**Sample Exertional Heat Illness Policy & Procedures**

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| **Policy Area:** Environmental Safety | **Subject:** Exertional Heat Illness |
| **Title of Policy:** Exertional Heat illness | **Number: (This is a numbering system used by the organization)** |
| **Effective Date: (Date policy is to be implemented)** | **Page Number: (x of x)** |
| **Approved Date: (Date when policy was approved)** | **Approved By: (This area may contain a routing list of individuals****who must review and approve)** |
| **Revision Date: (Date of most recent revision)** |

1. **Purpose of policy:**

Exertional heat illness includes exercise-associated muscle cramps, heat syncope, heat exhaustion, and exertional heat stroke (EHS). Current best practice guidelines suggest that the risk of exertional heat injuries can be minimized with heat acclimatization and diligent attention to monitoring individuals participating in activities that place them at a higher risk for these types of injuries.1 In the event an athlete sustains a heat illness, immediate and proper treatment is needed.

National governing bodies, such as the National Federations of High School Associations, National Collegiate Athletic Association (NCAA) and numerous state athletic/activity associations, have published guidelines for the prevention, monitoring and treatment of exertional heat illnesses. In addition, national authorities such as the National Athletic Trainers’ Association and the Korey Stringer Institute have published research to support best practices in this area. The development of the organization’s heat acclimatization guidelines will be based on the current best practice documents.

1Casa DJ, Demartini JK, Bergeron MF, et al. National Athletic Trainers’ Association Position Statement: Exertional Heat Illnesses. *Journal of Athletic Training*. 2015;50(9):986-1000.

1. **Policy statement:**

This policy describes the best practice procedures for the prevention, monitoring, and when necessary, the treatment of exertional heat illnesses for students/athletes, faculty and staff of **[Organization Name]**.

This policy will be a living, working document, that is continually reviewed and updated yearly as the organization and our community changes.

1. **Definitions:**
* *Acclimatization* – The process ofgradually increasing the intensity of activity in a progressive manner that improves the body’s ability to adapt to and tolerate exercise in the heat.
* *Wet Bulb Globe Temperature* – The WBGT is a measurement tool that uses ambient temperature, relative humidity, wind, and solar radiation from the sun to get a comprehensive measure that can be used to monitor environmental conditions during exercise. WBGT is different than heat index, as it is a more comprehensive measurement of environmental heat stress on the body.
* *Non-Practice Activities* – Activitiesthat include meetings, injury treatment, and film study.
* *Practice* – the period of time that a student-athlete engages in coach-supervised, school approved sport or conditioning related-activity. Practice time includes from the time the players report to the field until they leave.
* *Walk Through* – A period of time where players are reviewing positional strategy and rehearsing plays. Players do not experience contact and thus they do not wear equipment and the intensity of the activity is minimal often involving walking. This period of time shall last no more than one hour. It is not considered part of the practice time regulation. It may not involve conditioning or weight room activities. Players may not wear protective equipment during the walk through.
* *Recovery Time* – This period of time is defined as non-activity time outside of practices or games. NO ACTIVITY, including non-practice activity, can occur during this time. Proper recovery should occur in an air-conditioned facility, when possible and usually is a minimum of 3 hours in duration.
* *Rest Breaks* – This period of time occurs during practice, and is a non-activity time that is in a ‘cool zone’ out of direct sunlight.
* *Exertional Heat Stroke* (EHS)– Defined as having a rectal temperature over 104°F-105°F (40.5°C), and central nervous system dysfunction (e.g. irrational behavior, confusion, irritability, emotional instability, altered consciousness, collapse, coma, dizzy, etc.).
* *Cooling Zone-* An area out of direct sunlight with adequate air flow to assist in cooling*.* A cold-water or ice tub and ice towels should be available to immerse or soak a patient with suspected heat illness This may be outdoors or indoors depending on proximity to field.
* *Qualified Health Care Professional (QHP*) - [As defined by the American Medical Association (AMA)](https://www.hcca-info.org/Portals/0/PDFs/Resources/Conference_Handouts/Compliance_Institute/2014/mon/205print3.pdf), “is an individual who is qualified by education, training, licensure/regulation (when applicable), and facility privileging (when applicable) who performs a professional service within his/her scope of practice and independently reports that professional service.”
* *Hypohydration*- (reduced hydration status) is a deficit of body water that is caused by acute or chronic dehydration.
* *Central Nervous System dysfunction*- includes any sign or symptom that the central nervous system is not working properly, including: dizziness, drowsiness, irrational behavior, confusion, irritability, emotional instability, hysteria, apathy, aggressiveness, delirium, disorientation, staggering, seizures, loss of consciousness, coma, etc.

1. **Scope:**

This policy applies to all staff members (e.g., athletic trainers, physicians, athletic administrators, coaches, strength and conditioning staff, school administrators, advisors) of **[School Name]** who are associated with activities where heat illness poses a risk, including but not limited to, outdoor and indoor activities where high temperature and specifically high humidity environmental risks are present (e.g., athletics, intramurals, course instruction, marching band).

1. **Procedures:**

**Prevention**

*Pre-participation history and physical exam*

1. A thorough medical history will be gathered (history of heat illness, sickle cell trait/disease, etc.)
2. Individuals with risk factors will be identified and counseled (see table below):
3. When applicable the Athletic Trainer or persons responsible will be notified of individuals with pre-existing conditions that place the individual at risk of exertional heat illness
4. As necessary, coaches are notified of individuals at higher risk

*Environmental Monitoring and Activity Modification/Cancellation*

1. Environmental monitoring will occur utilizing a WBGT device **[insert school device here]**
2. Environmental monitoring will occur any time it is warm outside (i.e. over 70°F)
3. Environmental monitoring and activity modifications may be necessary for certain types of indoor facilities
4. Monitoring of WBGT will occur every 30 minutes beginning at the scheduled practice time
	1. **[insert WHO (athletic trainer, athletic director, coach) will monitor the WBGT]**
	2. **[insert WHO (athletic trainer, athletic director, coach) will make the modification/cancelation of activity]**
	3. **[insert school specific protocol for where WBGT will be measured]**
	4. All environmental monitoring will be recorded **[insert school specific recording methods here – stored within device, stored in phone, hard copy record sheet, etc.]**
5. Modifications will be made in accordance with the best practice guidelines for our region. We are in [**category X]**, therefore we will follow the activity guidelines for that region.
	1. *To find what region/category your school is in, please read the Grundstein et al. Regional heat safety thresholds for athletes in the contiguous United States. Applied Geography, 2015 manuscript (*[*https://ksi.uconn.edu/wp-content/uploads/sites/1222/2018/08/RegionalWBGT\_2015\_AppliedGeography.pdf*](https://ksi.uconn.edu/wp-content/uploads/sites/1222/2018/08/RegionalWBGT_2015_AppliedGeography.pdf)*)*
	2. *The table below shows the specific modifications that will be made for each flag zone (green, yellow, orange, red, black).*
	3. *Delete the categories that do not apply to you for a clean table*
6. Modifications are meant to be fluid, meaning if the environment gets more oppressive, the modifications get stricter. However, if environmental conditions improve, the modifications will be in line with the new environmental conditions

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| Cat 3 | Cat 2 | Cat 1 | Activity Guidelines |
| < 82.0 | < 79.7 | < 76.1 | Normal Activities – Provide at least three separate rest breaks each hour with a minimum duration of 3 min each during the workout. |
| 82.2 - 86.9 | 79.9 - 84.6 | 76.3 - 81.0 | Use discretion for intense or prolonged exercise; Provide at least three separate rest breaks each hour with a minimum duration of 4 min each. |
| 87.1 - 90.0 | 84.7 - 87.6 | 81.1 - 84.0 | Maximum practice time is 2 h. For Football: players are restricted to helmet, shoulder pads, and shorts during practice. If the WBGT rises to this level during practice, players may continue to work out wearing football pants without changing to shorts. For All Sports: Provide at least four separate rest breaks each hour with a minimum duration of 4 min each. |
| 90.1 - 91.9 | 87.8 - 89.6 | 84.2 - 86.0 | Maximum practice time is 1 h. For Football: No protective equipment may be worn during practice, and there may be no conditioning activities. For All Sports: There must be 20 min of rest breaks distributed throughout the hour of practice. |
| > 92.1 | > 89.8 | > 86.2 | No outdoor workouts. Delay practice until a cooler WBGT is reached. |

*Acclimatization*

1. This acclimatization protocol applies to ALL sports.
2. Days 1 through 5 of the heat acclimatization period consists of the first 5 days of formal practice. During this time, athletes may not participate in more than 1 practice per day.
	1. If a practice is interrupted by inclement weather or heat restrictions, the practice will recommence once conditions are deemed safe. Total practice time will not exceed 3 hours in a single day.
	2. A 1-hour maximum walk-through is permitted during days 1–5 of the heat acclimatization period. However, a 3-hour recovery period will be inserted between the practice and walk-through (or vice versa).
3. During days 1–2 of the heat acclimatization period, in sports requiring helmets or shoulder pads, a helmet will be the only protective equipment permitted (goalies, as in the case of field hockey and related sports, will not wear full protective gear or perform activities that would require protective equipment).
4. During days 3–5, only helmets and shoulder pads will be worn. Beginning on day 6, all protective equipment may be worn and full contact may begin.
	1. Football only: On days 3–5, contact with blocking sleds and tackling dummies may be initiated.
	2. Full-contact sports: 100% live contact drills will begin no earlier than day 6.
5. Beginning no earlier than day 6 and continuing through day 14, double-practice days must be followed by a single-practice day. On single-practice days, 1 walk-through is permitted, separated from the practice by at least 3 hours of continuous rest. When a double-practice day is followed by a rest day, another double-practice day is permitted after the rest day.
6. On a double-practice day, neither practice will exceed 3 hours in duration, and student-athletes will not participate in more than 5 total hours of practice. Warm-up, stretching, cool-down, walk-through, conditioning, and weight room activities are included as part of the practice time.
	1. The 2 practices will be separated by at least 3 continuous hours of rest in a cool environment.
7. Because the risk of exertional heat illnesses during the preseason heat acclimatization period is high, we strongly recommend that an athletic trainer be on site before, during, and after all practices.

*Hydration*

1. Hypohydration represents a continuum from both a clinical perspective (mild = 1% to 5%, moderate= 5% to 10%, and severe= 10% body mass deficit) and an athletic perspective (mild= 1-3%, moderate=3-5% and severe=5% deficit).

Assessing Hydration Status:

1. To ensure that athletes are hydrated prior to exercise a pre- and post-activity, measurement of bodyweight will be recorded whenever possible.
	1. Hydration before exercise will be maintained within + or - 1% of body mass compared to baseline values. A pre-activity hydration status of >3% body mass loss is associated with increased risk for heat illness therefore, if an individual is moderately dehydrated >3% body mass loss the individual will not be allowed to practice.
	2. Post exercise body mass should be <2% and athletes should not gain body mass >2%.
2. In addition to body mass loss, when feasible, first morning urine specific gravity (USG) increases the validity of hydration status assessment. Generally, a USG value >1.020 is considered hypohydrated. Also, personal cues of thirst sensation, urination frequency, and urine color are valuable indicators to consider.
3. Everyone will be aware of the main signs and symptoms of hypohydration;
	1. Thirst
	2. Dark colored urine (similar to apple juice)
	3. Acute body weight loss >2%
4. Hypohydration is a predisposing factor for exertional sickling and those with sickle cell trait or disease will receive targeted education and hydration monitoring.

Fluid Replacement:

1. Water breaks will be provided based on the policy on environmental-condition guidelines using work to rest ratios.
	1. Water or other palatable fluids will be easily accessible before, during and after activity. Cool and flavored beverages are often preferred by athletes and will be made available when possible for optimal rehydration.
2. When possible, diet and rehydration beverages will include sufficient sodium (enough to replace losses) to prevent imbalances that may occur as a result of sweat and urine losses.
3. When needed, individualized hydration plans will be developed and sweat rate (see equation below)
	1. Environment, acclimatization state, body size, exercise duration, exercise intensity, and individual fluid preference and tolerance will be considered when calculating sweat rate.
	2. Sweat Rate Equation:
		* Sweat loss (L) = Body mass before exercise (kg) – Body mass after exercise (kg) + (Volume of fluid consumed during exercise [L]) – (Urine volume, if any [L])
		* Sweat rate (L/h) = Sweat loss (L) / Exercise duration (h)
4. When possible, fluid replacement will be optimized to prevent decreased performance. Core temp is 0.2°C to 0.25°C higher and heart rate is 3-5 bpm higher for every 1% increase in body mass loss.

Treatment in the event of hypohydration (potential medical emergency if severe):

1. If moderate (2%-5%) or severe (greater than 5%) hypohydration is identified, oral fluids will be administered.
2. If severe hypohydration is present with vomiting or diarrhea, EMS will be activated

**Monitoring**

1. Monitoring of student-athletes safety will be continuous during any physical activity.
2. Athletic trainers, coaches, administrators and other athletics personnel will be educated on the signs and symptoms of exertional heat illness (see training/retraining in section 6).
	1. These signs and symptoms include (but are not limited to) the table below

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| Rectal temperature greater than 104 (40°C) at time of incident. | Rapid pulse, low blood pressure, quick breathing |
| Headache | Dehydration, dry mouth, thirst |
| Confusion or just look “out of it” | Decreasing performance or weakness |
| Disorientation or dizziness | Profuse sweating |
| Altered consciousness, coma | Collapse, staggering or sluggish feeling |
| Nausea or vomiting | Muscle cramps, loss of muscle function/balance, inability to walk |
| Diarrhea | Irrational behavior, irritability, emotional instability |

* 1. Coaches and administrators will be educated annually
		1. See training/retraining in section 6

**Treatment in the event of an exertional heat stroke (medical emergency)**

*Recognition*

1. Any athlete with signs of central nervous system dysfunction during exercise in the heat should be suspected to be suffering from EHS until a rectal temperature confirms or refutes this diagnosis.
2. Patients with suspected EHS will have a temperature obtained via rectal thermometer by a QHP.
	1. Rectal thermometers may include a traditional thermometer (e.g. small, discrete), electronic thermometers with a rigid end (e.g. hand-held digital thermometer) or a thermistor (e.g. long, flexible thermistor)
	2. It is important to reiterate that during and following intense exercise in the heat, temporal, aural, oral, skin, axillary and tympanic temperature are not valid and should **never** be utilized in evaluating a potential exertional heat stroke
3. *If a QHP is not available/present, cooling will begin immediately and EMS will be called.*
4. Steps to obtain a rectal temperature:
	1. Remove the athlete from the playing field, to a shaded area.
	2. Drape the patient accordingly (with towels and sheets) for privacy.
		1. Note: It is encouraged that the medical professional ask a coach or other adult to witness the temperature measurement.
	3. Position the patient on their side with their top knee and hip flexed forward.
	4. Make sure the thermometer is cleaned with isopropyl alcohol.
	5. Make sure the probe is plugged into the thermometer (when applicable).
	6. Turn the thermometer on.
	7. Insert the probe 10-15cm past the anal sphincter.
	8. If you meet resistance while inserting, stop and remove the probe and then try again.
	9. Replace the patients clothing.
	10. Temperature duration
		1. For use of a traditional thermometer or a hand-held digital thermometer, insert the probe for initial temperature. If temperature is at or above 104°F, initiate cooling protocol. See directions for continued monitoring in cooling protocol.
		2. For use of a flexible thermistor, leave the probe in for the duration of the treatment.
	11. After the treatment has ended, remove the probe gently.

*Cooling*

1. If rectal temperature is between 102°-104°F, initiate cooling via rotating cold wet towels.
2. If rectal temperature is at or above 104°F, initiate the exertional heat stroke treatment protocol and contact EMS services immediately.
3. The patient must be moved to a cooling zone, begin appropriate treatment and continuously monitor the patient.
	1. For use of a traditional thermometer or a hand-held digital thermometer (any thermometer with a rigid end), obtain initial temperature, remove device, and calculate cooling rate (approximately 1°F every 3-5 minutes when using cold water immersion). When the QHP believes the temperature is within a safe range, remove patient from tub, and re-insert probe to confirm temperature. If temperature is not within the safe range, cooling will continue. Repeat procedure until temperature is confirmed to be within the safe range.
	2. For use of a flexible thermistor, keep the probe in for the duration of treatment.
4. Excess clothing shall be removed to aid cooling.
	1. If removal of clothing and/or equipment would cause delays of 5+ minutes, do not remove and initiate cooling.
5. Place patient in a cold-water (35-59°F) tub up to the neck.
	1. Wrap a towel across the chest and beneath both arms to prevent the athlete from sliding into the tub.
	2. Ice shall cover the surface of the water at all times.
	3. Water shall be continuously and vigorously stirred to maximize cooling.
	4. An ice-cold towel will be placed over the head/neck and rewet and replaced every 2 minutes.
	5. Cooling shall cease when body temperature reaches 102°F.
6. Cold Water Immersion (CWI) Tub
	1. Must be set up:
		1. **[insert school specific decisions for when CWI will be set up]**
		2. **[insert school specific guidelines for where CWI will be set up]**
	2. Proper set-up includes:
		1. A tub filled with water.
		2. Two chests filled with ice next to the tub ready for treatment.
		3. Available bed sheet or large towels.
		4. Towels for placement over the head and neck.
		5. Completion of set-up within 5-10 minutes prior to the practice/competition/event site.
7. Cool First, Transport Second
	1. When a patient is diagnosed with EHS, the principle of Cool First, Transport Second will be used.
		1. Note: EMS should not transport the patient until they reach 102°F due to the inability to continue vigorous cooling in the ambulance

*Vital sign monitoring*

1. The QHP will monitor vital signs including core body (rectal) temperature, heart rate, blood pressure and other vital signs.
2. **[insert school specific guidelines for when vital signs will be done and how often]**

*EMS*

1. EMS must be called immediately if a patient is suspected of EHS.
2. HOWEVER, any patient with EHS must be **cooled FIRST and then transported via EMS.**
	1. This cool first transport second EAP protocol will be communicated/shared with EMS annually PRIOR to the first official sport practice at the school in accordance with the EAP policy and procedures.

**Return to activity**

Patients who have suffered an exertional heat illness must complete a rest period and obtain clearance from a physician before beginning a progression of physical activity under the supervision of a qualified medical professional. The following is the suggested protocol:

* Activity should first begin in a cool environment
* Once patient has shown success with exercise in a cool environment, patient should then complete the heat acclimatization protocol (above) for progression back into exercise in a warm environment.
* Body temperature monitoring may be recommended during the first 1-2 weeks for those returning from EHS episode.

**Training/Retraining:**

The following personnel have been trained to ensure a safe participation environment for all individuals, coaches, employees and staff mentioned in the Scope section of this document, who are engaged in activities that could put them at risk of exertional heat injuries.

This training includes, but is not limited to, the policy and protocols outlined in this document, the prevention of heat illness’, identification of heat related illness’, and when to initiate treatment for those believed to be suffering from an exertional heat illness.

Qualified healthcare professional training(s):

*Will include environmental monitoring review and set up, cold water immersion tub set up, rectal temperature skill development, etc.*

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| Facility: (include the name of each facility if the policy pertains to more than one) |
| Name | Title | Responsibility | Date |
| Example: Joe Smith | Physician | Medical director for high school; responsible for review of protocols, trained in rectal temperature skills | 12/5/00 |
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Athletic administrators, coach, other non QHP professional(s) training(s):

*Will include environmental monitoring review and set up, heat acclimatization protocol, prevention strategies, education on signs and symptoms of patients with exertional heat illness, management of exertional heat illness’. Education will be performed by athletic trainer or other sports medicine healthcare professional, or athletic director.*

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| Facility: (include the name of each facility if the policy pertains to more than one) |
| Name | Title | Responsibility | Date |
| Example: Denise Smith | Head Soccer Coach | Coach responsible for monitoring of soccer field WBGT, soccer coach | 12/5/00 |
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