Virginia Amateur Sports Weather Policy

All weather conditions as well as heat and humidity will be monitored on Games Weekend at Games Central in Lynchburg, VA.

Heat & Humidity

HEAT INJURIES CAUSE MULTIPLE DEATHS EACH YEAR IN SPORTS.

Heat illness and injury can range from a simple muscle cramp to life threatening heat stroke. Catastrophic heat injuries are preventable. Following the recommendations found in this document, the risk of heat injuries can be reduced significantly. The most important components in preventing heat injury are the prevention of dehydration and limiting activity when temperature and humidity make it near impossible for the body to cool through evaporation of sweat.

The body produces heat at rest; this heat production increases 10 to 20 times with exercise. Evaporation is the major method of cooling the body during exercise. Evaporation of sweat dissipates the heat from the core of the body, keeping the internal organs cool. Exercising in a dehydrated state reduces the ability to sweat, therefore compromising the ability to cool. Dehydration also causes a reduction in blood volume, compromising cardiac output. The air temperature and humidity have a direct effect on the efficiency of this cooling process. Based on the effects of dehydration and exercising in the heat and humidity, the following guidelines have been established to provide administrators, coaches, and athletic training staff, with a sound plan to prevent heat injury.

It is strongly recommended that each school system develops and adheres to specific heat guidelines appropriate for their student activity population and facilities based on scientific research. Guidelines should also apply to activities such as marching band and for gyms and indoor facilities without air conditioning.

Signs and Symptoms of Heat Problems:

The following are common signs and symptoms related to heat illness, but are not intended to represent a complete list. In the event an athlete is suffering from one or more of the following, the athlete should be referred to appropriate allied health care or medical professional for full evaluation.

- Muscle spasms/cramps
- Heavy or profuse sweating
- Skin is flushed or cool and pale
- Headache
- Dizziness
- Rapid pulse, nausea, weakness
- Disoriented, confusion
- Elevated body core temperature
- Cessation of sweating
- Red, dry skin
- Shallow breathing and rapid pulse
- Loss of consciousness

Heat Illness/Injury Facts:

- Adolescents take longer to acclimatize to the heat than adults
- Weight loss of water greater than 3% of body weight significantly increases the risk of heat related illness.
- 1.5 times the amount of water lost must be consumed to replace lost weight.
- Unrelated illnesses causing vomiting and/or diarrhea will increase risk of heat related illnesses. These conditions should be brought to the attention of the ATC and/or coaching staff prior to participation and close monitoring of these individuals should take place during practice sessions and competition.
- Athletes taking certain medications including diuretics, antihistamines, beta blockers and anti-cholinergics are at higher risk for heat illnesses.

- Light colored breathable clothing can assist the body in cooling.
- Athletes who are overweight, poorly conditioned, recovering from illness, lacking in sleep, or taking medications are at added risk for heat illnesses and should be monitored closely and/or have their participation level modified.

Recommendations for Fluid Replacement:

- All events should establish a Fluid Replacement Protocol for their facility. (see recommendations below) • All athletes should inform their coaches and/or athletic training staff of any pre-existing heat illness, gastrointestinal condition and/or medical complication prior to exercising in the heat.
- Weigh athletes before and after each practice during hot weather. Athletes should conform to a restricted activity schedule if not within 1% of the previous day PRE-EXERCISE weight.
- Replace fluids at a rate of 24 fluid ounces for every pound of body weight lost after exercise • Athletes should be educated in the process of hydrating themselves as a 24 hour a day process.
- Athletes should begin every athletic activity well hydrated.
- During exercise, the average person should drink 8 – 12 oz of fluid every 20 to 30 minutes.
- Urine color is an easy method to determine hydration status. Light yellow to clear urine indicates a well-hydrated athlete.
- Water should be available to athletes at all times and never be withheld from exercising individuals.

Environmental factors:

Ambient air temperature and humidity have a direct effect on the ability for a body to cool itself through the evaporation of sweat. When the air temperature is above 90, and/or the relative humidity is high, the body is at a higher risk to not effectively stay cool, which may be compounded by the level of dehydration of the body's fluids. The following chart is a simple method to determine the amount of increased risk with variations of heat and humidity, and subsequent suggestions to modify participation in physical activities.

This chart can be used by inputting the temperature and humidity available via local radio stations, Internet locations, etc. Simply cross-reference the relative humidity (top row) with the temperature (first column) to determine the humiture. Follow guidelines outlined below.

Humiture or Apparent Temperature Chart (After R.G..Steadman, 1979)

RELATIVE HUMIDITY (%)

Temp	**10%**	**20%**	**30%**	**40%**	**50%**	**60%**	**70%**	**80%**	**90%**	**100%**
105º	100	105	113	123	135	149				
104º	98	104	110	120	132	143				
102º	97	101	108	117	125	139				
100º	95	99	105	110	120	132	144			
98º	93	97	101	106	110	125	132			
96º	91	95	98	104	108	120	128			
94º	89	93	95	100	105	111	122	128		
92º	87	90	92	96	100	106	115	122		
90º	85	88	90	92	93	100	106	114	122	130
88º	82	86	87	89	93	95	100	106	115	125
86º	80	84	85	87	90	92	96	100	109	111
84º	78	81	83	85	86	89	91	95	99	105
82º	77	79	80	81	84	86	89	91	95	96
80º	75	77	78	79	81	83	85	86	89	91
78º	72	75	77	78	79	80	81	83	85	86
76º	70	72	75	76	77	77	77	78	79	80

HUMITURE	**VHSL RECOMMENDATION**
105º and up:	Recommend no outside activities.
95º to 104º:	Recommend no equipment (helmets, pads, etc) be used during activity.
90º to 94º:	Recommend equipment be removed as often as possible (during rest breaks, on sideline, etc). Careful monitoring of all athletes for signs of heat problems.

Below 89º: Recommend adequate water supply at all practices and competitions with breaks every 20 to 30 minutes for rehydration.

Fluid replacement should meet sweat rate for each individual. During prolonged intense exercise in high heat stress conditions, sweat rates may exceed the body's ability to rehydrate through ingestion of fluids. Net fluid loss experienced in these conditions must be regained within 24 hours, prior to the next practice session. Daily weigh in and weigh out is recommended to maintain awareness of overall cumulative fluid losses and appropriate rehydration or restriction of activity can be implemented.

Heat Stress Practice and Equipment Modifications

Level	Humiture	WBT	Equipment Restrictions	Work/Rest Ratio
Green – 1	<87	<75°	Full uniform	
Yellow – 2	87 – 89	75° - 76.9°	Remove helmet when not active in drill	50 min work / 10 min rest per hour
Orange – 3	90 – 94	77° - 78.9°	Remove Helmet and Shoulder Pads when not active in drill	45 min work / 15 min rest per hour
Red – 4	95 – 104	79° - 80.9°	No Equipment*	45 min work / 15 min rest per hour
Black - 5	105 +	81° +	No Outside Practice	

* Field Hockey Goalies may wear full protective equipment not to exceed 10 minute on – 20 minute off cycle for live goal tending drills.

National Athletic Trainers Association's Recommendations on Fluid Replacement:

- Educate athletes on the effects of dehydration on physical performance.
- Inform athletes on how to monitor hydration status.
- Convince athletes to participate in their own hydration protocols based on sweat rate, drinking preferences, and personal responses to different fluid quantities.
- Encourage coaches to mandate rehydration during practices and competitions, just as they require other drills and conditioning activities.
- Have a scale accessible to assist athletes in monitoring weight before, during, and after activity.
- Provide the optimal oral rehydration solution (water, CHOs, electrolytes) before, during, and after exercise.
- Implement the hydration protocol during all practices and games, and adapt it as needed.
- Finally, encourage event scheduling and rule modifications to minimize the risks associated with exercise in the heat.

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Full text can be found on NATA's website: www.nata.org

Acclimatization to Heat:

Another way to help prevent heat stress is to become acclimatized to the weather. Acclimatization means becoming adapted to the weather or climate. The process takes 7 to 12 days. Studies have shown adolescents take longer to acclimatize to heat than adults. As a result of acclimatization, the sweating mechanism of a person is enhanced:

- onset of perspiration occurs earlier
- perspiration increases
- increase in blood volume with the more training an individual does
- improves supply of oxygen to the muscles
- heart rate decreases
- core body temperature does not rise as high during exercise

Other facts about heat illnesses and exercising in the heat:

- Dehydration of 1% to 2% of body weight begins to impact athletic performance
- Dehydration greater than 3% of body weight may increase an athlete's risk of heat illness.
- Sports drinks should contain 6% carbohydrate. Carbohydrate content greater than 6% compromises the rate of gastric emptying and should be avoided.

- Wear light weight and light colored clothing. Avoid wearing articles that prevent water absorption
- Early morning commonly produces a humid environment and lower temperatures. Usually, as the sun rises, the temperature will increase and the humidity decreases. As the evening hours approach, the temperature decreases and the humidity will rise. Often, the most critical times to monitor athletes ability to exercise in hot weather occurs when the temperature rises quickly during the early morning prior to the sun burning off the humidity; or during storms when the humidity remains high due to cloud cover, etc.
- A mild breeze can reduce the humidity on a particular field, as well as improve the evaporative process.
- Field watering after practice sessions are complete can help reduce the ambient humidity on or near an athletic field, thus reducing the heat stress on athletes.

EXTRACURRICULAR ACTIVITY DURING EXTREME HOT AND HUMID WEATHER POLICY USING WET BULB THERMOMETER

Courtesy of Fairfax County Public Schools

It should be noted that wet bulb readings represent the temperature including the effect of evaporative cooling. These readings are more commonly acquired using a digital psychrometer available through medical suppliers for under $100. The use of these devices allow for more accurate monitoring of actual conditions found at an athletic facility.

Level	FWBT	Duration	Attire	Fluid Consumption	Comments
1	**Less than 60°**	3 hours maximum	Full gear	Insist that adequate fluid be ingested	Never restrict water consumption
2	**60.1° - 65.9°**	3 hours maximum	Full gear	Insist that adequate fluid be ingested	Provide minimum of 2 water breaks per hour
3	**66° - 74.9°**	3 hours maximum	Full gear	Insist that 4 – 6 oz minimum fluid be ingested every 20 minutes	Provide minimum of 3 water breaks per hour
4	**75° - 76.9°**	3 hours maximum	Remove helmets unless active in drill	Insist that 6 – 8 oz minimum fluid be ingested every 20 minutes	Monitor athletes, rest as needed.
5	**77° - 78.9°**	3 hours maximum, every 45 minutes of work > 15 minutes of rest each hour*	Protective equipment removed for non-contact drills	Insist that 8 – 10 oz fluid be ingested every 15 minutes	Removal of helmet unless active in drill, removal of pads (ie: shoulder pads) when teaching or non-contact portions of practice exceed 10 minutes in length
6	**79° - 80.9°**	3 hours maximum every 45 minutes of work > 15 minutes of rest each hour*	Shirt, shorts only No helmets or equipment	Insist that 8 – 10 oz fluid be ingested every 15 minutes.	Reduce intensity of activity, no equipment or helmets
7	**81° - up**	NO OUTDOOR PRACTICE		Re-hydrate 24 oz for every pound of body weight loss per day.	Practices conducted indoors must follow the Heat Policy

The Heat Policy also applies to indoor practice

RECOMMENDATIONS:

Fluid replacement should be at a rate of 24 oz for every pound of body weight lost after exercise.

- Light colored, loose clothing is suggested during activity in hot weather.
- Athletes are encouraged to wear sunscreen on exposed skin during hot, sunny conditions.
- Adequate fluid supply should be readily available at all times during activity in hot weather.
- Individuals poorly acclimatized, or poorly conditioned are at increased risk for heat related illness/injury and should be monitored closely or placed on a modified participation schedule.
- Athletes having a pre-existing dehydrated state (recent fever or gastro-intestinal illness) or pre-existing heat injury are at a much higher risk for heat related illness/injury and should be monitored closely or placed on a modified participation schedule.

- Medications including diuretics, antihistamines, beta blockers and anti-cholinergics increase the risk of heat illness/injury.
- Overweight athletes are at increased risk for heat illness/injury and should be monitored closely.
- Energy, ergogenic, and dietary supplements such as Creatine may cause an increase in dehydration and heat related illness and/or injury.

Heat Induced Illness Definitions and Recommendations:

Exercise Association Muscle Cramps

- Signs and Symptoms: painful "tics", "twinges", "stiffness", "tremors", and/or "contractures" as well as visible muscular involvement. There may also be sweating, thirst and/or fatigue.
    - It should be noted that in the case of sickle cell involvement there will be pain that is very similar to exercise associated muscle cramps, however, there will be a lack of visible muscular involvement. Sickle cell associated muscle pain must be treated by removing the athlete from participation as soon as possible and seeking further medical treatment.
- Contributing factors: dehydration, venous pooling of blood, electrolyte imbalances, altered neuromuscular control, fatigue, or any combination of these factors
- Procedures: Provide water or a sports drink containing electrolytes, insist that the patient rest and aid the athlete in static stretching. Icing and massaging may be used to relieve the discomfort. Monitor the athlete's condition until signs and symptoms are no longer present
- Prognosis: normally resolves in about five minutes, however in severe cases further exercise may be prohibited, further medical attention may be needed, and the athlete may experience soreness for several days

Heat Syncope

- Signs and Symptoms: fainting associated with dizziness, tunnel vision, pale or sweaty skin, and a decreased pulse rate while standing in the heat or after vigorous exercise (if there is a low rectal temperature)
- Contributing Factors: unfit or heat-unacclimated persons, dehydration, venous pooling of blood, reduced cardiac filling, low blood pressure causing resultant cerebral ischemia
- Procedures: move the patient to a shaded area and elevate legs. Proceed to monitor vital signs, cool the skin, and encourage the athlete to rehydrate when able. Refer the athlete to another medical professional to rule out any other medical conditions that could have contributed to the heat syncope episode.
- Prognosis: The athlete will likely be able to return to activity soon, however, if the athletic trainer is concerned about underlying medical conditions, the athlete may be unable to participate until obtaining clearance from an approved medical professional.

Heat Exhaustion

- Signs and Symptoms: elevated rectal temperature below 105F, red skin, heavy sweating and dehydration, excessive fatigue, fainting or collapsing with minor cognitive changes, vomiting, weakness, headache, lightheadedness, low blood pressure, and impaired muscle coordination
- Contributing Factors: cardiovascular insufficiency, hypotension, energy depletion, and central fatigue, hot and humid conditions, intense physical activity
- Procedures: Assess athlete's CNS function, remove excess clothing and equipment, move to a cool and shaded area, obtain rectal temperature, elevate legs, provide fans or ice towels/bags, and monitor vital signs
- Prognosis: If recovery does not occur within 30 minutes, the athlete will be transferred for further medical care. If the athlete does recover within 30 minutes they will not be allowed to return to play, and they will be encouraged to see a medical professional for clearance to play in the future.

Exertional Heat Stroke

- Signs and Symptoms: neuropsychiatric impairment, elevated rectal temperature at/above 105F, collapse, aggressiveness, irritability, confusions, seizures, altered consciousness o If rectal temperature is slightly below 105 F but symptoms still point toward exertional heat stroke, the athletic trainer may assume that the patient is suffering from exertional heat stroke and that the temperature has already decreased slightly.

- Do not waste time with any temperature measurement other than rectal, use other signs and symptoms to diagnose the athlete Contributing Factors:
- Inhibited heat loss
- Decreased ability to evaporate sweat o Hot and humid conditions o Intense physical activity

- Procedures: remove athlete from activity, submerge athlete's body into a pool/rub of cold water (35-59F), if this is not available substitute with ice towels/bags and cool water, remove clothing and equipment ONLY AFTER the patient is submerged or covered in ice towels/bags, obtain rectal temperature (if this is not possible do not waste time with other measurements, simply monitor other vital signs), monitor vital signs and rectal temperature, remove patient from cooling devices when rectal temperature is at 102F (if no rectal temperature assume loss of 1F every 3 minutes), if there is no physician on site, transport the athlete for further medical care at this time
- Prognosis: if there is a physician on site, and cooling was occurred immediately, and the patient is asymptomatic 1 hour after cooling, transporting the athlete to another site may not be necessary. If there is no physician on site, the athlete will be transported for further medical care. Depending on how quickly and efficiently cooling took place, the athlete may begin physical exercise within 1 month with clearance from a medical professional. However, the athlete may experience residual complications for months or years after the event.

Sources:

National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses. (n.d.). Retrieved April 7, 2017, from http://natajournals.org/doi/pdf/10.4085/1062-6050-50.9.07?code=nata-site

VHSL Heat Guidelines. (n.d.). Retrieved April 7, 2017, from http://www.christiansburg.org/DocumentCenter/View/6021

Emergency Procedures: Thunder & Lightning

These guidelines provide a default policy to those responsible or sharing duties for making decisions concerning the suspension and restarting of practices and contests based on the presence of lightning or thunder. The preferred sources from which to request such a policy for your facility would include your state high school activities association and the nearest office of the National Weather Service.

Proactive Planning

1. Assign staff to monitor local weather conditions before and during practices and contests.
2. Develop an evacuation plan, including identification of appropriate nearby safe areas.
3. Develop criteria for suspension and resumption of play:
   a. When thunder is heard or a cloud-to-ground lightning bolt is seen, the leading edge of the thunderstorm is close enough to strike your location with lightning. Suspend play for thirty minutes and take shelter immediately.
   b. **Thirty-minute rule**: Once play has been suspended, wait at least 30 minutes after the last thunder is heard or flash of lightning is witnessed prior to resuming play.
   c. Any subsequent thunder or lightning after the beginning of the 30-minute count will reset the clock and another 30-minute count should begin.
4. Review annually with all administrators, coaches and game personnel.
5. Inform student athletes of the lightning policy at start of season.

For more detailed information, refer to the "Lightning Safety" section contained in the National Federation of State High School Associations (NFHS) Sports Medicine Handbook.

Source: VHSL, revised and approved October 2014

Emergency Procedures: Tornadoes

GENERAL INFORMATION

Tornadoes usually occur in the spring and summer; they are formed by severe thunderstorms.
Considered nature's most violent and erratic storms, they consist of whirling winds of up to 300 miles per hour. Tornadoes can sweep through an area, causing serious damage and destruction. In addition to injuries and structural damage, electrical shorts, gas leaks, etc., may create fires or other hazards. Everyone must understand the terminology associated with tornado safety.

Tornado watches are issued by the Severe Storms Forecast Center in Norman, Oklahoma, in collaboration with the local National Weather Service office. The local National Weather Service issues tornado warnings.

Tornado Watch: Weather conditions are considered favorable for tornadoes to form in and near the watch area. These conditions are determined by the National Weather Service which transmits the watch information through weather radio, television and radio. When a **tornado watch** has been issued for your area, you should monitor weather radio, local radio or television for additional watches or warnings.

Tornado Warning: A tornado warning means that a tornado has been sighted by the public or local law enforcement, or that Doppler radar has indicated an area of rotation that could develop, or has developed, into a tornado.

Take shelter immediately. Remember that tornadoes can form and move quickly; therefore, there may not be adequate time to issue a warning. If severe thunderstorms occur, be alert to the fact that a thunderstorm could trigger a tornado, and **be prepared**.

TORNADO PLAN

PURPOSE:
To provide VAS staff, event coordinators, volunteers, participating athletes and spectators with guidance on the procedures to be followed when notified of a TORNADO WATCH and/or a TORNADO WARNING originating from the National Weather Service.

GOAL:
To minimize personal injury, loss of life and property damage through proactive measures.

RESPONSIBILITY:
Senior administrators (i.e. VAS staff, event directors and event coordinators) will ensure that all volunteers, participating athletes and spectators within their areas of responsibility read and receive direction to comply with this plan.

NOTE: Particular attention must be given to both volunteers (i.e., event monitors) and event coordinators to insure that they are briefed by VAS. At the time of training, each event monitor and event coordinator will be instructed to contact the event monitors at each event site where each building is located and obtain the locations of the designated shelter areas.

TORNADO WATCH

When the National Weather Service issues a tornado watch, it will be received on all Weather Alert Radio systems located in key facilities/offices of VAS. Upon hearing the announcement of a TORNADO WATCH, each event coordinator will be responsible for notifying all event monitors, teams, spectators and faculty in their event venue. The notification will include the following information/instructions:

- The VAS event is under a **TORNADO WATCH**

- Time tornado watch expires
- Normal routine will not be interrupted unless a **TORNADO WARNING** is issued
- If the weather radio or outside sirens sound indicating a tornado warning for _____ County, proceed immediately to nearest designated tornado shelter in your event building.

TORNADO WARNING

When the National Weather Service issues a tornado warning, the weather radio and/or the tornado sirens will be activated. All individuals at the event venue will proceed to the nearest designated tornado shelter area in the building where they are located. Shelter areas depend on your location at the time of the tornado warning.

IF YOU ARE IN A BUILDING, STAY IN THAT BUILDING AND GO TO THE NEAREST DESIGNATED SHELTER AREA. IF YOU ARE OUTSIDE, IMMEDIATELY ENTER THE NEAREST BUILDING AND PROCEED TO THE NEAREST DESIGNATED SHELTER AREA.

A. Event Monitors/ event personnel will:
   1. Direct occupants to proceed in a quick and orderly manner to the nearest designated shelter area in the building.
   2. Instruct occupants not to leave the building.
   3. Provide assistance to persons with disabilities.
   4. Accompany occupants to the nearest designated shelter area in the building.

B. Occupants will:
   1. Proceed to the nearest designated shelter area in the building by the quickest route.
   2. Move quickly but in an orderly manner so that all may arrive safely.
   3. Take a seat in the shelter area (if seats are not available, calmly remain standing).

REMAIN IN THE SHELTER UNTIL THE TORNADO WARNING IS OVER. THERE IS NO "ALL CLEAR" SIGNAL GIVEN; THIS INFORMATION WILL BE PROVIDED BY LISTENING TO A RADIO OR TV STATION, OR BY CONTACTING VAS STAFF.

C. Persons with a weather alert radio should bring the radio to the shelter and monitor for the expiration or continuation of the warning.

D. If you are in the open:
   1. Move at right angles to the tornado.
   2. Attempt to reach shelter, such as a building with a basement.
   3. If there is no time to escape or find shelter, lie flat in a ditch or depression, avoiding areas subject to rapid water accumulation or flooding in heavy rains.

E. Trouble areas/places to avoid:
   1. All outside walls, elevators and windows of buildings.
   2. Any low-lying area that could flood.
   3. Vehicles---do not use for shelter.
   4. Building areas with a large roof span.

- Source: Iowa State University