

LIGHTNING SAFETY PROGRAM

I. Purpose

The purpose of this program is to establish policy, procedures and responsibilities for providing information to Brown University faculty, staff, and students with regard to safety procedures during thunderstorms or lightning conditions.

II. Scope

The scope of this program is to ensure that the appropriate faculty, staff and students are informed and trained on the proper procedures to follow when the potential threat of lightning becomes imminent. This program includes, but is not limited to, protocol for establishing a chain of command, defining safe and unsafe locations to use during incidence of lightning, what to do if such locations can't be reached, and policy regarding the resumption of activities.

III. Application

The Lightning Safety Program applies to all faculty, staff and students and all others present at outdoor events that may be affected by severe weather that includes lightning.

Individuals and Events Covered

The Lightning Safety Program will be most commonly applicable to all outdoor sporting events. In these cases, this program covers and assigns responsibilities to coaches, players, certified athletic trainers, referees or umpires, assistants, spectators, administrators and various on-site league coordinators. Specific responsibilities of these individuals are outlined within the program.

Similar responsibilities are applicable to Brown University faculty, staff, students, and others present at various other outdoor University events. Such events could include but are not limited to outdoor receptions, special events, celebrations, or demonstrations. These events might be student-run or not, but the responsibilities of Event Managers remains the same. Specific responsibilities of these individuals are outlined within the program.

Because of the grave safety concern, no outdoor events hosted by or on Brown University property are exempt from this policy, and it is highly recommended that protocol be maintained throughout the entire incidence of lightning (the duration of which will be specified later in the program). Members of the Brown University community attending events not hosted by Brown University are encouraged, to follow the event hosts' lighting safety program or this program in the absence of such a program.

External Groups/Organizations

External groups or organizations hosting events on Brown University property are required to follow the policy and procedures of this program. The University department allowing permission for the external group or organization to use a University facility is responsible for providing this program to that external group or organization.

IV. Definitions

Chain of Command – protocol that identifies and assigns responsibility to the individual(s) in charge of removing all event attendees from the affected area and relocating them to a safe location. The Event Manager is the individual with responsibility for the event.

Flash-to-Bang Method – method of estimating how far away lightning is using the time differential between the incidence of thunder and the incidence of lightning.

Lightning - the occurrence of a natural electrical discharge of very short duration and high voltage between a cloud and the ground or within a cloud, accompanied by a bright flash and typically also thunder. Lightning is a health and injury risk for anyone within a close radius to its incidence, and should be dealt with in an appropriate fashion.

Lightning-Safe Position – the best body position to assume should you be unable to find a safe location during a thunderstorm.

Resumption of Activities – refers to the time at which the Event Manager can and will choose to resume activities.

Event Manager – designated person(s) in charge of monitoring weather conditions, recognizing the threat of lightning, declaring a lightning emergency, and coordinating the relocation of event attendees within the affected area. During intercollegiate sporting events, this individual will be designated by the Department of Athletics (typically certified athletic trainers, coaches or Department of Athletics administrators). During other outdoor events, this individual will be the designated on-site event sponsor from the group sponsoring the event. This individual is responsible to make safety decisions.

Safe Location – designated area in which it is likely to be safe to reside during incidence of lightning. These locations are most often fully enclosed, frequently inhabited buildings.

Severe Thunderstorm – In the U.S., the National Weather Service defines a severe thunderstorm as having large hail being at least ¾ inch (19 mm) in diameter, high winds as being 58 miles per hour (93 km/h) or greater, producing tornadoes, or any combination of the three.

Severe Thunderstorm Watch – means that conditions are favorable for the development of severe thunderstorms in and close to the watch area.

Severe Thunderstorm Warning – means there is significant danger of severe thunderstorms for the warned area.

Unsafe Location – designated area in which it is likely to be unsafe to reside during incidence of lightning. These areas are usually outdoors and are usually the highest point of an open field, on the open water or in an unused shelter.

Weather watcher – a person designated by the Event Manager to monitor weather conditions and report any development of a severe thunderstorm back to the Event Manager. This person could be the Event Manager.

V. Procedures

Establishing Chain of Command

Event organization is critical in situations when attendees' safety is in jeopardy. It is therefore essential that a chain of command, or organizational structure, be established that clearly identifies the Event Manager. A chain of command requires that the Event Manager remain in control of the event at all times and provide clear direction to others assisting with the event. During an incidence

of lightning or other safety concerns the senior ranking Public Safety Officer may assume the responsibility of Event Manager to ensure the safety of all attendees'. During intercollegiate sporting events, the Event Manager will be designated by the Department of Athletics (typically certified athletic trainers, coaches or Department of Athletics administrators).

The Event Manager should actively look for signs of developing local thunderstorms, such as high winds, darkening clouds, or any lightning or thunder and notify the chain of command if severe weather becomes dangerous. Consider having a reliable on-site means of monitoring local weather forecasts or storm warnings so that Event Managers have ample time to prepare for and execute relocation.

Determining Safe and Unsafe Locations

Safe Locations

It is important for Event Managers to know the closest safe location in proximity to the field, playing area, or event area, and how long it will take to relocate the group (team or other) there. The primary choice for a safe location is any fully enclosed and frequently inhabited building. In any situation, it is always better to be inside a building rather than outdoors during thunderstorms. In most buildings, electric and telephone wiring and plumbing pathways aid in grounding a building, which makes it less susceptible to lightning strikes; it is important, however, to keep physically away from these systems while inside during the thunderstorm.

If an enclosed building is unavailable at the time of the lightning storm, a secondary choice for a safe location is a fully enclosed vehicle with a metal roof and closed windows. Any team van or bus, or any private vehicle is recommended; however, convertible cars and golf carts do not provide protection from lightning danger. It is also critical that individuals not touch any part of the metal framework inside of the vehicle during ongoing thunderstorms.

Lightning is unpredictable and could strike anywhere at any time. The University has designated the following buildings as best options for sheltering during a lightning event based on the guidelines provided by the National Oceanic and Atmospheric Administration (NOAA) and the National Athletic Trainers' Association (NATA). The following list is not a complete list of safe buildings, but buildings that are located around outdoor space where major events occur.

- Main Green Locations
 - Steven Roberts Campus Center (aka Faunce House)
 - Salomon Hall
 - Sayles Hall
 - Wilson Hall
- Wendell R. Erickson Athletic Complex
 - Olney-Margolies Athletic Center (OMAC)
 - Meehan Auditorium
 - Nelson Fitness Center
 - Pizzitola Memorial Sports Center
- Off Campus Locations
 - Haffenreffer Outing Facility
 - Marston Boathouse

While planning the event, the time it takes to move the attendees to a safe location must be taken into account. The Event Manager is responsible for ensuring that a reasonable amount of time is provided to get everyone to safety.

Unsafe Locations

Smaller structures, athletic storage sheds, baseball or softball dugouts, or press boxes have either too little protection or have high electric conductivity to be utilized safely. In fact, these locations may even increase the risk of lightning strike. In addition, the University has deemed that the open area beneath the Brown Stadium is an unsafe location and should not be used as shelter during a lightning event. Never use tents or trees as shelters or stay adjacent to flag or light poles.

Mainly, avoid being in proximity to the highest point of an open field or on the open water. For this reason, crew teams should take extra precaution on days with inclement weather. Avoid taking showers or being in the shower area, using indoor plumbing, or using indoor electricity (especially landline telephones) during thunderstorms. Cordless or cellular phones are much safer in these instances.

When to Seek a Safe Location

The presence of a blue sky and the absence of rain do not ensure one is protected from a lightning strike. Lightning can and does strike as far as 10 miles away from the rain shaft. It does not have to be raining or have clouds directly above for lightning to strike.

Brown University utilizes the a weather service by Schneider Electric’s MXVision WeatherSentry® Online to help provide advanced warning for severe weather and for storm tracking. Departments on campus frequently involved with managing outdoor events including Athletics, Facilities Management, Public Safety, University Events, and the School of Professional Studies have access to the system’s capabilities including notifications for approaching severe weather conditions. Environmental Health & Safety administers this service. Staff who are registered to get text and email weather alerts should be aware that lighting alerts are set to provide a Caution Alert at 30 miles and a Warning Alert at 8 miles. Once a Warning is received indicating that lightning is within 8 miles, events should be halted and people should be advised to move to a safe indoor location to Shelter in Place. An All Clear message will be sent by the system when no lightning has occurred within 8 miles for a period of 30 minutes, at which time outdoor events may resume.

Table 1 - Summary of Actions for Event Managers

Alert Range	Action
30 Miles	Caution Alert – Watch weather closely and be prepared to seek shelter.
8 Miles	Warning Alert – Halt the event and seek shelter indoors immediately.
All Clear	Resume outdoor activities when no lightning has occurred within 10 miles for a period of 30 minutes.

Event Managers should always be aware of how close lightning is occurring. The flash-to-bang method is a fairly easy and reliable way to estimate how far away lightning is in the absence of the WeatherSentry® system. In these types of storms, lightning is always accompanied by thunder. To use the flash-to-bang method, the Event Manager should count the time in seconds from when the lightning is seen to when its accompanying clap of thunder is heard. Dividing this number by five gives you the number of miles away from your location the lightning is. For example, if you count 15 seconds between the flash and the bang, the lightning is approximately 3 miles away. As a minimum requirement, it is Brown’s policy that all individuals should already be inside or should immediately seek a safe structure or location if the flash-to-bang count approaches 30 seconds or less whether it is raining already or not.

Event Managers may also rely on the National Weather Services’ issuance of a severe thunderstorm watch as an indicator of when it is appropriate to seek a safe location to shelter. The following

internet sources of current weather information will provide updates on current local weather information.

- National Weather Service Website – www.weather.gov
- Intellicast Website – www.intellicast.com
- Accuweather Website – www.accuweather.com
- The Weather Channel Website – www.weather.com

It is recommended that Event Managers prepare site specific announcements that can be used in the event of lighting. This site specific announcement should include the location of the nearest safe location.

All individuals have the right to leave an athletic site or activity, without fear of repercussion or penalty from anyone, in order to seek a safe structure or location if they feel they are in danger from impending lightning activity.

In the Absence of a Safe Location

Most outdoor areas of campus are fairly close to safe location. There are a few areas for the Department of Athletics that may require a few minutes to walk to a safe location. In the event of lightning it may be safer to quickly move to a safe location rather than getting into a lightning-safe position.

Minimizing one's vertical height during a thunderstorm is essential. Stay away from the tallest trees, light poles, flag poles, fences, metal bleachers, standing pools of water, or open fields in the area. Never take shelter under a single, tall tree as they are massive conductors of electricity. Participants in crew, sailing, or other outdoor water activity should always seek the nearest dry land immediately at the first sign of inclement weather that could result in lightning. Once landed, everyone should attempt to find a safe location nearby.

If no safe location is available, everyone should stay alert for warning signs of imminent lightning. Such warnings include hair standing on end, tingling of the skin or hearing crackling noises. If these conditions occur, a cloud-to-ground lightning flash could strike in the immediate area. In these conditions using the lightning-safe position may be appropriate. The lightning-safe position is defined as crouched on the ground, feet together, weight on the balls of the feet, head lowered, and ears covered. Do not lie flat on the ground. The lightning-safe position is intended to minimize the probability of a direct strike by both lowering the person's height and minimizing the area in contact with the surface of the ground. The lightning-safe position does not guarantee a person will not be struck by lightning and people should consider it as a last option. In the lightning-safe position the risk of being struck by lightning is only slightly reduced.

Resumption of Outdoor Activities

When considering the resumption of any outdoor University event, Event Managers are highly recommended to wait at least 30 minutes after the last flash of lightning or clap of thunder before returning outdoors to the event location. Each time lightning or thunder is observed, a 30 minute countdown should be reset.

Managing Victims of Lightning Strike

If an individual has fallen victim to a lightning strike, observe the following basic first-aid procedures:

1. Survey the scene for safety issues. Ongoing thunderstorms may still pose a threat to emergency personnel responding to the situation. In these cases, the certified athletic trainer, coach, or EMT should consider his or her own personal safety before venturing into a dangerous situation to render care.
2. Contact Brown University Public Safety at (401) 863-4111 immediately for medical assistance. A cellular or cordless phone is suitable and safe for use.
3. If you assume the risk of entering a dangerous situation involving lightning to render help, the first priority should be to move the victim with care to a safer location.
4. Evaluate victim's airway, respiration, and circulation, and if you are certified in CPR and AED, begin CPR if necessary. Victims of lightning strikes do not carry an electrical charge; CPR is therefore safe for the certified responder. The application of an automated external defibrillator (AED) is recommended for use on a lightning strike victim.
5. Evaluate and treat for hypothermia, shock, fractures and/or burns.

VI. Responsibilities

Event Manager

It is the Event Manager's responsibility to provide support for successful implementation of the Lightning Safety Program at the operational level. It is also their responsibility to ensure that safety practices are in place and implemented when necessary. The Event Manager is responsible for:

- Being aware of weather forecasts and track forecasts of inclement weather that may result in lightning.
 - The Event Manger should use various methods, including the flash-to-bang method, to monitor storm systems.
 - Event Managers shall contact EHS if they need access to the weather notification system.
- Organizing and relocating of all event attendees to a safe location as soon as possible.
- For responding quickly to inclement weather and exercising the utmost caution in making decisions.
- Coordinate with Public Safety (401-863-3322) every time sheltering in a building is necessary due to lightning. At a minimum, the on-duty Public Safety Supervisor will need to understand how many people will need sheltering, where the shelter is and what event requires sheltering.

Coaches and Other Athletic Authorities

All coaches and other authorities at athletic events are fully expected to answer to the Event Manager and follow his or her lead with regard to any inclement weather conditions that may affect athletes, team members, referees, spectators or others. Coaches must not impede the direction of the Event Manager and be in full compliance with University Lightning Safety Policy.

Department of Public Safety

The Department of Public Safety is responsible for providing assistance in allowing access to buildings during storm conditions in which the Lightning Safety Policy applies.

Emergency Medical Services

EMS will provide medical assistance to lightning strike victims, provided they do not put themselves in jeopardy to do so.

Environmental Health and Safety

Environmental Health and Safety will develop, maintain, review, and update the Lightning Safety Program as necessary.

VII. Training Requirements

This program requires no formal training. However, it is strongly recommended that all Event Managers be familiar with the policy and procedures of this program. Departments that sponsor events may have specific requirements and may require specific departmental training for Event Managers. Environmental Health & Safety can provide training on the requirements of this program upon request.

VIII. References

AccuWeather: *WeatherData Recommendation Memo* (2008)

Brown University: *Emergency Action Plan*

Brown University: *Fire Safety for Events Program* (2008)

National Athletic Trainers' Association: *Position Statement on Lightning Safety for Athletics and Recreation* (2013)

National Collegiate Athletic Association 2014-15 Sports Medicine Handbook

National Oceanic and Atmospheric Administration: *Severe Weather 101 - Lightning*

University of Florida: *University Athletic Association Weather/Lightning Policy* (2008)