



**Model Policy for Preseason-Practice  
Heat Acclimatization Guidelines for  
Student-Athletes**

# **Model Policy for Preseason-Practice Heat Acclimatization Guidelines for Student-Athletes Committee**

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## **Heat Acclimatization Guidelines Introduction**

Each year high school athletes experience serious injury and even death as a result of heat-related illnesses. It has become a major concern in that the number of deaths over the last 15 years has remained constant. That statistic becomes more alarming given that heat-related illness and death are almost entirely preventable. The need to dramatically increase awareness of the issue, recognize the symptoms of heat illness and treatment of suspected cases has become a primary consideration for early season practice routines.

The Maryland General Assembly recognized the potential for ameliorating risk and has provided legislation to address the problem. This document is offered to Maryland schools to assist in the formation of local guidelines to address heat acclimatization. It was formatted through a collaborative effort of representatives from the Maryland State Department of Education (MSDE), Department of Health and Mental Hygiene (DHMH), Local School Systems, Maryland Public Secondary Schools Athletic Association (MPSSAA), Maryland Athletic Trainers Association (MATA) and Licensed Physicians who treat student-athletes.

The contents of this document include education of coaches, parents, athletic administrators and student-athletes; important definitions; hydration awareness; environmental and non-environmental risk factors; heat acclimatization timeline; and a basic emergency plan. The guidelines attempt to strike a safe balance between a gradual introduction and assimilation into athletic competition with the need to properly teach safe playing techniques. The mitigation of other serious injuries must also be considered in any pre-season practice format.

Each school system is encouraged to carefully consider this model policy when formulating specific guidelines for acclimatization of athletes to warm weather conditions. Resources for all sections of this document may be found on the Health and Safety page of [MPSSAA.org](http://MPSSAA.org).

## Education

Coaches, Parents and Students play a critical role in understanding the dynamics associated with heat related illnesses. For many, the concept of heat acclimatization is a vague term. Likewise, the awareness of hydration and/or heat related emergency procedures are also limited among the general population. Raising the awareness level of the components of heat related illness should be a priority of each school athletic department.

Educational initiatives on multiple fronts should be undertaken to reach the greatest level of saturation. The National Federation of State High School Associations (NFHS) online course entitled, “A Guide to Heat Acclimatization and Heat Illness and Prevention” ([www.nfhslearn.com](http://www.nfhslearn.com)) provides a highly recommended guide to understanding the issue. The course is free, requires less than a half hour of time and becomes operational by July 15, 2012. In addition, the Center for Disease Control (CDC) provides information in a document entitled, “Extreme Heat - A Prevention Guide to Promote Your Personal Health & Safety.”

The CDC, Maryland Athletic Trainers Association (MATA) and National Athletic Trainers Association (NATA) also offer other courses and provide downloadable information. Any opportunity to educate coaches, parents and students to heat related illness should be taken. In-service education, team meetings, student/parent orientation meetings, coach/parent pre-season meeting, expert consultants, public reminders and the distribution of literature are delivery methods that should be considered to elevate public awareness.

### **Suggested guidelines for local consideration:**

- Consider requiring completion of NFHS Course for coaches or provide continuing education to coaching staff.
- Provide handout materials formulated by CDC to parents at pre-season meetings.
- Agenda item at team meeting for each fall sport.
- Topic at PTA meeting.
- Placement of pertinent material on MPSSAA website and links to related sites.
- Public Service announcement at games and on playoff radio and TV broadcast.
- Ads in Championship Programs.

## Resources on Education

- NFHS Education Course “A Guide to Heat Acclimatization and Heat Illness and Prevention” – [www.nfhslearn.com](http://www.nfhslearn.com)
- Center for Disease Control (CDC) “Extreme Heat - A Prevention Guide to Promote Your Personal Health & Safety” - [http://www.cdc.gov/nceh/hsb/extreme/Heat\\_Illness/index.html](http://www.cdc.gov/nceh/hsb/extreme/Heat_Illness/index.html)
- [NFHS Position Statement: Hydration to Minimize the Risk for Dehydration and Heat Illness](#)
- [NFHS Heat Acclimatization and Heat Illness Prevention Position Statement](#)
- [NATA Position State: Fluid Replacement for Athletes](#)
- [NATA Position Statement: Exertional Heat Illnesses](#)
- [NATA Consensus Statement on Heat-Acclimatization Guidelines](#)

## Important Definitions

For the purpose of this document the following definitions will be used to provide meaning and further interpretations of the guidelines. Definitions for heat acclimatization, practice, and recovery period were derived directly from House Bill 1080 while the definition of a walk-through comes from the National Athletic Trainers Association Preseason Heat-Acclimatization Guidelines for Secondary School Athletics.

**Heat Acclimatization** – Enhancing an individual’s exercise heat tolerance and ability to exercise safely and effectively in warm to hot conditions.

**Practice** – A period of time a student-athlete engages in physical activity during a coach-supervised, school-approved sports- or conditioning-related activity, including warm-up, stretching, weight training, and cool-down periods.

**Walk-Through** – A teaching opportunity when an athlete is not wearing protective equipment, including helmets, shoulder pads, catcher’s gear, or shin guards, or using other sports-related equipment (eg, footballs, lacrosse sticks, blocking sleds, pitching machines, soccer balls, marker cones).

**Recovery Period** – the time between the end of one practice or walk-through and the beginning of the next practice or walk-through.

**Hydration** – The process of drinking fluid to restore fluid levels in the body to avoid poor performance, muscle cramps, dizziness, fatigue, and other heat related illness.

## Hydration Awareness

The purpose of proper hydration in regard to the overall safety and conditioning to a student-athlete is a key part of a successful high school athletic program and one of the most preventable ways to combat heat illnesses. The responsibility to prevent injury and to successfully hydrate student-athletes is shared among the student-athlete, coaching staff, and athletic trainers.

Many student-athletes are not educated on the need and do not voluntarily drink enough water to prevent significant dehydration during physical activity. National recommendations suggest student-athletes drink regularly throughout all physical activities. An athlete cannot always rely on his or her sense of thirst to sufficiently maintain proper hydration.

### **Suggested guidelines for local consideration:**

- Readily available and unlimited amounts of water during practice and designated breaks.
- Drink before, during, and after practice and games. For example:
  - Drink 16 ounces of fluid 2 hours before physical activity.
  - Drink another 8 to 16 ounces 15 minutes before physical activity.
  - During physical activity, drink 4 to 8 ounces of fluid every 15 to 20 minutes (some athletes who sweat considerably can safely tolerate up to 48 ounces per hour).
- After physical activity, drink 16 to 20 ounces of fluid for every pound lost during physical activity to achieve normal hydration status before the next practice or competition.
- Student-athletes who do not properly rehydrate their bodies between practices run the risk of cumulative dehydration. Cumulative dehydration develops insidiously over several days and raises the risk for heat illness, especially in the first few days of acclimatization. (See NATA position statement on Fluid Replacement for Athletes).
- Student-athletes can monitor their hydration level by the color and volume of urine. Small amounts of dark urine indicates the need to drink more, while a “regular” amount of light colored urine is normal and indicates the student-athlete is well hydrated. A urine chart, such as the one used by the University of Maryland, should be posted so that student-athletes can access their individual hydration.
- Weight charts should be utilized to assess an athlete’s weight loss and hydration status. Weights should be taken prior to and after practice.
- Athletic trainers, if available, should assist in the monitoring of student-athletes during times where athletes are becoming acclimated to a new sports season and when temperatures are high.

## **Resources on Hydration**

- [NFHS Position Statement: Hydration to Minimize the Risk for Dehydration and Heat Illness](#)
- [NFHS Heat Acclimatization and Heat Illness Prevention Position Statement](#)
- [NATA Position State: Fluid Replacement for Athletes](#)
- [NATA Position Statement: Exertional Heat Illnesses](#)
- [Hydration Color Chart](#)



## **Environmental and Non-Environmental Risk Factors**

Enacting guidelines to fit every situation is problematic when individual and local differences often render unique circumstances. Local school systems should be prepared to make interpretations and err on the side of caution when dealing with unique circumstances.

The guidelines recommended for local consideration are minimum requirements designed to acclimatize student-athletes so they can participate effectively in warm and hot conditions and reduce the risk of heat related illnesses. However, environmental and non-environmental risk factors can increase the risk of heat illness per individual participant and per individual school. Local school systems are recommended to be educated, aware, and enact policy when needed to address environmental and non-environmental risk factors.

### **Environmental Risk Factors**

School systems are encouraged to assess the environmental conditions for each day of practice and have policies in place depending on the assessment of the conditions. The more humid and hot conditions are on any given day of practice, the higher the risk is for heat illness and appropriate modifications to the practice schedule may be necessary.

Air temperature, combined with humidity, wind speed and the amount of radiant heat are all contributing environmental factors that can increase the risk of heat illness.

### **Resources for Environmental Risk Factors**

- [NATA Position Statement: Exertional Heat Illness](#)
- The NOAA national Weather Service's Heat Index Chart: <http://www.nws.noaa.gov/om/heat/index.shtml>

### **Non-Environmental Risk Factors**

The inter-association task force on exertional heat illnesses consensus statement details factors that may increase the risk associated with participation in the heat for individual students. During moderate exercise, 70 to 90 percent of the energy produced by the body is released as heat. There are a number of factors that can hamper heat dissipation and put an athlete at increased risk for heat illness. The NFHS Sports Medicine Advisory Committee (SMAC) lists the following non-environmental risk factors.

#### **Risk Factors:**

- **Clothing and Equipment.** Clothing and equipment inhibit heat loss from the body and increase the risk for heat illness. Dry clothing and equipment absorb sweat and prevent evaporative heat loss. Dark clothing or equipment produces radiant heat gain. Clothing and equipment decrease convective heat loss by interfering with air contact with the

body. During periods of high WBGT or Heat Index, the risk of heat illnesses increases when clothing and equipment are worn. Thus, risk may be minimized through removing equipment and participating in drills wearing shirts and shorts only. Given that a great deal of heat is radiated from the head, helmets should be removed early on in hot and humid conditions.

- **Age** — Children acclimatize to heat more slowly and are less effective in regulating body heat than adults.
- **Dehydration** — It has been shown that moderate levels of dehydration (3-5% of body weight) can cause a significant decrease in performance and predispose an athlete to exertional heat illness. Lack of sufficient water to be released by the sweat glands makes it very difficult for the body to dissipate heat through evaporation. Thirst is a poor indication of hydration. (See more in the Hydration Section)
- **Pre-activity Hydration Status** — Athletes who begin activity in an already dehydrated state are at increased risk for exertional heat illness. Pre-activity hydration status may be compromised by inadequate rehydration following previous session, alcohol consumption, rapid weight loss regimes (i.e., wrestling), and febrile or gastrointestinal illness (vomiting or diarrhea).
- **High Body Fat** — Athletes with a high percentage of body fat are at increased risk for heat illness, as fat acts to insulate the body and decreases the body's ability to dissipate heat.
- **Poor Acclimatization/Fitness Level** — Those not yet acclimatized to the heat or inadequately conditioned are at increased risk.
- **Febrile Illness** — A fever increases core temperature and decreases the ability of the body to compensate. It is dangerous to exercise with a fever, especially when Wet Bulb Globe Test (WBGT) is high. Athletes with a fever, respiratory illness, vomiting or diarrhea should not exercise, especially in a hot environment.
- **Medications** — Amphetamines (including ADHD medications), ephedrine, synephrine, ma huang and other stimulants increase heat production. Some medications have anti-cholinergic actions (amitriptyline, Atrovent) resulting in decreased sweat production. Diuretics can produce dehydration. Athletes taking medication for ADHD should be monitored closely for signs and symptoms of heat illness.
- **Sickle Cell Trait** — Athletes with sickle cell trait (SCT) are at increased risk for a sickling crisis with exercise during hot weather. Special precautions should be taken in hot and humid conditions for athletes with SCT

- **Prior Heat Illness History** – the risk factor for individuals with a prior history of heat related illnesses is higher. Decreased heat tolerance may affect 15 percent of athletes with a history of previous heat illness.

Additional non-environmental risk factors can be found in the consensus statement by the inter-association task force. Education and understanding of these considerations is recommended for school systems.

#### **Resources for Non-Environmental Risk Factors**

- [NATA Position Statement: Exertional Heat Illness](#)
- [NFHS SMAC Heat Related Illness](#)

## Heat Acclimatization Period

The implementation of any heat acclimatization guidelines should take into account an acclimatization period that defines the duration, intensity and number of required practices to acclimatize each individual student-athlete. The duration and intensity for practices are suggested to gradually increase the student-athlete's heat tolerance, enhance their ability to participate safely in warm and hot conditions and minimize their risk for heat related illnesses.

The body of evidence supporting heat acclimatization guidelines is extensive and led to the National Athletic Trainers Association (NATA) and an inter-association task force comprised of the American College of Sports Medicine, Gatorade Sports Science Institute, National Strength and Conditioning Association, United States Army Research Institute of Environmental Medicine, American Orthopaedic Society for Sports Medicine, American Medical Society for Sports Medicine and American Academy of Pediatrics to develop *Preseason Heat-Acclimatization Guidelines for Secondary School Athletics*.

These national guidelines serve as a basis in forming a model policy to acclimatize student-athletes to their respective environment for the safe training and participation during the preseason practice period.

Suggested guidelines for local consideration take into account the need for instructional and repetition during the preseason practice period to reduce the risk of other sport related injuries. However, no research or sound reasoning was found to deviate from the minimum requirements of the inter-association task force's policy relating to the duration, intensity and number of practices during the first five days of acclimatization. Therefore, it is in the best interest to reduce the risk of heat related illnesses by not compromising a student-athlete's acclimatization period while encouraging athletic administrators and coaches to find the most effective methods to increase and use instructional time.

Furthermore, these guidelines are recommended for fall practice where the greatest risks for heat related illnesses occur. However, athletes practicing indoors, in non-air conditioned or poorly ventilated gyms are also susceptible as are students practicing for spring sports. The guidelines are also recommended for winter and spring sports regarding the duration and intensity of practices and local school systems should evaluate whether equipment restrictions are necessary.

### **Suggested guidelines for local consideration:**

These suggested guidelines for local consideration are intended to provide direction to school teams for the suggested acclimatization of student-athletes during preseason practice period required prior to the first play date.

- **General Guidelines**

- On single-practice days, one walk-through is permitted.

- Double practice days (beginning no earlier than practice day 6) must be followed by a single-practice day or rest day. When a double-practice day is followed by a rest day, another double-practice day is permitted after the rest day.
- All practices and walk-through sessions must be separated by three hours of continuous rest.
- If a practice is interrupted by inclement weather or heat restrictions, the practice should recommence once conditions are deemed safe, but total practice time should not exceed its limitations.
- Equipment Restrictions
  - Football
    - Practice days 1 and 2 – helmets only, and shorts/t-shirts
    - Practice days 3 through 5 – helmets and shoulder pads only. Contact with blocking sleds and tackling dummies may be initiated.
    - Beginning practice day 6 – full protective equipment and full contact may begin.
  - Field Hockey
    - Practice days 1 and 2 – Goalies in helmet and goalie kickers, athletes may wear shin guards, goggles and mouth pieces.
    - Practice days 3 through 5 – Goalies in helmet, chest protection and goalie kickers.
    - Beginning practice day 6 – full protective equipment may be worn.
  - Soccer – Shin guards and goalie gloves can be worn beginning day 1
  - Volleyball- Knee pads may be worn beginning day 1
- The heat-acclimatization period is designed for students on an individual basis. Days in which athletes do not practice due to a scheduled rest day, injury, illness or other reasons do not count towards the heat-acclimatization period.

- **Practice Days 1-5**

- School teams shall conduct all practices within the general guidelines above as well as the following guidelines for practice days 1-5.
- School teams are limited to one practice per day not to exceed three hours in length.
- One walk-through session is permitted per day no longer than 1 hour in duration.

- **Practice Days 6-14**

- School teams shall conduct all practices within the general guidelines above as well as the following guidelines for practice days 6-14.
- Total practice and walk-through time per day should be limited to five hours with no single session longer than three hours in duration.
- School teams may participate in full contact practices with all protective equipment worn.

### Sample Practice Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						Day 1
Rest Day	Day 2	Day 3	Day 4	Day 5	Day 6 Full Contact 1 <sup>st</sup> two-a-day	Day 7
Rest Day	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13
Rest Day	Day 14	Day 15	Day 16	Day 17	First Play Date	

**Note:** Shaded days reflect Heat Acclimatization Period

#### Resources for Heat Acclimatization Guidelines

- [NATA “Preseason Heat-Acclimatization Guidelines For Secondary School Athletics”](#)
- [NATA Consensus Statement on Heat-Acclimatization Guidelines](#)

## Emergency Plan

Practicing a comprehensive hydration and acclimatization plan constitutes the best possible emergency action plan. Never-the-less, it is critical that each school have in place specific preparedness measures should they encounter a heat emergency. Knowing what to do and reviewing specific protocols could minimize potentially catastrophic injuries.

As local conditions render each school setting unique any emergency plan needs to be tailored to suit individual school needs. There are however common factors that should comprise every school emergency plan. In light of the fact that a qualified medical person might not be on hand at every game or practice, it is recommended that a simple plan be prescribed. An uncomplicated plan provides the best opportunity to be remembered and then employed in time of crises. Any single heat emergency plan should incorporate three basic components; recognition of heat illness, immediate cooling and transport via ambulance to a hospital.

A simple plan with assigned specific delegated duties could prove to be most helpful in:

- Remembering what to do
- Covering important task
- Offering the best chance for success

Each school plan should offer as a minimum three important factors and posted for all coaches and student-athletes to see.

- Preparedness
  - Coach training to recognize symptoms (NFHS Course at [nfhslearn.com](http://nfhslearn.com))
  - Materials on hand i.e. 100 gallon Rubbermaid stock tank, plastic children's pool
  - Water source and bottled water
  - Ice for water cooling or application to victim
  - Cell phone
- Emergency Treatment
  - Recognition of symptoms
  - Rapid submersion in tub or pool or application of ice under arms and to groin area
  - Transport via ambulance to hospital
  - Water consumption
- Pre-assignment of Responsibilities
  - Person to call 911 first and then parent
  - Person(s) to prepare soaking tub or pool or ice bags for topical application
  - Person(s) to assist with moving and attending injured player
  - Person to meet and escort emergency vehicle to victim
  - Person to supervise rest of the team

## References

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