

POLICY- SPORTS MEDICINE - KMA/KHSAA PROCEDURE FOR AVOIDING HEAT INJURY/ ILLNESS THROUGH ANALYSIS OF HEAT INDEX AND RESTRUCTURING OF ACTIVITIES AND RECOMMENDATIONS FOR COOLING METHODS DUE TO HEAT RELATED ILLNESS.

Original procedure developed by the Kentucky Medical Association Committee on Physical Education and Medical Aspects of sports to and for the Kentucky High School Athletic Association and adopted by the KHSAA Board of Control as recommendation for all schools, May 2002, On-site procedures revised by KHSAA Board of Control, February 13, 2003, On-site procedures further revised and made mandatory for all schools by the KHSAA Board of Control, May 2005, On-site procedures further revised with respect to testing instruments, March 2007, Cooling Procedures modified as recommended by Kentucky Medical Association, June 2009, Heat Index expanded to spring sports, August 2010, Revised, April, 2016

Sec. 1) INTRODUCTION

- a) Following months of study, after one year of implementation and in an effort to help protect the health and safety of student-athletes participating in high school sports, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of sports issued a recommended procedure to the Kentucky High School Athletic Association for immediate implementation in 2002. This procedure called for the determination of the Heat Index (using on-site devices to measure Temperature and Relative Humidity), and a guideline for activity to be conducted at that time based on the Heat Index reading. Though other procedures and measurements were considered, the application of the Heat Index appeared to be most readily implementable on a statewide basis, and appeared to be reliably tested in other areas.
- b) Through the first five years of use of the procedure, minor adjustments were made in the reporting requirements, and the on-site devices to be used. In May 2005, the Board of Control through its policies directed that all member schools comply with the testing and reporting requirements. In October 2006, the member schools of the Association overwhelming approved at their Annual Meeting, a proposal to make such reporting not simply a Board of Control policy, but a school supported and approved Bylaw as it approved Proposal 9 to amend the KHSAA bylaws. In March 2007, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of sports recommended the elimination of all devices with the exception of the Digital Sling Psychrometer as a means of measuring at the competition/practice site. In June 2009, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of sports recommended that specific cooling procedures, including the practicing in the event of an emergency, be implemented at the local school level. In August 2010, the Kentucky Medical Association Committee on Physical Education and Medical Aspects of sports recommended that the heat index monitoring procedures apply to the sports played in the spring in Kentucky's high schools.
- c) Each of these recommendations were adopted by the KHSAA Board of Control.

POLICY- SPORTS MEDICINE - GENERAL HEAT INDEX AND WBGIT MONITORING PROCEDURES

Sec. 1) ON-SITE DATA

- a) The policy calls for the determination of the Temperature and Relative Humidity at the practice/contest site. While the gold standard for heat index measurement is the Wet Bulb Globe Temperature (WBGT), the KHSAA has adopted the use of the Digital Sling Psychrometer as the measurement instrument for heat index as the next best available and most cost effective alternative. This is an accurate measurement of the heat index at the competition or practice site. Measurements using a digital sling psychrometer shall adhere to the following provisions:
 - (1) The measurements are to be taken ONLY using the digital sling psychrometer or wet bulb globe. There is no website, phone app or other computer programs that can substitute

and allow a school to remain in compliance. Only on site readings are valid.

- (2) It is important to note that media-related temperature readings (such as the Weather Channel, local radio, etc.) or even other readings in the general proximity are not permitted as they may not yield accurate results when considering the recommended scale, and there is no website, phone app or other computer programs that can substitute and allow a school to remain in compliance;
- (3) The readings must be made at the site and readings from alternative locations (Weather Channel, other schools) are not valid; and
- (4) It is noted that the WBGT (Wet Bulb Globe Temperature) is the "gold standard" for heat determination. However due to lack of statewide funding for WBGT devices, the heat index is the selected alternative.

- b) Neither the KHSAA nor KMA has endorsed any particular brand of Sling Psychrometer or Wet Bulb Globe Temperature Measuring Device and receives no endorsement fee or other consideration for any device sold. There are several models on the market that will properly perform the functions. The KHSAA or your local certified/licensed athletic trainer has easy access to catalogs with this type of equipment.

Sec. 2) INDOOR AND OUTDOOR VENUES

- a) Heat Index or WBGT monitoring requirements and restrictions apply (and have always applied) to outdoor and indoor sports. While much of the original discussion centered on outdoor sports, indoor sports, particularly in times of year or facilities where air conditioning may not be available, should be included in the testing. Such has been approved by the Board of Control as policy requirement.
- b) The recommendations contained in this package cover both indoor and outdoor activity, as well as contact and non-contact sports.

Sec. 3) SUMMARY OF HEAT INDEX OR WBGT MONITORING

- a) Though much more scientific information and other alternative methods for determining Heat Index and Wet Bulb Globe Temperature and participation restrictions are being studied, these initial steps should help ensure the health and safety of the participants in high school sports.
- b) Adherence to these guidelines represents a conscious effort by the interscholastic community to emphasize health and safety on a much higher level than any loss of competitive preparation. Any further revisions or enhancements will be distributed to the members of the KHSAA.

Sec. 4) PROCEDURE FOR TESTING

- a) The readings are to be taken at the exact location of practice at the specific competition/practice area where the activity will occur. NOTE: This is especially important with the proliferation and expansion of artificial playing surfaces where the heat is increased by the under layer below the carpet.
- b) Thirty (30) minutes prior to the start of activity, temperature and humidity or WBGT readings should be taken at the specific practice/competition-site.
- c) The information should be recorded on KHSAA Form GE20 and these records shall be available for inspection upon request. All schools will be required to maintain this form in either a paper or electronic format.
- d) The temperature and humidity should be factored into the Heat Index Calculation and Chart and a determination made as to the Heat Index or WBGT. If schools are utilizing a Digital Sling Psychrometer that calculates the Heat Index, that number may be used to apply to the activity alternation table. Likewise, schools using a Wet Bulb Glove Temperature Device can apply that reading to the activity alteration table.
- e) If a reading is determined whereby activity is to be decreased (above 95 degrees Heat Index), then re-readings would be required every thirty (30) minutes to determine if further activity should be eliminated or preventative steps taken, or if an increased level of activity can resume.

POLICY- SPORTS MEDICINE - HEAT INDEX AND ACTIVITY ALTERATION TABLE

Using the following scale, activity must be altered and/or

eliminated based on this Heat Index as determined:

Sec. 1) Under 95 degrees Heat Index or WBGT 92.0 to 86.9

a) All sports

- (1) Water should always be available and athletes be able to take in as much water as they desire;
- (2) Optional water breaks every 30 minutes for 10 minutes in duration to allow hydration as a group;
- (3) Have towels with ice for cooling of athletes as needed;
- (4) Watch/monitor athletes carefully for necessary action; and
- (5) Re-check temperature and humidity every 30 minutes if temperature rises in order to monitor for increased Heat Index.

Sec. 2) 95 degrees to 99 degrees Heat Index or WBGT 87.0 to 89.9

a) All sports

- (1) Water should always be available and athletes should be able to take in as much water as they desire;
- (2) Mandatory water breaks every 30 minutes for 10 minutes in duration to allow for hydration as a group. In sports or sport-activities with multiple simultaneous contests or practices, the required monitoring and rest breaks shall be taken at the same time for all contests or practices;
- (3) All breaks shall be taken in areas outside of direct sunlight;
- (4) Have towels with ice for cooling of athletes as needed; and
- (5) Watch/monitor athletes carefully for necessary action.

b) Additional Steps for Contact sports and activities with additional required protective equipment:

- (1) Helmets and other required equipment (by rule) should be removed when athlete not directly involved with competition, drill or practice, and it is not otherwise required by rule;
- (2) Reduce time of outside activity. Consider postponing practice to later in the day; and
- (3) Re-check temperature and humidity every 30 minutes to monitor for increased Heat Index.

Sec. 3) 100 degrees (above 99 degrees) to 104 degrees Heat Index or WBGT between 90.0 and 91.9

a) All sports

- (1) Water should always be available and athletes should be able to take in as much water as they desire;
- (2) Mandatory water breaks every 30 minutes for 10 minutes in duration to allow for hydration as a group. In sports or sport-activities with multiple simultaneous contests or practices, the required monitoring and rest breaks shall be taken at the same time for all contests or practices;
- (3) All breaks shall be taken in areas outside of direct sunlight;
- (4) Have towels with ice for cooling of athletes as needed;
- (5) Watch/monitor athletes carefully for necessary action;
- (6) Alter uniform by removing items if possible and permissible by rules;
- (7) Allow for changes to dry T-shirts and shorts by athletes at defined intervals;
- (8) Reduce time of outside activity as well as indoor activity if air conditioning is unavailable; and
- (9) Postpone practice to later in day.

b) Additional Steps for Contact sports and activities with additional required protective equipment:

- (1) If helmets or other protective equipment are required to be worn by rule or normal practice, suspend practice or competition immediately and resumption may not occur until the index is 99 degrees or below;
- (2) For sports that do not have mandatory protective equipment, reduce time of outside activity and consider postponing practice to later in the day; and
- (3) Re-check temperature and humidity every 30 minutes to monitor for changes in Heat Index.

Sec. 4) Above 104 degrees Heat Index or over 92 WBGT

a) All sports

- (1) Stop all outside activity in practice and/or play, and stop all inside activity if air conditioning is unavailable.

Sec. 5) Continual Usage of Procedure

- a) This procedure is to be used until such time as the temperature is below 84 degrees as no combination of heat and humidity at that level will result in a need to curtail activity.
- b) The KHSAA will use September 15 as the standard date for the recording of the Heat Index forms in the fall, and April 15 as the start date in the spring.

c) Member schools should remember that the monitoring shall continue any time that a combination of heat and humidity at that level could result in a need to curtail activity (an ambient temperature of 83 degrees or higher).

POLICY- SPORTS MEDICINE - COOLING METHODS DUE TO HEAT RELATED ILLNESS

Sec. 1) EXERTIONAL HEAT STROKE

- a) Exertional heat stroke (EHS) is relatively uncommon among exercise associated medical conditions, but is a frequent cause of exercise related death.
- b) The majority of medical evidence shows that early implementation of body cooling is the most effective method of decreasing mortality in EHS.
- c) Recommendations regarding the methods of body cooling, including tubs, ice bags, iced towels (towels with water that have been frozen) water, fans, and shade have been considered.
- d) The recommendations are classified as essential (foundational to the implementation of treatment, should have resources and personnel directed towards implementation), and desirable (important in maximal implementation, should have resources and personnel directed towards implementation as budget and resources allow).
- e) The recommendations are only guidelines, are not intended as a standard of care, and should not be considered as such.
- f) These guidelines should be considered in the care of athletes who can be expected to be at risk of EHS due to the sport or the environmental situation of the activity.
- g) Sports especially at risk include football, with and without equipment, soccer, and long distance track. Other sports and activities, such as cycling, golf, baseball, tennis, track and field, and band, may also be at risk due to long duration exposure to extreme environmental conditions.
- h) It is essential and required that the school and school officials:
 - (1) Establish a written plan for emergency treatment of EHS, and conduct drills in the implementation of the plan;
 - (2) Know how to assess environmental conditions and determine when extreme conditions exist;
 - (3) Identify a specific spot at the athletic facility that has shade;
 - (4) Have immediate access to ice and bags to contain ice;
 - (5) Have access to water, and provide water breaks; and
 - (6) Know the most effective sites for application of ice to the body.
- i) It is required that the school and school officials:
 - (1) Obtain and use, when environmental conditions are determined to be extreme, a tub or pool;
 - (2) That the tub be filled with water and ice is available before practice or game, to be used in body immersion for maximal cooling, and have personnel trained in this technique;
 - (3) That this tub be large enough to place an athlete into the cold, ice and water filled tub and cool the athlete ensuring that both the groin and armpits are in the cooling ice and water;
 - (4) That the athlete must be monitored at all times when in the cooling tub, with individuals designated to control the head and neck at all times in case the athlete becomes unconscious;
 - (5) That the emergency plan ensures that cooling of an athlete that is showing signs and symptoms of exertional heat illness is begun immediately including the availability of cold, iced towels, etc.; and
 - (6) That the emergency plan including the re-stating and practicing of the fundamental principle that the objective is to cool first, transport second and that the potentially impacted athlete should be monitored continuously until appropriate emergency personnel arrive on the scene. A good example of those principles can be found at <https://www.youtube.com/watch?v=X1-g3dVVvaM&feature=youtu.be>
- j) It is highly desirable that schools and school officials:
 - (1) Have a certified/licensed athletic trainer on staff to develop and implement these guidelines;
 - (2) Have immediate access to water and ice at all times;
 - (3) Provide shade breaks;
 - (4) Provide fans when environmental conditions are determined to be extreme;

- (5) Have close access to an air conditioned room; and
- (6) Have access to and use iced towels that can be rotated to appropriate areas of the body, including the axilla, groin, and back of the neck.

k) It is desirable that schools and school officials:

- (1) Have trained and authorized medical personnel in place to be able to monitor the rectal temperature of an athlete in an appropriate contained environment in the event of a heat emergency where an athlete is placed in a cooling tub or a suitable and accepted alternative to monitoring the temperature to ensure the effectiveness and timeliness of treatment until appropriate emergency personnel arrive on the scene; and
- (2) Have trained and authorized medical personnel routinely review and update the school's emergency action plan for athletic emergencies.

Sec. 2) REFERENCES

- a) Binkley HM et al. NATA Position statement: Exertional heat illness. *J Ath Training* 2002; 37: 329- 343.
- b) Casa DJ et al. Survival strategy: Acute treatment of exertional heat stroke. *J Strength Conditioning Res* 2006; 20: 462.
- c) Armstrong LE et al. ACSM position stand: Exertional heat illness during training and competition. *Med Sci sports Exerc* 2007; 41: 556- 572