

HEAT ILLNESS RECOGNITION AND MANAGEMENT

There are four main types of exertional heat illness, but it's important to recognize these don't necessarily run on a continuum. A person could suffer from heat stroke without showing less severe heat illness conditions such as heat cramps. Below are the different types of heat illness, special risk factors, symptoms and management strategies.

HEAT CRAMPS

Typically painful, involuntary muscle contractions of active muscles. These can occur in muscles throughout the body including those in the lower extremities, upper extremities and abdomen. Muscle cramps can be caused by dehydration or electrolyte imbalances.

SPECIAL RISK FACTORS

Sickle cell trait – Heat cramps and exertional sickling can mimic each other. Be aware if an athlete has sickle cell trait.

SIGNS & SYMPTOMS

- * Painful muscle cramps that can limit mobility
- * Tightness in the muscle can typically be felt by another person
- * Most common in abdominals and legs
- * Usually last a brief amount of time and are self-limiting

MANAGEMENT

- ▶ Remove athlete from play
- ▶ Can provide food high in salt or salt replacement solution (1/2 teaspoon salt dissolved in 16-20 oz. water)
- ▶ Stretch and massage the muscle
- ▶ Drink **WATER** or a sports drink
- ▶ Athlete can typically return to play when the muscle cramp stops

HEAT SYNCOPE

A fainting episode associated with high heat and humidity. This typically occurs because adequate blood flow does not return to the brain and will cause a loss of consciousness.

SPECIAL RISK FACTORS

Prolonged standing in high temperature and humidity can increase the risk of heat syncope.

SIGNS & SYMPTOMS

- * Loss of consciousness or fainting
- * Lightheadedness
- * Weakness and fatigue
- * Pale, clammy skin

MANAGEMENT

- ▶ Move athlete to a cool area/shade
- ▶ Have athlete lie down/elevate legs
- ▶ Instruct athlete to drink **WATER** or a sports drink.
- ▶ Monitor and maintain airway, breathing and circulation. If any concern about ABC's, call 911.
- ▶ Athlete can return to play once evaluated by a medical professional and other complications and medical conditions have been ruled out.

HEAT ILLNESS RECOGNITION AND MANAGEMENT

HEAT EXHAUSTION

Occurs when an athlete cannot effectively exercise in high heat and humidity conditions due to an elevated core body temperature. It can cause heavy sweating, rapid pulse and the athlete may feel tired and be unable to perform athletically.

SPECIAL RISK FACTORS

Risk factors are the same as those listed for general heat illness. These include lack of acclimatization, dehydration, obesity, illness, certain medications and low fitness levels.

SIGNS & SYMPTOMS

- | | | |
|--------------------|-----------------------------|----------------------------|
| * Heavy sweating | * Fast and weak pulse | * Headache/nausea/vomiting |
| * Cool/clammy skin | * Dizziness/lightheadedness | * Fatigue/weakness |
| * Poor performance | | |

MANAGEMENT

- | | |
|---|---|
| ▶ Remove excess clothing/equipment | ▶ Move to a cool shaded area |
| ▶ If conscious give WATER or a sports drink slowly. | ▶ Cover the extremities and trunk with ice towels or ice bags |
| ▶ Based on symptoms it may be recommended the athlete waits 24-48 hours before returning to play. | ▶ If medical professionals are onsite, core body temperature should be obtained with a rectal thermometer (only accurate method). The lack of an accurate core body temperature can lead to poor treatment decisions. |

It can sometimes be difficult to tell the difference between heat exhaustion and heat stroke. If there is any concern for heat stroke, a medical professional should check the core body temperature with a rectal thermometer (only accurate method.). If a medical professional is not available onsite, cold tub immersion (35-58 deg.) should be initiated and the heat stroke treatment protocol should be followed until medical professionals arrive and can determine the appropriate treatment steps.

HEAT STROKE

A life threatening condition with two main components – core body temperature greater than 104 degrees (measured by rectal thermometer) and central nervous system dysfunction which usually presents in behavior changes and altered levels of consciousness. Heat stroke can result in death so it is critical to recognize and manage this condition immediately.

Death from heat stroke is 100% preventable when proper cooling is initiated within 10 minutes of collapse.

SPECIAL RISK FACTORS

Risk factors are the same as those listed for general heat illness. These include lack of acclimatization, dehydration, obesity, illness, certain medications and low fitness levels. It is important to note that heat stroke can occur even when temperature and humidity are not elevated.

SIGNS & SYMPTOMS

- | | | |
|--|--------------------------------------|---|
| * Rectal temperature > 104 deg. | * Irritability/emotional instability | * Nausea/vomiting/diarrhea |
| * Altered level or loss of consciousness | * Dizzy | * Headache |
| * Profuse sweating or hot,red,dry skin | * Stagger/inability to walk | * Fast pulse, quick breathing, low blood pressure |
| * Dry mouth | * Poor performance | |

MANAGEMENT

- | | |
|---|---|
| ▶ Heatstroke is <i>life-threatening</i> , activate EMS, call 911 and maintain the ABC's (airway, breathing and circulation). Continue to monitor vital signs. | ▶ If medical professionals are onsite, core body temperature should be obtained with a rectal thermometer (most accurate method). The lack of an accurate core body temperature can lead to poor treatment decisions. |
| ▶ Remove excess clothing/equipment | ▶ COOL FIRST, TRANSPORT SECOND. Move athlete to the cooling area and immerse in cold tub (35-58 deg.) until core (rectal) temperature is 101-102 degrees. If a cold tub is not available rotate wet ice towels over the entire body, douse with cold water or move to a cold shower. |

**HEAT STROKE HAS A 100% SURVIVAL RATE
IF PROPER COOLING IS INITIATED WITHIN 10 MINUTES OF COLLAPSE.**

KSHSAA RECOMMENDED EXCESSIVE HEAT/HUMIDITY ACTIVITY MODIFICATION POLICY

The modifications below should be applied to any sport/activity taking place outdoors OR in un-air conditioned facilities.

HEAT INDEX	HEAT ILLNESS RISK WITH PHYSICAL ACTIVITY AND/OR PROLONGED EXPOSURE These heat index zones are general guidelines only. Heat illness, INCLUDING HEAT STROKE, can occur in any zone depending on an individual's reaction to the environment.
80°-89° Zone 1	<ul style="list-style-type: none"> - Fatigue possible with prolonged exposure and/or physical activity - Monitor at-risk athletes closely - MINIMUM 3 rest/hydration breaks per hour / Break length MINIMUM 4 minutes - Cold tubs prepared and ready (recommended)
90°- 103° Zone 2	<ul style="list-style-type: none"> - Heat cramps or heat exhaustion possible - 2 HOUR MAXIMUM length of practice - Football: Helmets & shoulder pads only / No protective equipment when conditioning - MINIMUM 4 rest/hydration breaks per hour / Break length MINIMUM 4 minutes - Cold tubs prepared and ready
103°- 124° Zone 3	<ul style="list-style-type: none"> - Heat cramps or heat exhaustion likely, heatstroke possible - 1 HOUR MAXIMUM length of practice - No protective equipment to be worn - No conditioning - Rest/hydration breaks MUST total 20 minutes - Cold tubs prepared and ready
>124°	<ul style="list-style-type: none"> - Heatstroke highly likely - No outdoor practices or practices in un-air conditioned facilities should be permitted
<ul style="list-style-type: none"> - Participants should ALWAYS have unrestricted access to fluids. - If the heat index value at your location is on the border between two levels, follow the guidelines for the more conservative level. - Heat index values should be rechecked every 30 minutes. 	

HEAT INDEX CHART

Use the chart below to find the heat index based on air temperature and relative humidity at your site. Make every effort to obtain temperature and humidity levels at your site. Factors such as surface (artificial turf vs. natural grass) will affect air temperature readings. Find your air temperature value across the top of the chart and go down until you find your site's relative humidity value. **THIS IS THE HEAT INDEX based on the values you obtained.** It is an index of the body's sensation of heat caused by the temperature and humidity (the reverse of the "wind chill factor").

Environmental temperature (F°)																
	80°	82°	84°	86°	88°	90°	92°	94°	96°	98°	100°	102°	104°	106°	108°	110°
Relative Humidity	Heat Index (Apparent Temperature)															
	The body's sensation of heat based on air temperature and humidity															
5%	77°	79°	80°	81°	83°	84°	86°	87°	89°	91°	93°	94°	96°	98°	100°	101°
10%	78°	79°	81°	82°	84°	85°	87°	89°	90°	92°	94°	96°	98°	100°	102°	104°
15%	78°	80°	81°	83°	84°	86°	88°	90°	92°	94°	96°	98°	100°	103°	105°	108°
20%	79°	80°	81°	83°	85°	86°	88°	90°	93°	95°	97°	100°	103°	106°	109°	112°
25%	79°	80°	82°	83°	85°	87°	89°	91°	94°	97°	100°	103°	106°	109°	113°	117°
30%	79°	80°	82°	84°	86°	88°	90°	93°	96°	99°	102°	106°	110°	114°	118°	122°
35%	80°	81°	83°	85°	87°	89°	92°	95°	98°	102°	106°	110°	114°	119°	123°	129°
40%	80°	81°	83°	85°	88°	91°	94°	97°	101°	105°	109°	114°	119°	124°	130°	136°
45%	80°	82°	84°	87°	89°	93°	96°	100°	104°	109°	114°	119°	124°	130°	137°	
50%	81°	83°	85°	88°	91°	95°	99°	103°	108°	113°	118°	124°	131°	137°		
55%	81°	84°	86°	89°	93°	97°	101°	106°	112°	117°	124°	130°	137°			
60%	82°	84°	88°	91°	95°	100°	105°	110°	116°	123°	129°	137°				
65%	82°	85°	89°	93°	98°	103°	108°	114°	121°	128°	136°					
70%	83°	86°	90°	95°	100°	105°	112°	119°	126°	134°						
75%	84°	88°	92°	97°	103°	109°	116°	124°	132°							
80%	84°	89°	94°	100°	106°	113°	121°	129°								
85%	85°	90°	96°	102°	110°	117°	126°	135°								
90%	86°	91°	98°	105°	113°	122°	131°									
95%	86°	93°	100°	108°	117°	127°										
100%	87°	95°	103°	112°	121°	132°										

Chart reproduced from the National Weather Service.

Sources where temperature, relative humidity and heat index information can be obtained:

Use of a heat index monitor or sling psychrometer
KSHSAA website (www.kshsaa.org)

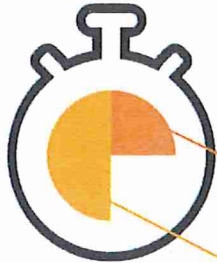
National Weather Service website (www.weather.gov)
Various weather websites and mobile applications

The wet bulb globe temperature is the gold standard to measure environmental conditions during exercise, but does require a specific monitor that will measure the WBGT at your local practice site. If you are not using WBGT to monitor conditions, using the heat index is an acceptable option.

BEAT THE HEAT

Summer's high temperatures put student athletes at increased risk of heat illness. There are several types of heat illness. They range in severity, from heat cramps and heat exhaustion, which are common but not severe, to heat stroke, which can be deadly. Although heat illnesses can be fatal, death is preventable if they're quickly recognized and properly treated.

DEHYDRATION AND HEAT ILLNESSES



As a rule-of-thumb, most athletes should consume 200 to 300 milliliters of fluid every

15 MINUTES
OF EXERCISE.

It takes only **30 MINUTES** for cell damage to occur with a core body temperature of 105 degrees.



Currently, 13 states have heat-acclimatization policies, for secondary school athletics with New Jersey being the first.



Exertional heat stroke is one of the top three killers of athletes and soldiers in training.

- From 2010-15, 20 athletic heat stroke fatalities were reported.
- It takes seven to 14 days for a body to adapt to exercising in the heat.
- Dehydration at levels of 3 to 4 percent body mass loss can reduce muscle strength by an estimated 2 percent.

SAFETY TIPS

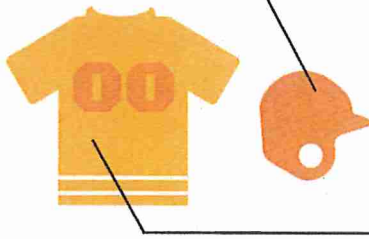


Have sports drinks on hand for workout sessions lasting longer than an hour.

Keep beverages cold – cold beverages are consumed 50 percent more than warm beverages.

Hydrate before, during and after activity.

Remove unnecessary equipment, such as helmets and padding, when environmental conditions become extreme.



Clothing worn by athletes should be light colored, lightweight and protect against the sun.

- For the first week or so, hold shorter practices with lighter equipment so players can acclimate to the heat.
- Follow a work-to-rest ratio, such as 10-minute breaks after 40 minutes of exercise.
- Get an accurate measurement of heat stress using a wet-bulb globe temperature, which accounts for ambient temperature, relative humidity and radiation from the sun.
- If someone is suffering from exertional heat stroke, remember to cool first and transport second.
- Have large cold tubs ready before all practices and games in case cold water immersion is needed to treat exertional heat stroke.

SIGNS OF MINOR HEAT ILLNESS



Dizziness

Cramps, muscular tightening and spasms



Lightheadedness, when not associated with other symptoms

EARLY WARNING SIGNS OF EXERTIONAL HEAT STROKE

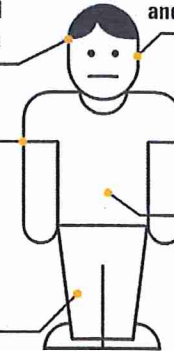
Headache, dizziness, confusion and disorientation

Excessive sweating and/or flushing

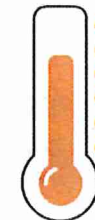
Fatigue

Nausea and/or vomiting

Chills and/or goose bumps



SIGNS OF EXERTIONAL HEAT STROKE



Core body temperature of more than 105 degrees



Signs of nervous system dysfunction, such as confusion, aggression and loss of consciousness



Increased heart rate

Rapid breathing

Seizures



Low blood pressure

Sources: Korey Stringer Institute, American Medical Society for Sports Medicine, NATA

EMERGENCY ACTION PLAN

VENUE: _____ PRIMARY PHONE: _____

VENUE ADDRESS: _____

AMBULANCE ACCESS TO VENUE: Yes ____ NO ____

Location of entrance _____

AED ONSITE & AVAILABLE FOR IMMEDIATE ACCESS ____

AED LOCATION: _____

EMERGENCY RESPONSE PERSONNEL/CONTACTS

Identify personnel who will be involved in an emergency medical response. **The person present with the highest level of medical training should be designated to lead and coordinate the emergency response until emergency medical personnel arrive on the scene.**

	NAME	PHONE
EMS	_____ 911 OR	_____
Building response team #1	_____	_____
Bldg. Response Team #2	_____	_____
Bldg. Response Team #3	_____	_____
Bldg. Response Team #4	_____	_____
Bldg. Response Team #5	_____	_____
Principal	_____	_____
Asst. Principal	_____	_____
Lead Teacher	_____	_____
Other	_____	_____
Hospital	_____	_____

1. Person(s) responsible to activate EMS (call 911): _____

PERSON CALLING SHOULD: – Explain the type of emergency – Provide exact location of emergency – Provide exact location of where ambulance can access the facility – Provide condition of patient and type of care being administered – Provide caller name and contact information – DO NOT HANG UP until instructed by dispatcher

Person(s) responsible to retrieve any emergency medical equipment:

Location of emergency/first aid equipment: _____

Location of the nearest AED: _____

Person(s) responsible to prepare cold tub: _____

Person(s) responsible to meet/escort EMS to the scene:

PERSON MEETING AMBULANCE SHOULD:

– Meet the emergency personnel as they arrive at the site – Have keys to any potentially locked doors, gates etc.

Emergency Action Plan updated on: _____

EMERGENCY ACTION PLANS SHOULD BE REVIEWED & REHEARSED ANNUALLY