

HEAT ILLNESS PREVENTION, RECOGNITION AND MANAGEMENT



INTRODUCTION

Problems related to heat and hydration impact athletes of all ages and ability levels. Heat illness can vary from mild to life-threatening. Fortunately, with awareness, proper planning and preparation, heat illness can be avoided.

EXERTIONAL HEAT ILLNESS

Exertional Heat Illness (EHI) typically, but not always, occurs with strenuous physical activity in humid and hot environments. Several conditions such as lack of acclimatization, deconditioning, obesity, dehydration, concomitant illness, certain medications, occlusive equipment, previous heat illness, certain medical conditions can predispose athletes to exertional heat illness even in more mild conditions.

Exertional heat illness can be categorized as follows:

- Muscle cramps
 - Painful involuntary muscle contraction (often starting in calves, hands or feet) often associated with dehydration, electrolyte imbalances, and muscle fatigue.
- Heat exhaustion
 - Inability to continue to exercise due to fatigue/energy depletion.
 - Associated with heavy sweating, dehydration, sodium loss and energy loss.
 - Often presents with signs AND symptoms such as: dizziness, headache, nausea, diarrhea, decrease in urine output, pallor (pale skin), muscle cramps, weakness, headache, hyperventilation (breathing rapidly), nausea, and/or diarrhea.
 - Core (rectal) temperature generally between 97 degrees F and 104 degrees F.
- Exertional Heat Stroke (EHS)
 - Life-threatening illness is characterized by: 1) core (rectal) temperature >104 degrees F (40 degrees C) and 2) central nervous system (CNS) dysfunction (confusion, mental status changes, collapse, delirium, etc).
 - Signs and symptoms include: Mental status changes (confusion, delirium, loss of consciousness), collapse, hyperventilation (rapid breathing), vomiting, diarrhea, seizures (convulsions), rapid heart rate, hypotension (low blood pressure), and decreased sweating (although skin can be either wet or dry).

PREVENTION

- When possible, identify athletes at risk for heat illness.
 - Some at-risk athletes include: obese athletes, catchers, athletes on stimulant or other 'thermogenic' medications or supplements (such as ADD medication), deconditioned ('out of shape') athletes, athletes with prior history of EHI, athletes without appropriate acclimatization, athletes who have a current or recent illness (particularly with a fever), athletes with sickle cell trait.
- Encourage athletes to gradually acclimatize to heat and humidity.
 - This is best done by gradually increasing duration of exposure to heat/humidity and the intensity of exercise in the heat over a matter of many days.
 - Initially, begin with short, lower intensity practices/training and allow for more frequent and longer rest and recovery between exercise longer recovery.
 - Focus on instruction rather than conditioning during the first several practices
 - During hot/humid times of the year, practice at cooler times of day (morning and evening).
 - During extreme conditions, consider indoor practices (which can include cage work, bullpens, indoor fielding drills, etc).
- Encourage all athletes (and umpires) to hydrate regularly before, during, and after exercise
- With young athletes it is extremely important to take frequent rest breaks and to ingest fluids every 15 to 30 minutes. Young athletes are at increased risk of heat illness.
- During hotter and more humid conditions, minimize clothing and/or equipment.
- Fluids and drinking opportunities should be unlimited during games and practices, particularly during hot, humid conditions. NEVER withhold water from athletes.

- Make efforts to have Certified Athletic Trainer (AT) available at games, tournaments and practices when possible.
- If and when possible, check pre- and post-practice/game weights during hot/humid conditions (an athlete who is not within 3 percent of the previous pre-practice weight should not be allowed to participate until they are appropriately hydrated).
- When possible, the AT or event personnel should ideally use a wet-bulb globe temperature (WBGT) or heat index daily to determine heat/humidity conditions for the day. Game and/or practice restrictions should be based on the readings of the WBGT or the heat index to help make decisions regarding practices and games. The AT or event personnel should check the readings at least 30 minutes prior to competition and/or practices. Based on the initial reading for the day and the predicted high temperature for the day, the AT will continue to use the WBGT throughout the day if needed. On higher risk days, the AT will generally check the WBGT every two hours during peak times (i.e. 10 a.m. to 6 p.m.). The AT or on site medical personnel should work in conjunction with the site event coordinator to determine any restrictions.
- When warranted by environmental conditions, the AT or event medical personnel should:
 - Provide ice towels in dugouts
 - Prepare cold water/ice immersion tubs
- *Any coach, parent, or other staff member who detects an athlete (or umpire) with signs or symptoms suggesting possible heat-related illness should immediately report this to the athletic trainer or available medical personnel.*

TREATMENT

Once a potential heat illness has been identified by the AT, or suspected by coach or supervising adults, initiate the following course of action:

- Muscle cramps
 - Remove from activity and transfer to cool, shaded environment, immediately start replacing fluids, and stretch affected area.
- Heat exhaustion
 - Activate Emergency Action Plan if necessary (link to EAP article). Monitor closely.
 - Move to the shade and/or a cool environment. Use ice towels and/or ice bags (around neck, underarms and groin area) to cool body temperature down. Use ice immersion if available.
 - Assess vital signs and take a core temperature (rectal). Rectal temperatures are the only accurate on-field measurement (oral, tympanic, forehead thermometers are often inaccurate and can be misleading)
- Exertional Heat Stroke
 - Call 911/Activate Emergency Action Plan.
 - Assess vital signs and take core temperature (rectal).
 - Use ice water immersion to cool body temperature as quickly as possible. Once core temperature returns to 101 deg F remove from the water, but continue to keep cool with ice towels, ice bags, or air conditioning. Do not transport prior to adequate core temperature cooling.

- DO NOT hesitate to initiate aggressive cooling via ice immersion if Exertional Heat Stroke is suspected (even in the absence of accurate core body temperature). Rapid cooling is critical to preventing end-organ damage and often is a life-saving intervention.
- Remember, COOL FIRST, TRANSPORT LATER.

HYDRATION

Stress importance of hydration before, during and after exercise. This should start even a few days prior to heat exposure and hydrating well the day/evening before is particularly important.

- During exercise, continue to encourage athletes to drink as often as possible.
- Rehydration typically should include more than just water as athletes may drink more and benefit from some electrolyte repletion (i.e. combination of sports drink and water)
- Encourage participants to carry a water bottle at all times, at the field and away from the field.

CONCLUSION

Exertional heat illness can often be prevented and appropriately managed with attention and awareness of environmental conditions that predispose athletes to heat illness, taking appropriate common-sense preventive measures and rapidly recognizing and treating athletes who show signs or symptoms of heat illness.