

Policy #	Title: Environmental Conditions	Distribution: Athletic Department, Athletic Training Services
Effective date: 1/7/2015	Revision date: 8/2015	Planned Review: 1/2017
Approvals:	Last Reviewed: 8/2015	

Lightning Safety

The following emergency action plan is based off the most current recommendations given by the National Weather Service, the National Lightning Safety Institute, the NATA Position Statement on Lightning Safety for Athletics and Recreation as well as the NCAA Sports Medicine handbook. In the situation where **a flash of lightning or a bolt of thunder is observed**:

1. Seek safe shelter at the **first sign** of lightning or thunder. “When Thunder Roars, Go Indoors”
2. Safe shelter is considered any **fully enclosed building** that involves **plumbing and/or electrical wires** that act to electrically ground the structure. “No Place outside is safe when thunderstorms are in the area.”
3. If such a shelter cannot be found, take shelter in any **vehicle with a hard metal roof and closed windows**.
4. While indoors, **stay away** from any the walls, windows, plumbing and electronic devices attached to the walls (including landline telephones). If in a vehicle, avoid contact with the metal frame and radio use.
5. **Designate** a weather watcher to monitor the weather from a safe location.
 - a. **During events where Athletic Training Services are providing on-site coverage, Athletic Training Services will make the decision regarding suspension and resumption of outdoor activities as outlined in this policy. These decisions will be communicated to Athletics Administration, Facilities Management, Coaches, Officials, etc. as appropriate. Further, Athletic Training Services will designate a weather watcher.**
 - b. **Decisions regarding suspension and resumption of outdoor activities in circumstances where Athletic Training Services are not present will be made in accordance with this policy by Athletics Administration, Facilities Management, Coaches and/or their appropriate designees. The individual responsible for this decision will designate a weather watcher.**
6. No outdoor activities are to be resumed until 30 minutes after the last sign of lightning/thunder. For every sign observed, the 30 minute timer is reset.

Management of Storm-Induced Injuries

Individuals that are struck by lightning do not carry residual charge and may be handled without danger to the medical personnel. The medical personnel should:

1. Evaluate whether the scene is safe. On-going lightning may still be a threat.
2. Safely move the injured individual to a safe shelter.
3. Activate emergency medical response systems if deemed necessary. The use of a cell phone is recommended during electrical storms.
4. Apply any first aid necessary.

To activate EMS by calling BU Police Dept from a cell phone: **(617) 353-2121**
 BU landline campus phone/Blue Box: **3-2121**

Recommended lightning-safe, emergency phone, and AED locations

Venue	Safe Location	Emergency Phone Location	AED Location
Softball Field	Track and Tennis Center (TTC)	TTC main entrance	1) TTC: ambulance entrance on SW corner
Nickerson Field	Lobby of Case	Ground Floor of Case Center Lobby near First Aid/EMT Room	Case ATR
FitRec Aquatic Center	Lower Lobby of FitRec	Next to starting blocks	Pool deck by

	Center (Locker room NOT safe)		lifeguard office
DeWolfe Boathouse	Inside boathouse	Coaches' offices on main level	Dock level inside boathouse
Faneuil Pool (Case Athletic Center)	Lobby of Case	Ground Floor near First Aid/EMT Room	Case ATR
Franklin Park	Ranger Station or team vehicle	N/A	N/A
Outside Tennis Courts	Lobby of Case	Ground Floor of Case Center Lobby Near First Aid/EMT Room	Case ATR

Recommended Lightning Safety Strategies

The following should be considered when developing a strategy:

1. Multiple means of monitoring weather are encouraged for large athletic events. A longer time to clear the venue should be anticipated due to congestion.
2. Avoid being near the highest point of a particular venue.
3. Individuals who feel their hair stand on end should assume the lightning safety position – crouched on ground, weight on balls of their feet, head lowered, and ears covered. **Avoid lying flat on the ground.**

The following mechanisms of injury may provide more insight on situations/areas to avoid when seeking a safe location during a thunderstorm.

Mechanisms of Lightning Injury

- **Direct strike**
Occurs to the head, current may enter the orifices causing eye and ear injuries. When assuming the lightning-safe position, one can cover their ears to help avoid this type of trauma.
- **Contact injury**
Occurs when the victim is touching an object that is in the pathway of a lightning current.
- **Side flash**
Lightning may strike an object near the victim and then jumps from that object to the victim. The chance of a side flash is increased under a shelter such as a small picnic shelter or next to a tree.
- **Step voltage or ground current**
Current from lightning radiates outward from strike point. When assuming lightning safety position, place feet close together to avoid injury.
- **Blunt injury**
Lightning current can create abrupt heating/cooling of air leading to explosive/implosive forces that cause injury.

References

National Lightning Safety Institute Web site: www.lightningsafety.com
 NOAA Lightning Safety Web site: www.lightningsafety.noaa.gov/
 2014-2015 NCAA Sports Medicine Handbook
 NATA Position Statement: Lightning Safety in Athletics and Recreation

Cold Weather Policy

The following policy guides decision making for patient safety regarding environmental cold injuries. Exposure to cold presents an inherent risk of injury. It is important to note that the following guidelines for activity and associated limitations apply only in the **absence of precipitation**. Precipitation, most notably rain and snow, will affect the risk of environmental cold injury. It is unclear in the literature at exactly what rate of rain or snow fall, in conjunction with the air temperature and wind rate, conditions become unsafe. However, it is clear that precipitation significantly increases the risk of environmental cold injury. Therefore, in circumstances involving precipitation, decisions about participation restrictions will be made by Athletic Training Services on an individual basis based upon the current conditions.

All outdoor athletic events at Boston University operate under the guidelines in the following table. The certified athletic trainer is responsible for communicating to all athletic personnel and employing these guidelines. Please note the following temperatures ranges account for wind-chill.

<i>Wind-Chill Temperature</i>	<i>Guidelines/adjustment</i>
< 25°F	<ul style="list-style-type: none"> - Be aware and ready for possibility of cold injuries. - All practice participants will take reasonable precautions to cover exposed skin. This includes, at minimum: practice participants should wear long sleeves, pants, gloves, and hats during warm up activities. Hats and gloves should remain on during practice. All non-participating student-athletes should have exposed skin covered.
≤ 20°F	<ul style="list-style-type: none"> - All practice participants must wear appropriate clothing/equipment at all times while outdoors. This includes, at minimum: long sleeves, pants, gloves, and hats. Athletic Training Services will make additional clothing or equipment recommendations as seen fit. Any practice participant not in appropriate clothing/equipment must be removed from practice and remain indoors until appropriate clothing/equipment is worn. - All non-participating student-athletes should remain indoors.
≤ 15°F	<ul style="list-style-type: none"> - Must comply with previously stated clothing/equipment requirements. - Warm up and cool down activities should occur indoors. - Practice plan should be altered to decrease “down time” where participants are not moving. - Appropriate practice length should be determined, in advance, by head coach and Athletic Training Services based upon the intensity of the practice plan. - All non-participating student-athletes should remain indoors.
≤ 10°F	<ul style="list-style-type: none"> - Must comply with previously stated clothing/equipment requirements. - Warm up and cool down activities must occur indoors. - Practice plan should be altered to decrease “down time” where participants are not moving. - Maximum exposure time: 60 minutes (<i>any further exposure that day must follow a period time that includes complete re-warming and the changing of all base layer clothing</i>) - All non-participating student-athletes should remain indoors.
≤ 0°F	<ul style="list-style-type: none"> - Cancel event and reschedule

All temperature readings for interpretation of the above chart will be taken by Athletic Training Services immediately preceding the scheduled practice or game, using the Kestrel® 4500 Pocket Weather Tracker. Communication regarding readings taken prior to this will occur between the head coach and Athletic Training Services on an individual basis. **NOTE:** *the above guidelines may be altered by Athletic Training Services in the presence of other mitigating factors, such as, portable heaters, temporary re-warming facilities, altering game play rules (e.g. extended half-times for rewarming), etc. These decisions will be made on an individual basis.*

For events involving participants subject to this policy that are not directly covered by Athletic Training Services and occur off campus, decision will be made based upon the most currently available data from the National Weather Service. This information can be located at:

http://www.weather.com/weather/today/Boston+MA+USMA0046?lswe=boston%20ma&from=searchbox_localwx

Rowing Policy

Rowing in cold weather is deemed **dangerous**. Cold weather is defined as **combined air (includes wind-chill) and water temperature of 90°F and below, or when water temperature drops below 50°F**. Water temperature will be determined by the thermometer on the wind meter housed at the DeWolfe Boathouse, air temperature will be determined at the link provided below. When these conditions occur Boston University strictly advocates that all of the following criteria be met for each individual boat:

- Use of 4-oars
- Use of a personnel floatation device or neoprene suit for each member on the boat
- A method of activating 911

Air temperature information (note the temperature corresponding to ‘Feels like’):

http://www.weather.com/weather/today/Boston+MA+USMA0046?lswe=boston%20ma&from=searchbox_localwx

Recognition

Recognizing early signs of cold-induced stress may prove to be important in preventing cold weather-related injuries. The following signs and symptoms are considered to be early warning signs:

- shivering
- abnormal sensation at the distal extremities (e.g. numbness, pain, or burning sensation)
- disorientation
- slurred speech

Signs & Symptoms of Common Cold Injuries

<p><i>Hypothermia</i></p> <ul style="list-style-type: none"> • Shivering • Cold sensation, goose bumps, confusion, numbness • Intense shivering, lack of coordination, sluggishness • Violent shivering, difficulty speaking, mental confusion, stumbling, depression • Muscle stiffness, slurred speech and trouble seeing • Unconsciousness 	<p><i>Frostbite</i></p> <ul style="list-style-type: none"> • Pain • Burning • Numbness • Tingling • Skin turns hard and white • Skin starts to peel or get blisters • Skin starts to itch • Skin gets firm, shiny, and grayish-yellow
<p><i>Chilblain/pernio</i></p> <ul style="list-style-type: none"> • Red or cyanotic lesions • Swelling • Itching, numbness, burning or tingling • Skin necrosis 	<p><i>Immersion (trench) foot</i></p> <ul style="list-style-type: none"> • Burning, tingling, itching • Loss of sensation • Cyanotic/blotchy skin • Swelling • Blisters • Skin fissures

This policy is intended to guide patient care. Medical conditions and specific medical situations are often complex and require health care providers to make independent judgments. These policies may be modified by practitioners to achieve maximal patient outcomes.

Situations where an athlete is exposed to cold-weather and would **like to lay down and rest** are considered by the 2009-2010 NCAA Sports Medicine handbook to be **medical emergencies**. The emergency action plan should immediately be activated.

Treatment

If a certified athletic trainer is NOT PRESENT:

1. Immediately call and refer the athlete to the Boston University Sports Medicine Department at 285 Babcock Street **(617-353-2746)**.
2. Should no member of the Boston University Sports Medicine Department be available at the time, the athlete should be sent to the Boston Medical Center Emergency Room or comparable emergency room for immediate care.

Activate EMS by calling BU Police Dept from a cell phone: **(617) 353-2121**
 BU campus phone/Blue Box: **3-2121**

If a certified athletic trainer is PRESENT:

1. Determine if the emergency action plan needs to be activated. If so, designate another individual to activate emergency medical services.
2. Treat the individual according to current medical practices. *See table below.*
3. When emergency medical services arrive, accompany or designate a responsible liaison to accompany the individual to the hospital..
4. Notify the Director of Athletic Training Services and Head Athletic Trainer.

<p>Hypothermia</p> <ul style="list-style-type: none"> • Move individual to warm area, with great caution if cardiac arrhythmia observed • Remove all wet clothing and replace with dry • Assess airway, breathing, and circulation: treat if abnormal • Monitor temperature using <i>rectal thermometer</i> <ul style="list-style-type: none"> • <i>Mild:</i> 98.7 – 95.0°F • <i>Mod/Sev:</i> 94.9 – 90.0°F • Avoid friction massages to area • Rewarm by applying gentle heat to axillae, chest, and groin 	<p>Frostbite</p> <ul style="list-style-type: none"> • Rule out hypothermia • Tissue plasminogen activators (tPA) may be used to prevent amputation in severe cases • Immerse area in warm water (98.0 – 104°F) • Protect area • If tissue sloughing involved, infection control warranted.
<p>Chilblain/pernio</p> <ul style="list-style-type: none"> • When rewarming, inflammation, redness and itching may be observed • Do not disturb any skin lesions 	<p>Immersion (trench) foot</p> <ul style="list-style-type: none"> • Clean and dry area • Apply warming agent • Replace with dry socks & footwear

Any athlete that seeks medical help outside of Boston University for cold related illness MUST follow up with a Boston University’s team physician for clearance PRIOR to returning to activity.

Rowing

In a situation where an individual falls into the cold water (< 60°F):

1. Quickly remove the individual from the water.
2. Call your certified athletic trainer immediately. If there is no response, activate emergency medical services. Give them the address of the nearest location that provides heating.
3. Carefully move the individual to a safe and warm location.

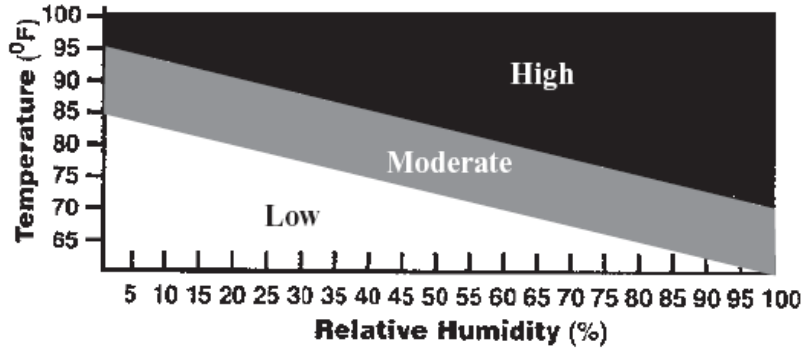
This policy is intended to guide patient care. Medical conditions and specific medical situations are often complex and require health care providers to make independent judgments. These policies may be modified by practitioners to achieve maximal patient outcomes.

References:

1. 2013-2014 NCAA Sports Medicine Handbook
2. American College of Sports Medicine Web site: www.acsm.org
3. Bergeron MF, Bahr, R, Bartsch P, et al. International olympic committee consensus statement on thermoregulatory and altitude challenges for high-level athletes. *Br J Sports Med.* 2012;46:770-779.
4. Cappaert, T. A., Stone, J. A., Castellani, J. W., Krause, B. A., Smith, D., & Stephens, B. A. (2008). National Athletic Trainers' Association position statement: Environmental Cold Injuries. *Journal of Athletic Training*, 43(6), 640-658.
5. Castellani JW, Young JA. Health and performance challenges during sports training and competition in cold weather. *Br J Sports Med.* 2012;46:788-791.
6. USRowing Web site: www.usrowing.org

Hot Weather Policy

All outdoor athletic events at Boston University operate under guidelines highlighted in the following table. The certified athletic trainer is responsible for communicating to all athletic personnel and employing these guidelines. Please utilize the following table (from 2009-2010 NCAA Sports Medicine Handbook) to determine the guidelines recommended for your practice conditions.



Temperature zone	Guidelines/adjustment
Low Risk Zone (WBGT < 65°F)	- Perform activity as planned - Include 5-10 minute fluid breaks every 20-30 minutes of practice
Moderate Risk Zone (65°F < WBGT < 75°F)	- Include 5-10 minutes fluid breaks every 15-20 minutes of practice - If applicable, upper body pads only
High Risk Zone (WBGT > 75°F)	- Consider delaying/canceling/rescheduling activity - If applicable, no protective equipment may be worn

Recognition: Signs & Symptoms of Common Heat Injuries

<p>Exercise-associated muscle (heat) cramps</p> <ul style="list-style-type: none"> • Dehydration • Thirst • Sweating • Transient muscle cramps • Fatigue 	<p>Heat Syncope</p> <ul style="list-style-type: none"> • Dehydration • Fatigue • Tunnel vision • Pale/sweaty skin • Decreased pulse rate • Dizziness • Lightheadedness • Fainting
<p>Exercise (heat) exhaustion</p> <ul style="list-style-type: none"> • Core temp (97.0 – 104.0°F) • Dehydration • Dizziness • Lightheadedness • Syncope • Headache • Nausea • Intestinal cramps/diarrhea • Pallor • Profuse sweating • Cool, clammy skin • Weakness 	<p>Exertional heat stroke</p> <ul style="list-style-type: none"> • Core temp (> 104.0°F) • Dizziness • Drowsiness • Irrational behavior • Confusion/disorientation/irritability • Loss of consciousness • Dehydration • Weakness • Hot and wet/dry skin • Tachycardia (100-120 bpm) • Hypotension • Hyperventilation

<ul style="list-style-type: none"> • Hyperventilation 	<ul style="list-style-type: none"> • Vomiting • Diarrhea
Exertional hyponatremia <ul style="list-style-type: none"> • Core temp (< 104.0°F) • Nausea • Vomiting • Swelling of extremities • Low sodium level • Progressive headache • Confusion • Lethargy • Seizures/coma 	

Treatment

Boston University utilizes the following as a general procedural guideline in the occurrence of heat-related injuries.

If a certified athletic trainer is NOT PRESENT:

1. Immediately call and refer the athlete to the Boston University Sports Medicine Department at 285 Babcock Street.
2. Should no member of the Boston University Sports Medicine Department be available at the time, the athlete should be sent to the Boston Medical Center Emergency Room or comparable emergency room for immediate care.

Activate EMS by calling BU Police Dept from a cell phone: **(617) 353-2121**
 BU campus phone/Blue Box: **3-2121**

If a certified athletic trainer is PRESENT:

1. Determine if the emergency action plan needs to be activated. If so, designate another individual to activate emergency medical services.
2. Treat the individual according to current medical practices. *See table below.*
3. When emergency medical services arrive, accompany or designate a responsible liaison to accompany the individual to the hospital.
4. Notify the Director of Athletic Training Services and Head Athletic Trainer.

Assessing Core Temperature

Assess the individual to determine nature and degree of illness. Use of a **rectal thermometer** has been suggested by research to be the most accurate method of accessing core temperature and allows for differentiation between many of the similar sign & symptoms between heat-related injuries. 2002 NATA Position Statement recommends that certified athletic trainers should not rely on the readings from oral, tympanic, or axillary temperatures.

Exercise-associated muscle (heat) cramps <ul style="list-style-type: none"> • Stop activity • Replace lost fluids w/ high sodium drink • Mild stretching & massage • IVs must be ordered by physician 	Heat syncope <ul style="list-style-type: none"> • Move athlete to shaded area • Monitor vital signs • Elevate legs above head • Rehydrate
Exercise (heat) exhaustion <ul style="list-style-type: none"> • Measure core temp w/ rectal thermometer • Remove excess clothing • Cool athlete w/ fans, ice towels, or ice bags if temp > 102°F 	Exertional heat stroke <ul style="list-style-type: none"> • Active EMS • Measure core temp w/ rectal thermometer • Assess cognitive function • Lower core temp as quickly as

This policy is intended to guide patient care. Medical conditions and specific medical situations are often complex and require health care providers to make independent judgments. These policies may be modified by practitioners to achieve maximal patient outcomes.

<ul style="list-style-type: none"> • Transfer care to physician if recovery is not rapid or effective 	<p>possible (cold water tub 35 – 59°F)</p> <ul style="list-style-type: none"> • Monitor temperature • Remove from tub once core temp reaches 101-102°F • EMS transport
<p>Exertional hyponatremia</p> <ul style="list-style-type: none"> • Differentiate from heat exhaustion (should c/o headache, mental compromise, lethargy, swelling of extremities) • Differentiate from heat stroke w/ core temp (should be < 104°F) • Immediate transfer for IVs 	

Cold-Water Submersion

Cold-water submersion (35 - 59°F) has been suggested by research to be the most effective way of cooling the body if an athlete is suspected to be suffering from heat stroke. The 2002 NATA Position Statement on heat-related injuries reported that cold-water submersion had a zero percent fatality rate in 252 cases in the military. Use of a **rectal thermometer** has also been suggested by research to be the most effective means of monitoring core temperature. The athlete should be removed from the water when core temperature reaches 101-102°F and transported via EMS.

Return to Play after Exertional Heat Stroke

There are currently no evidence-based guidelines concerning the proper return to play progression after suffering from exertional heat stroke. The following are the most recent guidelines recommended by the American College of Sports Medicine (2007):

1. Refrain from exercise for at least 7 days following release from medical care.
2. Follow up in about 1 week for physical exam and repeat lab testing or diagnostic imaging of affected organs that may be indicated, based on the physician’s evaluation.
3. When cleared for activity, begin exercise in a cool environment and gradually increase the duration, intensity, and heat exposure for 2 weeks to acclimatize and demonstrate heat tolerance.
4. If return to activity is difficult, consider a laboratory exercise-heat tolerance test about one month post-incident.
5. Clear the athlete for full competition if heat tolerance exists after 2-4 weeks of training.

(Armstrong et al., 2007)

References:

1. 2009-2010 NCAA Sports Medicine Handbook
2. Armstrong, L. E., Casa, D. J., Millard-Stafford, M., Moran, D. S., Pyne, S. W., & Roberts, W. O. (2007). American College of Sports Medicine position stand: Exertional heat illness during training and competition. *Medicine & Science in Sports & Exercise*, 37(3), 556-572.
3. Binkley, H. M., Beckett, J., Casa, D. J., Kleiner, D. M., & Plummer, P. E. (2002). National Athletic Trainers’ Association position statement: Exertional heat illnesses. *Journal of Athletic Training*, 37(3), 329-343.
4. Casa, D. J. & Csillan, D. (2009) Pre-season heat-acclimitization guidelines for secondary school athletics. *Journal of Athletic Training*, 44(3), 332-333.

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