

POLICY- SPORTS MEDICINE - AVOIDING HEAT INJURY/ILLNESS, HEAT INDEX AND MONITORING

SEC. 1) INTRODUCTION

- a) This procedure requires Analysis of Wet Bulb Globe Temperature (WBGT) or Heat Index, and Restructuring of activities and recommendations for cooling methods due to heat-related illness. b) Original procedure developed by the Kentucky Medical Association Committee on Physical Education and Medical Aspects of Sports (KMA-SMAC) to and for the KHSAA and adopted by the KHSAA Board of Control as a 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 concerning testing instruments, March 2007, Cooling Procedures modified as recommended by KMA-SMAC, June 2009, Heat Index expanded to spring sports, August 2010, Revised, April, 2016. Revised, August, 2019. Updated, July, 2023.
- c) 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 KMA-SMAC issued a recommended procedure to the KHSAA for immediate implementation in 2002.
- d) This procedure called for determining the WBGT or Heat Index (using on-site devices to measure the conditions), and a guideline for activity to be conducted at that time based on the WBGT or Heat Index reading.
- e) Though other procedures and measurements were considered, the application of the WBGT or Heat Index appeared to be most readily implementable on a statewide basis and appeared to be reliably tested in other areas.
- f) Through the years of use of the procedure, regular adjustments were made in the reporting requirements and the on-site devices to be used.
- g) In May 2005, the Board of Control, through its policies directed that all member schools comply with the testing and reporting requirements.
- h) In October 2006, the member schools of the Association overwhelmingly 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.
- i) In March 2007, the KMA-SMAC of sports recommended eliminating all devices except the Digital Sling Psychrometer (DSP) as a means of measuring at the competition/practice site.
- j) In June 2009, the KMA-SMAC recommended that specific cooling procedures, including practicing in the event of an emergency, be implemented at the local school level.
- k) In August 2010, the KMA-SMAC recommended that the heat index monitoring procedures apply to the sports played in the spring in Kentucky's high schools.
- l) While the gold standard for heat index measurement is the WBGT, the KHSAA originally allowed the use of the DSP as the measurement instrument for heat index as the next best available and a cost effective alternative and determined they were accurate measurement of the heat index at the competition or practice site.
- m) In August 2019, a phase-in was approved to transition from the use of the DSP to the use of the WBGT as the official device for heat measure, to be fully implemented before the 2024-2025 school year.
- n) Each of these recommendations were adopted by the KHSAA Board of Control.

SEC. 2) DIFFERENCES BETWEEN WBGT DEVICES AND DSP MEASUREMENT OF HEAT INDEX.

- a) The WBGT is:
 - (1) a measure that factors in the elements of heat index (temperature and relative humidity) but estimates the effect of temperature, relative humidity, wind and solar radiation on humans; and
 - (2) is generally measured in the sun (at outdoor venues) and uses temperature, relative humidity, wind, wind speed, sun angle, cloud cover and the sun angle (at outdoor venues) to make its calculations;
 - (3) has no possible conversion chart to determine its calculation and must be a properly calibrated device to yield a single measurement accurately; and
 - (4) is the Gold standard for measuring the climate to determine if activity should be altered.
- b) The DSP Heat Index:
 - (1) is the traditional measure of what the temperature feels like to the human body when relative humidity is combined with air temperatures, also known as the apparent temperature;
 - (2) Is measured in the shade, and uses and uses temperature and relative humidity to calculate the heat index;
 - (3) may be manually calculated with accurate on-site temperature and humidity readings at the site of practice of competition.

SEC. 3) ON-SITE DATA MONITORING

- a) The policy calls for determining the Heat Index (Temperature combined with Relative Humidity or WBGT) at the practice/contest site.
- b) It is strongly recommended that member schools utilize the WBGT device for heat index in compliance with this policy, which will be the required instrument for the 2024-25 school year.

SEC. 4) DSP OR WBGT DEVICE USE

- a) Measurements using a DSP or WBGT device shall adhere to the following provisions:
 - (1) The measurements will be taken ONLY using the DSP or WBGT device.

- (2) No website, phone app or other computer programs can substitute and allow a school to remain compliant as only on-site readings are valid.
- (3) It is important to note that media-related temperature readings (such as the Weather Channel, local radio, etc.) or even other readings in 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;
 - (1) It is noted that the WBGT (Wet Bulb Globe Temperature) is the "gold standard" for heat determination, however, the digital sling psychrometer heat index is the alternative that can be considered before the beginning of the 2024-25 school year.
- b) Neither the KHSAA nor KMA-SMAC has endorsed any particular DSP or WBGT device brand and receives no endorsement fee or other consideration for any device sold.
- c) Several models on the market will adequately perform the functions.
- d) The KHSAA or your local certified/licensed athletic trainer has easy access to catalogs with this type of equipment.
- e) Indoor And Outdoor Venues
 - (1) Heat Index or WBGT monitoring requirements and restrictions apply to outdoor and indoor sports.
 - (2) While much of the original discussion centered on outdoor sports, indoor sports should be included in the testing, particularly in times of year or facilities where air conditioning may not be available for various reasons.
- f) The recommendations contained in this policy cover both indoor and outdoor activity, as well as contact and non-contact sports.

SEC. 5) PROCEDURE FOR TESTING

- a) Regardless of the device used, the measurements should be taken at any practice or contest setting where the current temperature is at or above 83 degrees.
- b) If using a WBGT device, the measurements should be taken in the sun (or the hottest part of an indoor facility) in a location where any applicable wind and solar radiation is present.
- c) If using a DSP, any readings are to be taken at the exact location of practice at the specific competition/practice area where the activity will occur.
- d) Thirty (30) minutes before the start of activity, DSP or WBGT readings should be taken at the specific practice/competition site, and periodically measured after that point until the end of the practice or competition.
 - (1) In segmented competitions (i.e. track or cross country meets), a periodic measurement is permissible (i.e. every 30 minutes);
 - (2) In segmented competitions (i.e. track and field or cross country meets), additional measurements should be taken before any race of 1600 meters or longer, even if following a periodic measurement by less than thirty (30) minutes.
- e) The measurements should be recorded on KHSAA Form GE20 and these records should be available for inspection upon request.
- f) All schools are to maintain measurement records in either a paper or electronic format for the duration of the district/school records retention schedule.
- g) If schools are utilizing a DSP, the Heat Index from the device may be used to apply to the activity alternation table.
- h) Schools using a WBGT device can apply that reading to the activity alteration table.
- i) If a reading is determined whereby activity is to be decreased (above 95 degrees Heat Index or above 86.9 WBGT), then re-readings would be required every thirty (30) minutes to determine if further activity should be eliminated or preventative steps are taken, or if an increased level of activity can resume.

SEC. 6) HEAT INDEX / WBGT MANDATORY ACTIVITY ALTERATION ,UNDER 95 DEGREES HEAT INDEX OR WBGT 86.9 AND BELOW

- 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 and a prepared cooling tub for cooling of athletes as needed;
 - (4) Watch/monitor all athletes carefully for necessary action;
 - (5) Re-check WBGT or Heat Index every 30 minutes if the temperature rises.
 - (6) Use discretion for intense or prolonged exercise;
 - (7) Watch at-risk players carefully; and
 - (8) Provide multiple rest breaks periodically each hour for at least four (4) minutes.

SEC. 7) 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 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) Maximum practice time should be two (2) hours of total activity in the area;
 - (5) Have towels with ice and a fully prepared cooling tub for cooling of athletes as needed;
 - (6) Re-check WBGT or Heat Index every 30 minutes if the temperature rises.

- (7) Use discretion for intense or prolonged exercise;
- (8) Watch/monitor athletes carefully for necessary action.

(9) Watch at-risk players carefully; and

(10) Provide multiple rest breaks periodically in each hour of at least four (4) minutes.

b) Additional Steps for Football and Boys' Lacrosse:

(1) Helmets and other required equipment (by rule) should be removed when the athlete is not directly involved with competition, drill or practice, and it is not otherwise required by rule;

(2) All protective equipment should be removed for any additional conditioning activities;

(3) If the WBGT or Heat Index rises to this level after practice has begun, players may continue to work out using uniform pants without changing into shorts, but all other equipment restrictions are in place;

(4) Reduce time of outside activity and consider postponing practice to later in the day; and

(5) Re-check WBGT or Heat Index every 30 minutes to monitor for increased Heat Index.

c) Additional Steps for Field Hockey, Girls' Lacrosse, Baseball and Softball:

(1) If the activity requires protective equipment on the participants' body (i.e., goalie or catcher gear), then adhere to the additional steps for Football and Boys' Lacrosse.

SEC. 8) 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) Maximum practice time should be one (1) hour of total activity in the area with at least twenty (20) minutes of breaks distributed through that hour;

(3) Mandatory water breaks every 30 minutes for 10 minutes to allow for hydration as a group if contests are being conducted.

(4) 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;

(5) All breaks shall be taken in areas outside of direct sunlight;

(6) Have towels with ice and a fully prepared cooling tub for cooling of athletes as needed;

(7) Watch/monitor athletes carefully for necessary action;

(8) Alter uniform by removing items if possible and permissible by rules;

(9) Allow for changes to dry T-shirts and shorts by athletes at defined intervals;

(10) Re-check temperature and humidity every 15 minutes if the temperature rises.

(11) Reduce time of outside activity as well as indoor activity if air conditioning is unavailable; and

(12) Postpone practice to later in the day.

b) Additional Steps for Football and Boys' Lacrosse:

(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 WBGT or Heat Index is below this level;

(2) No protective equipment may be worn during practice, and there may be no conditioning activities;

(3) Re-check WBGT or Heat Index every 15 minutes to monitor for changes in Heat Index.

c) Additional Steps for Field Hockey, Girls' Lacrosse, Baseball and Softball:

(1) If the activity requires protective equipment on the participants' body (i.e., goalie or catcher gear), then adhere to the additional steps for Football and Boys' Lacrosse.

SEC. 9) ABOVE 104 DEGREES HEAT INDEX OR 92 WBGT OR OVER

a) All sports

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

SEC. 10) CONTINUAL USAGE OF PROCEDURE

a) This procedure is to be used until 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 expected date for recording the GE20 forms in the fall and April 15 as the start date in the spring, but the measurements must be taken any time the conditions warrant.

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).

SEC. 11) GUIDELINES FOR HYDRATION AND REST BREAKS

a) Rest breaks may not be combined with any other type of activity and players must be given unlimited access to hydration.

b) These breaks must be held in a "cool zone" where players are out of direct sunlight.

c) When the WBGT reading is over 86, ice towels and spray bottles filled with ice water should be available at the "cool zone" to aid the cooling process and cold immersion tubs must be available for the benefit of any player showing early signs of heat illness.

d) In the event of a serious EHI, the principle of "Cool First, Transport Second" should be utilized and implemented by the first medical provider onsite until cooling is completed (core temperature of 103 or less).

e) For football, helmets should be removed during any rest time.

SEC. 12) 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) Most 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, boys' lacrosse, soccer, and long distance track. Other sports and activities, such as cycling, golf, baseball, lacrosse, 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 rehearsal related to 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 containing 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) The emergency plan includes 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.

(7) A good example of those principles can be found at <https://www.youtube.com/watch?v=X1-g3dVVvaM&feature=youtu.be>

(8) Have trained and authorized medical personnel routinely review and update the school's emergency action plan for athletic emergencies.

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 additional water and ice at all times;

(3) Provide shade breaks;

(4) Provide cooling 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.

SEC. 13) SUMMARY OF HEAT INDEX OR WBGT MONITORING AND HEAT ILLNESS PREPAREDNESS

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.