EXERTIONAL HEAT ILLNESS
INFORMATION, GUIDELINES & RECOMMENDATIONS

Heat illness, sometimes called exertional heat illness (EHI), in athletes is a common and serious condition, but one that is preventable. High temperatures and humidity can put athletes at risk for heat illness and may have catastrophic consequences if not properly recognized and treated. Heat illness can present in several different ways, from muscle cramps to heat exhaustion and heat stroke. The Kansas State High School Activities Association wishes to provide its member schools recommended guidelines that can be useful in establishing or refining an individualized heat acclimatization plan or policy, as well as guidelines to help prevent, recognize and treat heat illness.

Heat Acclimatization and Heat Illness Prevention Position Statement

National Federation of State High School Associations (NFHS)
Sports Medicine Advisory Committee (SMAC)

The following is the **Heat Acclimatization and Heat Illness Prevention Position Statement** authored by the National Federation of State High School Associations and its Sports Medicine Advisory Committee. The substance of the position statement provides as follows:

Exertional Heatstroke (EHS) is the leading cause of preventable death in high school athletics. Students participating in high-intensity, long-duration or repeated same-day sports practices and training activities during the summer months or other hot-weather days, as well as those with sickle cell trait, are at greatest risk. Football has received the most attention because of the number and severity of exertional heat illnesses. Notably, the National Center for Catastrophic Sports Injury Research reports that **28 high school football players died of EHS between 2008 and 2017**. EHS also results in thousands of emergency room visits and hospitalizations throughout the nation each year.

This NFHS Sports Medicine Advisory Committee (SMAC) position statement is the companion piece to the NFHS's online course ***A Guide to Heat Acclimatization and Heat Illness Prevention.*** **This position statement provides an outline of "Fundamentals" and should be used as a guiding document**. Further and more detailed information can be found within the NFHS online course, the NFHS Sports Medicine Handbook, the NFHS SMAC "Position Statement and Recommendations for Hydration to Minimize the Risk for Dehydration and Heat Illness" and the resources listed.

Following the recommended guidelines in this position statement and *A Guide to Heat Acclimatization and Heat Illness Prevention* can reduce the risk and incidence of EHS and the resulting deaths and injuries in high school athletics. The NFHS recognizes that various states and regions of the country have unique climates and variable resources, and that there is no "one-size-fits-all" optimal acclimatization plan. However, it is recommended that all of the "Fundamentals" be incorporated into any heat acclimatization plan to improve athlete safety. In addition, ***Heat Illness Prevention*** **at www.NFHSLearn.com should be required viewing for all coaches**.

Heat Acclimatization and Safety Priorities:

- Recognize that EHS is the leading preventable cause of death among high school athletes.
- Know the importance of a formal preseason heat acclimatization plan.
- Know the importance of having and implementing a specific hydration plan, keeping your athletes well-hydrated, and encouraging and providing ample opportunity for regular fluid replacement.
- Know the importance of appropriately modifying activities in relation to the environmental heat and stress and contributing individual risk factors (e.g., sickle cell trait, illness, obesity) to keep your athletes safe and performing well.
- Know the importance for all members of the coaching staff to closely monitor all athletes during practice and training in the heat, and recognize the signs and symptoms of developing heat illnesses.
- Know the importance of, and resources for, establishing an emergency action plan and promptly implementing it in case of suspected EHS or other medical emergency.

FUNDAMENTALS OF A HEAT ACCLIMATIZATION PROGRAM

1. **Physical exertion and training activities should begin slowly and continue progressively. An athlete cannot be "conditioned" in a period of only two to three weeks.**

   A. Begin with shorter, less intense practices and training activities, with longer recovery intervals between bouts of activity.
   B. Minimize protective gear (helmets only, no shoulder pads) during the first several practices, and introduce additional uniform and protective gear progressively over successive days.
   C. Emphasize instruction over conditioning during the first several practices.

   Rationale: The majority of heat-related deaths happen during the first few days of practice, usually prompted by doing too much, too soon, and in some cases with too much protective gear on too early in the season (wearing helmet, shoulder pads, pants and other protective gear). Players must be allowed the time to adapt safely to the environment, intensity, duration and uniform/equipment.

2. **Keep each athlete's individual level of conditioning and medical status in mind and adjust activity accordingly. These factors directly affect exertional heat illness risk.**

   Rationale: Athletes begin each season's practices and training activities at varying levels of physical fitness and varying levels of risk for exertional heat illness. For example, there is an increased risk if the athlete is obese, unfit, has been recently ill, has a previous history of exertional heat illness or has sickle cell trait.

3. **Adjust intensity (lower) and rest breaks (increase frequency/duration), and consider reducing uniform and protective equipment, while being sure to monitor all players more closely as conditions are increasingly warm/humid, especially if there is a change in weather from the previous few days.**

   Rationale: Coaches must be prepared to immediately adjust for changing weather conditions, while recognizing that tolerance to physical activity decreases and exertional heat illness risk increases, as the heat and/or humidity rise. Accordingly, it is imperative to adjust practices to maintain safety and performance.

   Use the heat index chart on the following page as a general guide in determining when activity modifications are necessary.

4. **Athletes must begin practices and training activities adequately hydrated.**

   Rationale: While proper hydration alone will not necessarily prevent exertional heat illness, it will decrease risk.

   See the hydration strategies in this document to use as a guide for hydrating your athletes.

5. **Recognize early signs of distress and developing exertional heat illness, and promptly adjust activity and treat appropriately. First aid should not be delayed!**

   Rationale: An athlete will often show early signs and/or symptoms of developing exertional heat illness. If these signs and symptoms are promptly recognized and the athlete is appropriately treated, serious injury can be averted and the athlete can often be treated, rested and returned to activity when the signs and symptoms have resolved.

6. **Recognize more serious signs of exertional heat illness (clumsiness, stumbling, collapse, obvious behavioral changes and/or other central nervous system problems), immediately stop activity and promptly seek medical attention by activating the Emergency Medical System. Onsite rapid cooling should begin immediately.**

   Rationale: Immediate medical treatment and prompt rapid cooling can prevent death or minimize further injury in the athlete with EHS. Ideally, pools or tubs of ice water to be used for rapid cooling of athletes should be available onsite and personnel should be trained and practiced in using these facilities for rapid cooling. Ice water baths are the preferred method for rapid cooling; however, if ice water pools or tubs are not available, then applying ice packs to the neck, axillae and groin and rotating ice water-soaked towels to all other areas of the body can be helpful in cooling an affected athlete. Remember, cool first, transport later.

   Review the heat illness signs and symptoms information in this document.

7. **An Emergency Action Plan with clearly defined written and practiced protocols should be developed and in place ahead of time.**

   Rationale: An effective emergency action plan (EAP) should be in place in case of any emergency, as a prompt and appropriate response in any emergency situation can save a life. The EAP should be designed and practiced to address all teams (middle school, freshman, junior varsity, varsity) and all practice and game sites.

HEAT ILLNESS RISK FACTORS

Understand and be aware of the following heat illness risk factors:

1. High temperature and humidity
   a. Heat index higher than 80 degrees (calculated from temperature and humidity)
   b. Wet Bulb Globe Temperature (WBGT) higher than 82 (calculated from WBGT monitor)

2. Poor hydration before and during practice/games

3. Inadequate rest/hydration breaks

4. Body Mass Index greater than 27 (based on height and weight)

5. Low fitness level

6. Lack of proper heat acclimatization

7. High intensity training

8. Lack of education, awareness and preparation

9. Sickle cell trait*

10. Illness*
    a. Fever greater than 100.4 degrees
    b. Nausea/vomiting/diarrhea
    c. Respiratory infection
    d. Serious skin rash

11. History of heat illness in the past*

* It is critically important for coaches and school medical personnel to have access to their student-athletes' health history information from the pre-participation physical.

KSHSAA RECOMMENDED HEAT ILLNESS PREVENTION STRATEGIES

1. Follow a proper heat acclimatization program (See next section – Heat Acclimatization)

2. Keep athletes hydrated
   a. Allow unrestricted access to water during practice and games (See *HYDRATION* section of this document).

3. Each school or district should develop a heat contingency policy **based on heat index or wet bulb globe temperature (WBGT)**. Your policy should address the following modifications:
   a. Modify use of equipment if necessary. Remove excess clothing, pads, helmets and other equipment.
   b. Increase breaks during practice when appropriate to provide water/sports drinks and shade.
   c. Change practice times to early mornings or evenings per heat index policy.
   d. Limit practice time if necessary.
   e. Give adequate cooling breaks between practice times.

   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. The WBGT takes temperature, humidity, wind speed, sun angle and cloud cover into account.

   The heat index level can be obtained several ways. Heat index meters are available for purchase. If you do not have access to a device to use onsite to obtain the WBGT or heat index, you can go to the KSHSAA website at http://www.kshsaa.org/Public/General/Weather.cfm to obtain the information for your location. Various weather websites and weather apps are also available to obtain the heat index.

   The heat index or wet bulb globe temperature should ideally be obtained at the site where the activity is taking place.

   See *SAMPLE HEAT POLICY* on page 11.

4. Don't allow an athlete with fever, nausea/vomiting, or other illness to practice or play in a contest.

5. A cooling area should be established and available at all times. This could be an area of shade, a tent or immediate access to an air conditioned facility. A cold tub should be located in the cooling area. The water temperature should be approximately 50°F, and the tub should be large enough to submerge someone up to their torso in a seated position. An old whirlpool tub, a large children's swimming pool or a livestock tank could be used. If a tub is not available, rotating wet ice towels over the entire body, dousing the person with cold water through a hose, or a cold shower could be other rapid cooling options. Click HERE for additional information regarding rapid body cooling.

6. Make sure your athletes are taking care of their overall health
   a. Adequate sleep
   b. Proper nutrition
   c. Proper hydration habits throughout the week

7. **NEVER allow student-athletes to consume nutritional supplements unless prescribed by a physician.** Energy drinks should also NEVER be consumed by your student-athletes. These substances create an even higher risk to athletes exercising in the heat.

KSHSAA RECOMMENDED HEAT ILLNESS PREVENTION STRATEGIES

8. Be prepared

a. Have an Emergency Action Plan that has been practiced and reviewed in case an athlete has a heat illness. Click HERE for emergency action planning information which includes a template you can download to begin building a plan. There is also a sample EAP on page 12.
   - When rapid onsite cooling is necessary, **ALWAYS COOL THE ATHLETE FIRST AND TRANSPORT SECOND!** Be sure this protocol is rehearsed and reviewed with your coaches and local EMS personnel BEFORE practices begin each August.

b. Have trained personnel available

c. Know your athletes and their health histories
   - Coaches and other staff, including athletic trainers, should always be aware of each athlete's risk factors for heat illness. Coaches MUST know their at-risk athletes and modify their activity accordingly. Student athletes who have sickle cell trait, a previous history of exertional heat illness, are obese, are unfit or are recovering from a recent illness are all more susceptible to heat illness.

d. Know your school's heat contingency policy (See example heat policy on page 11)

e. Educate coaches, staff, athletes and parents to recognize and treat heat illness. Prevention and early recognition is critical to avoiding heat illness. An easy-to-read handout is available on the NFHS website at https://www.nfhs.org/media/1015650/2015-nata-heat-illness-handout.pdf and can be printed and distributed at the beginning of each school year.

f. Have the proper equipment to recognize and treat heat illness. The following is a recommended list of equipment that should be available at any warm weather practice:
   - Wet bulb globe thermometer or heat index monitor
   - Cold water immersion tub
   - Ice immediately available for immersion tub
   - Rectal thermometer (trained medical personnel only)
   - Water source (such as garden hose)
   - Ice towels (towels submerged in ice water)
   - Tent, shaded area or access to an air conditioned facility

HEAT ACCLIMATIZATION

One of the most important factors in preventing heat illness is to follow a proper heat acclimatization progression

1. **What is heat acclimatization?**
   Heat acclimatization is the process of the body adjusting to intense physical activity in elevated levels of heat and humidity. The body normally sweats to cool off, but if the heat and humidity (heat index) are too high, sweating may not be enough and the inner body (core) temperature may rise to a dangerous level. During acclimatization the body gradually adjusts and becomes more tolerant to the elevated heat/humidity levels. This takes place through several physiologic mechanisms including increased sweat rate, lower heart rate, and better blood flow to the entire body. With the proper progression, the body can safely adjust to intense physical activity in hot/humid environments over a period of approximately 7 to 14 days. Most research on proper heat acclimatization indicates the first 5 days of the preseason is the most important period of the acclimatization process.

2. **Who needs to do go through heat acclimatization?**
   Every athlete is susceptible to heat illness and needs to acclimatize to the heat no matter their fitness level when they show up to the first day of practice. Even if athletes have been working out all summer their bodies may not be able to immediately adapt to the high temperatures and humidity often present in August in Kansas. In today's culture, we often spend many hours indoors during the summer with air conditioning which makes the body less tolerant to intense exercise in extreme heat and humidity.

3. **KSHSAA heat acclimatization rules**
   KSHSAA Handbook rules 30-1-8 and 35-1-1 address required heat acclimatization rules for **all KSHSAA Fall sports**. Below are the components of these rules.

KSHSAA Preseason Heat Acclimatization Components KSHSAA Handbook Rule 30-1-8		
	Practice Days 1-5	Practice Days 6+
# Practices permitted per day	1	• 2 permitted every other day • Double practice days must be separated by a single practice or rest day
Length of practice allowed*	3 hours	• 3 hours single practice • 5 hours combined (double practice days)
Extra walkthrough time	1 hour (but must be separated from practice by at least 3 hours)	
*Warm-up, stretching, conditioning and weight-room activities are included as part of practice time		

Preseason Football equipment/contact progression (Rule 35-1-1):

- Days 1 & 2 of practice: Helmets only (Air and Bags only are permitted)
- Days 3 & 4 of practice: Helmets and shoulder pads are permitted (Day 3: Control permitted; Day 4: Thud permitted).
- Day 5 through Saturday of SCW #9 of practice: Full Contact (Air, Bags, Control, Thud and Live Action are permitted) may begin with the following guidelines: On any day involving multiple practices, only one practice may involve Thud and/or Live Action.

HYDRATION

In addition to acclimatization, proper hydration is another critical component to prevent heat illness.

1. **How do you know if your athlete is hydrated? There are several methods to measure an athlete's hydration level:**

   a. Urine color
   The volume and color of your urine is an excellent way of determining if you're well hydrated. Small amounts of dark urine mean that you need to drink more, while a "regular" amount of light-colored or nearly clear urine generally means you are well hydrated. (See urine chart-next page)

   b. Weigh-in before and after practice
   Athletes should be weighed before and after warm weather practices in dry clothes. They should drink appropriate amounts of fluid for the amount of weight lost. An athlete should not be allowed to participate if they are at a 2% or greater weight deficit from the beginning of their previous practice.

   c. Sweat rate
   You can calculate our own sweat rate. Knowing how much an athlete sweats per hour can help you calculate how much fluid to drink to replace your sweat loss and stay hydrated. See how to calculate an athlete's sweat rate on the Korey Stringer Institute website at http://ksi.uconn.edu/wp-content/uploads/sites/1222/2015/04/Sweat-Rate-Calculator.pdf.

2. **There are many strategies to maintain proper hydration. The following are some basic hydration principles to follow:**

- Appropriate hydration before, during and after exercise is important for maintaining peak athletic performance. Fluid losses of as little as 2% of body weight (less than 4 pounds in a 200-pound athlete) can impair performance by increasing fatigue. This is important because it's common for some athletes to lose between 5-8 pounds of sweat during a game or intense practice. So it's easy for athletes to become dehydrated if they don't drink enough to replace what is lost in sweat.
- Recognize and respond to early warning signs of dehydration.
- DRINK EARLY and DRINK OFTEN during activity. Do not let athletes rely on thirst. Schedule frequent fluid breaks for re-hydrating. If athletes wait until they are thirsty it may be too late.
- Encourage GOOD hydration choices: water, sport drinks with low sodium and carbohydrate levels, AVOID: energy drinks, soda, fruit juices, carbonated beverage, and caffeine.
- Encourage drinking fluids, not pouring them. Dumping fluid over the head won't help restore body fluids or lower body temperature.
- Provide easily accessible fluids during practice and games.

3. **Hyponatremia Risk**

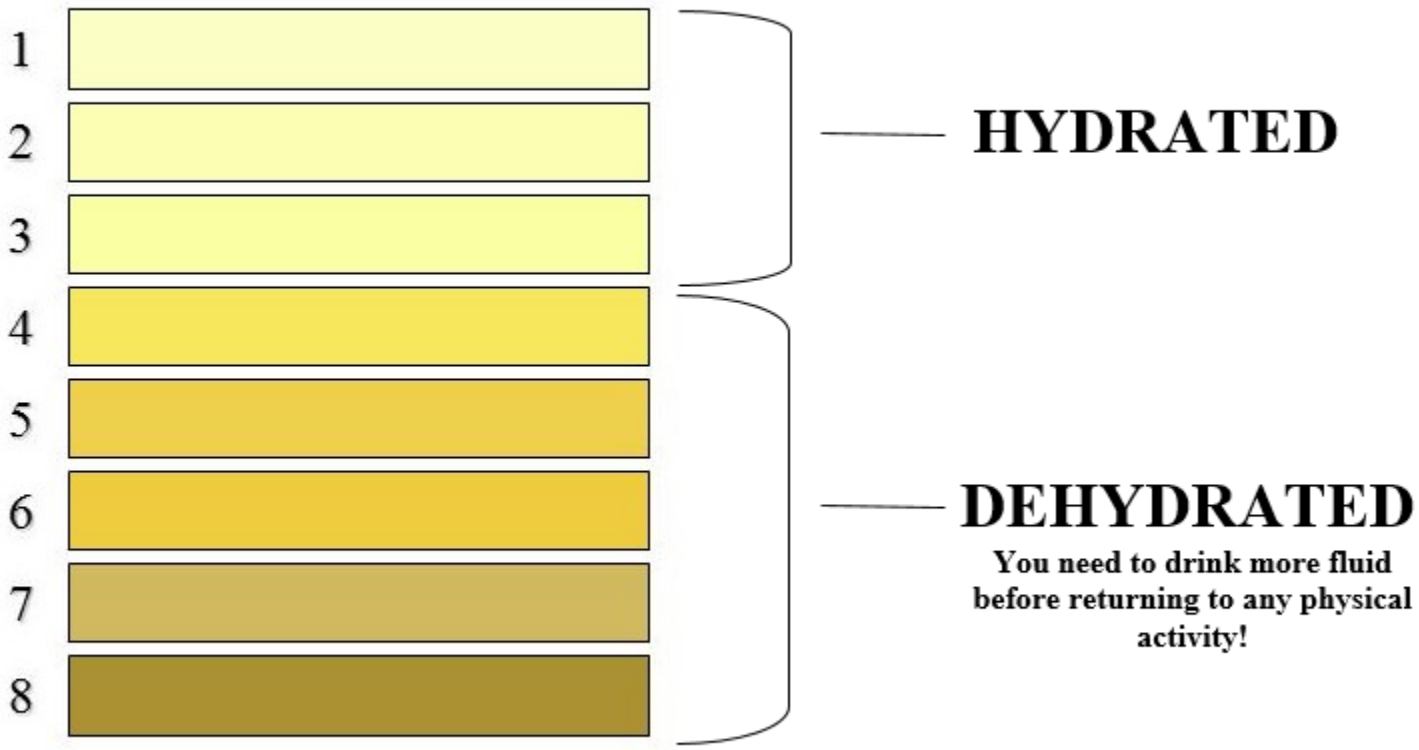
Hyponatremia is a rare, but potentially deadly disorder resulting from the over-consumption of water or other low sodium fluid (including most sports drinks). It is most commonly seen during endurance events, such as marathons, when participants consume large amounts of water or other beverages over several hours, far exceeding fluid lost through sweating. The water in the blood and the sodium content of the blood is consequently diluted to dangerous levels. Affected individuals may exhibit disorientation, altered mental status, headache, lethargy and seizures. A confirmed diagnosis can only be made by testing blood sodium levels. Suspected hyponatremia is a medical emergency and EMS (Emergency Medical Services) must be activated. It is treated by administering intravenous fluids containing high levels of sodium.

HYDRATION RECOMMENDATIONS

Before Exercise	Drink 16 oz. of fluid before activity/exercise (2 hours) Drink another 8-16 oz. of fluid 10-15 minutes before exercise
During Exercise	Drink 4 - 8 oz. of fluid every 15-20 minutes
After Exercise	Drink 16-20 oz. of fluid for every (one) pound lost during exercise to achieve normal fluid state and not begin the next practice dehydrated. Rehydration should take place over a safe and comfortable period of time. Excessive fluid intake over a short amount of time can be dangerous (see hyponatremia information below).
Fluid counter	 24 oz. of fluid = 1 ½ of water bottle 16 oz. of fluid = 1 full water bottle 7 oz. of fluid = ½ full water bottle or 10 BIG gulps of water 4 oz. of fluid – ¼ full water bottle or 5 BIG gulps of water

URINE COLOR CHART

This urine color chart is a simple tool you can use to assess if you are drinking enough fluids throughout the day to stay hydrated.



Be Aware! If you are taking vitamin supplements they can change the color of your urine for a few hours, making it bright yellow or discolored.

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

MANAGEMENT

- ► Remove excess clothing/equipment
- ► If conscious give WATER or a sports drink slowly.
- ► Based on symptoms it may be recommended the athlete waits 24-48 hours before returning to play.
- ► Move to a cool shaded area
- ► Cover the extremities and trunk with ice towels or ice bags
- ► 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 (approx. 50°F) 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.
- Altered level or loss of consciousness
- Profuse sweating or hot,red,dry skin
- Dry mouth
- Irritability/emotional instability
- Dizzy
- Stagger/inability to walk
- Poor performance
- Nausea/vomiting/diarrhea
- Headache
- Fast pulse, quick breathing, low blood pressure

MANAGEMENT

- ► Heatstroke is ***life-threatening***, activate EMS, call 911 and maintain the ABC's (airway, breathing and circulation). Continue to monitor vital signs.
- ► Remove excess clothing/equipment
- ► 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.
- ► **COOL FIRST, TRANSPORT SECOND**. Move athlete to the cooling area and immerse in cold tub (approx. 50°F) 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.

Click HERE for additional information regarding exertional heat illness and rapid body cooling.

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

KSHSAA RECOMMENDED EXCESSIVE HEAT/HUMIDITYACTIVITY 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	– 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	– 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	– 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°	– Heatstroke highly likely – No outdoor practices or practices in un-air conditioned facilities should be permitted
– 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.

EMERGENCY ACTION PLAN

SPORT & VENUE: **PRIMARY PHONE:**

VENUE ADDRESS:

AMBULANCE ACCESS TO VENUE:

AED ONSITE & AVAILABLE FOR IMMEDIATE ACCESS ☐ **AED LOCATION:**

STORM SHELTER LOCATION FOR ATHLETES & COACHES:

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**
Athletic Trainer		
Team Physician		
Coach		
Coach		
Principal		
Athletic Director		
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

2. 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: _____

3. 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

REFERENCES

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The information in this document is provided by the Kansas State High School Activities Association's Sports Medicine Advisory Committee. The information is intended to provide general information and guidelines for schools to consider when creating or updating their school's heat/hydration policy.

Disclaimer: ***The information provided by the Kansas State High School Activities Association regarding heat illness and hydration is not intended to be exhaustive or all of the relevant information on the subjects. The KSHSAA feels that the sources of the information provided above are very reputable and therefore will provide valuable source material to member schools. At the same time, schools may want to consider other available sources of relevant information and are encouraged to consult with health care professionals regarding these topics.***

UPDATED & APPROVED KSHSAA SMAC, OCTOBER 2017; APPROVED KSHSAA EXECUTIVE BOARD, NOVEMBER 2017

APPROVED KSHSAA SMAC, MAY 2015