- What protocols are in place in the event of an emergency?
- Are the staff trained?
- Do you have the equipment necessary to provide the appropriate care?
- Do you know the exact location of the incident?
- Are people in place to meet the EMS personnel and direct them to the location?
- Is there road access to the location?
- Are there immersion tubs or other types of immersion set up available?

Emergency Action Plans continued.

- Do you have the means to get an accurate core temperature?
- Are you aware of local first responders and their protocols (transport immediately or wait until victim is cooled below 102° f)?
- If you “cool first” you must clearly state that in your EAP!
- At what point do you activate the EMS system?

BENEFITS OF HAVING AN EMERGENCY ACTION PLAN

- Risk management strategy: leads to prevention of athletic injury
- Readily prepared for emergency situations
- Ensures that appropriate care is provided in a timely manner
- Decrease chance of legal action taking place
- Protects liability of ATC and school administration
- Leads to a more effective emergency response



The EAP needs to be specific to each athletic venue and address the following components:

- **Emergency Personnel** – Describe the emergency team involved when the EAP is activated and the roles of each person.
- **Emergency Communication** – What communication devices are available, where, what number to call in an emergency, specific information and directions to the venue to provide to EMS response team.
- **Emergency Equipment** – Location of equipment should be quickly accessible and clearly listed. Equipment needs to be maintained on a regular basis.
- **Medical Emergency Transportation** – Describe options and estimated response times for emergency transportation.



The EAP needs to be specific to each athletic venue and address the following components:

- **Venue Directions with a Map** – (should be specific to the venue, and provide instructions for easy access to venue)
- **Roles of First Responders** – Establish scene safety and immediate care of the athlete, activation of EMS, equipment retrieval, direction of EMS to the scene
- **Emergency Action Plan for Non-Medical Emergencies** – These emergencies can refer to the school emergency action plan if one is in place





How to Respond to an Exertional Heat Stroke Emergency

- 1) **Initial response.** Once exertional heat stroke is suspected, prepare to cool the patient and contact emergency medical services (EMS).
- 2) **Prepare for ice water immersion.** On the field or in a temporary medical tent, half-fill the tub or wading pool with water and ice (before an emergency, check the water source to see how quickly it fills the immersion tub).
 - a) The stock tank can be filled with ice and cold water before an event (or have tub half-filled with water and three to four coolers of ice next to tub; this prevents having to keep tub cold throughout the day).
 - b) Ice should cover the surface of the water at all times.
 - c) If the athlete collapses near an athletic training room, a whirlpool tub or cold shower may be used.
- 3) **Determine vital signs.** Just before immersing the heat-stroke patient, take vital signs.
 - a) Assess core body temperature with a rectal thermistor [link to glossary] (thermistor implies flexible thermometer that stays in during cooling and allows for continuous monitoring of temperature during immersion therapy).
 - b) Check airway, breathing, pulse, and blood pressure.
 - c) Assess the level of central nervous system dysfunction.
- 4) **Begin ice water immersion.** Place the athlete in the ice water immersion tub. Medical staff, volunteers, and teammates may be needed to assist with a smooth and safe entry and exit.
- 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 container's size, cover the torso as much as possible.
 - b) To keep the athlete's head and neck above water, an assistant may hold the victim under the axillae – 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 tub.
 - d) Use a water temperature under 15C (under 60oF).
- 6) **Vigorously circulate water.** During cooling, water should be continuously circulated or 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.
 - a) It may be helpful for an assistant to stand nearby in case the athlete becomes combative.
 - b) Other assistants may be needed to lift or roll the athlete if vomiting occurs.



- 8) **Fluid administration.** If a qualified medical professional is available, an intravenous fluid line can be placed for hydration and support of cardiovascular function.
 - a) Rest the arm to be used on the side of the water immersion tub.
- 9) **Cooling duration.** Continue cooling until the patient's rectal temperature lowers to 39°C (102°F)
 - a) If rectal temperature cannot be measured and cold water immersion is indicated, cool for 10-15 minutes and then transport to a medical facility.
 - b) An approximate estimate of cooling via cold water immersion is 1oC for every five minutes and 1oF every 3 minutes (if the water is aggressively stirred). This means, the cooling rate will be slower initially, and increase the longer the person is in the tub. For example, if someone is in the tub for 15 minutes they would cool approximately 3oC or 5oF during that time.
- 10) **Patient transfer.** Remove the patient from the immersion tub only after rectal temperature reaches 39°C (102°F) and then transfer to the nearest medical facility via EMS as quickly as possible.
- 11) **Cooling is the primary goal before transport.** If appropriate medical staff is available on-site (team physician or athletic trainer); an aggressive cooling modality is readily available (i.e., Cold water immersion, ice/wet towel rotation, high flow cold water dousing); and no other emergency medical services are needed besides the rapid lowering of temperature, then always follow the "cool-first, transport second" doctrine.
- 12) **Advanced medical support.** During transportation, maintain the rectal thermistor, which allows body temperature to be monitored continuously.
 - a) Once the athlete arrives at the hospital, tests will address issues from hyperthermia
 - b) Obtain acute blood enzyme readings to determine muscle, liver, and kidney function
 - c) Check serum urea, electrolytes, glucose, hemoglobin, white blood cells, pH
 - d) Check urine for protein, myoglobin, casts, osmolality, and volume
 - e) Monitor for organ system complications for at least 24 hours and have the individual schedule a follow-up examination with a physician.

If cold water immersion is not available or feasible given the constraints of the task being performed, then cool via the best available means. A good (although not optimal) highly portable alternative is a cooler filled with ice, water, and 12 towels. Place six ice/wet towels all over body and leave on for 2-3 minutes, then place those back in cooler and put the six others on the patient. Continue this rotation every 2-3 minutes. Another alternative when a tub is not available is cold water dousing from a locker room shower or from a hose.

These recommendations are adapted from:

Casa DJ, McDermott BM, Lee EC, Yeargin SW, Armstrong LE, Maresh CM. Cold-water immersion: the gold standard for exertional heat stroke treatment. *Exercise and Sports Science Reviews*. 2007;35(3):141-149.

Defining Roles for the EAP

Who is Involved

- Who is meeting and greeting EMS
 - Get them to the right venue
- Who is recording vitals
- Who is immersing the athlete
 - 120lb vs 300lb athlete
- Will someone travel with athlete during transport
- Who is responsible for notifying family
- Who is responsible for notifying administration
 - Method of communication

Who needs to be aware of episode

- Sports medicine staff
- Parents/Guardians
- Coaches
 - Need to be trained in recognition of heat illness
- Administrators
- EMS if transport required
- Campus security

1. Initial Response: Diagnosis

- Which team member is responsible for recording vitals?
 - Frequency of measurement of vitals
- Do you have/know where all the necessary items are to make a diagnosis?
 - Probe
 - Blood Pressure Cuff
 - Pulse Oximeter
- How do you transport the athlete from the location of the episode to the location of treatment?

2. Prepare for Ice Water Immersion

- Where is the freezer or ice located for rapid cooling?
- Where are the immersion tubs located or which other means of immersion/cooling will be used?
 - How many people required to place patient into immersion tub?
- If tarp is used, how much ice water is needed?
 - Plan for 30-40 gallons

When Do You Call EMS?

- Cooling vs Transport
 - Sports medicine professions trained to cool first
 - Cool to 102° f
 - First responders trained to transport first
- Know the average response time in your area
 - County and volunteer vs. local (town or community responders)
 - KSI suggest cooling for 3 minutes per degree (F)
 - If unable to record a rectal temperature, cool for 15 minutes
 - When do you place the 911 call?
- Who are the EMS first responders in your area?
 - Is there a relationship with responders so they can agree to EAP?

What does EMS need to know?

- Location of patient
 - How to access location
- Patient's history
 - On any meds
 - Previous episodes
 - Other medical conditions
- Mental/emotional status
- Is the patient a minor?

Sources

- National Athletic Trainers' Association Position Statement: Emergency Planning in Athletics
 - J. C. Andersen*; Ronald W. Courson†; Douglas M. Kleiner‡; Todd A. McLoda§
- National Athletic Trainers Association
 - Executive Summary of National Athletic Trainers' Association**
 - Position Statement on Exertional Heat Illnesses:**
 - An update to the 2002 NATA Guidelines***
- How to Respond to an Exertional Heat Stroke Emergency KSI
 - Casa DJ, McDermott BM, Lee EC, Yeargin SW, Armstrong LE, Maresh CM. Cold-water immersion: the gold standard for exertional heat stroke treatment. Exercise and Sports Science Reviews. 2007;35(3):141-149.
- BOC "Guiding Principles for AT Policies and Procedures"
 - <http://www.bocatc.org/system/comfy/cms/files/files/000/000/529/original/Guiding>
 - Principles for AT Policies and Procedures.pdf