

# GUIDELINE 1E

## LIGHTNING SAFETY

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Lightning is the most consistent and significant weather hazard that may affect intercollegiate athletics. Within the United States, the National Oceanic and Atmospheric Administration (NOAA) estimates that 40 fatalities and about 10 times as many injuries occur from lightning strikes every year. NOAA attributes 48 percent of the fatalities to lightning strikes during organized sport activities at all levels across the country. While the probability of being struck by lightning is low, the odds are significantly greater when a storm is in the area and proper safety precautions are not followed.

Education and prevention are the keys to lightning safety. The references associated with this guideline are an excellent educational resource. Prevention should begin long before any intercollegiate athletics event or practice by being proactive and having a lightning safety plan in place. The following steps are recommended by the NCAA and NOAA to mitigate the lightning hazard:

1. Develop a lightning safety plan for each outdoor venue.
2. Designate a person to monitor threatening weather and to notify the chain of command who can make the decision to remove a team, game personnel, television crews and spectators from an athletics site or event. A lightning safety plan should include planned instructions/announcements for participants and spectators, designation of warning and all-clear signals, proper signage and designation of safer places from the lightning hazard.
3. Monitor local weather reports each day before any practice or event. Be diligently aware of potential thunderstorms that may form during scheduled intercollegiate athletics events or practices. Weather information can be found through various means via local television news coverage, the Internet, cable and satellite weather programming, a lightning detection and notification service, or the National Weather Service (NWS) website at [www.weather.gov](http://www.weather.gov).
4. Be informed of National Weather Service (NWS) issued thunderstorm “watches” or “warnings,” and the warning signs of developing thunderstorms in the area, such as high winds or darkening skies. A “watch” means conditions are favorable for severe weather to develop in an area; a “warning” means that severe weather has been reported in an area and for everyone to take the proper precautions. It should be noted that neither watches nor warnings are issued for lightning. A NOAA weather radio is particularly helpful in providing this information.

### DANGEROUS LOCATIONS

Outside locations increase the risk of being struck by lightning when thunderstorms are in the area. Small covered shelters are not safe from lightning. Dugouts, refreshment stands, open press boxes, rain shelters, golf shelters and picnic shelters, even if they are properly grounded for structural safety, are usually not properly grounded from the effects of lightning and side flashes to people. They are usually very unsafe and may actually increase the risk of lightning injury. Other dangerous locations include bodies of water (pools, ponds, lakes) and areas connected to, or near, light poles, towers and fences that can carry a nearby strike to people. Also dangerous is any location that makes the person the highest point in the area.

5. Know where the closest “safer structure or location” is to the field or playing area, how long it takes to evacuate to that location for all personnel at the event, and have access to it. A safer structure or location is defined as:
  - a. Any building normally occupied or frequently used by people, i.e., a building with plumbing and/or electrical wiring that acts to electrically ground the structure. Avoid the shower, plumbing facilities, contact with electrical appliances and open windows/doorways during a thunderstorm.
  - b. In the absence of a sturdy, frequently inhabited building, any vehicle with a hard metal roof (neither a convertible, nor a golf cart) with the windows shut provides a measure of safety. The hard metal frame and roof, not the rubber tires, are what protects occupants by dissipating lightning current around the vehicle and not through the occupants. It is important not to touch the metal framework of the vehicle. Some athletics events rent school buses as safer locations to place around open courses or fields.
6. Lightning awareness should be heightened at the first flash of lightning, clap of thunder, and/or other signs of an impending storm such as increasing winds or darkening skies, no matter how far away. These types of activities should be treated as a warning or “wake-up call” to intercollegiate athletics personnel. Lightning safety experts suggest that if you hear thunder, begin preparation for evacuation; if you see lightning, consider suspending activities and heading for your designated safer

locations. For large-scale events, continuous monitoring of the weather should occur from the time pre-event activities occur throughout the event.

The following specific lightning safety guidelines have been developed with the assistance of lightning safety experts. Design your lightning safety plan to consider local safety needs, weather patterns and thunderstorm types.

- As a minimum, lightning safety experts strongly recommend that by the time the monitor observes 30 seconds between seeing the lightning flash and hearing its associated thunder or by the time the leading edge of the storm is within six miles of the venue, all individuals should have left the athletics site and be wholly within a safer structure or location. Individuals just entering the outdoor venue should be directed to the safer location.
- Please note that thunder may be hard to hear if there is an athletics event going on, particularly in stadiums with large crowds. Implement your lightning safety plan accordingly.
- Ensure a safe and orderly evacuation from the venue with announcements, signage, safety information in programs, and entrances that can also serve as mass exits. Planning should account for the time it takes to move a team and crowd to their designated safer locations.
- Lightning can strike from blue sky and in the absence of rain. At least 10 percent of lightning occurs when there is no rainfall and when blue sky is often visible somewhere in the sky, especially with summer thunderstorms. Lightning can, and does, strike as far as 10 (or more) miles away from the rain shaft. Be aware of local weather patterns and review local weather forecasts before an outdoor practice/event.
- Avoid using landline telephones, except in emergency situations. People have been killed while using a landline telephone during a thunderstorm. Cellular or cordless phones are safe alternatives to a landline phone, particularly if the person and the antenna are located within a safer structure or location, and if all other precautions are followed.
- To resume athletics activities, lightning safety experts recommend waiting 30 minutes after both the last sound of thunder and last flash of lightning is at least six miles away and moving away from the venue. If lightning is seen without hearing thunder, lightning may be out of range and therefore less likely to be a significant threat. At night, be aware that lightning can be visible at a much greater distance than during the day as clouds are being lit from the inside by lightning. This greater distance may mean that the lightning is no longer a significant threat. At night, use both the sound of thunder and seeing the lightning channel itself to decide on re-setting the 30-minute “return-to-play” clock before resuming outdoor athletics activities.

- People who have been struck by lightning do not carry an electrical charge. Therefore, cardiopulmonary resuscitation (CPR) is safe for the responder. If possible, an injured person should be moved to a safer location before starting CPR. Lightning-strike victims who show signs of cardiac or respiratory arrest need prompt emergency help. If you are in a 911 community, call for help. Prompt, aggressive CPR has been highly effective for the survival of victims of lightning strikes.

Automatic external defibrillators (AEDs) are a safe and effective means of reviving people in cardiac arrest. Planned access to early defibrillation should be part of your emergency plan. However, CPR should never be delayed while searching for an AED.

**Note:** Weather watchers, real-time weather forecasts and commercial weather-warning devices or services are all tools that can be used to aid in the monitoring and notification of threatening weather situations, decision-making regarding stoppage of play, evacuation and return to play.

## REFERENCES

1. Cooper MA, Andrews CJ, Holle RL, Lopez RE. *Lightning Injuries*. In: Auerbach, ed. *Management of Wilderness and Environmental Emergencies*. 5th ed. C.V. Mosby, 2007:67-108.
2. Bennett BL. A Model Lightning Safety Policy for Athletics. *Journal of Athletic Training*. 32(3):251-253. 1997.
3. Price TG, Cooper MA: *Electrical and Lightning Injuries*. In: Marx et al. *Rosen's Emergency Medicine, Concepts and Clinical Practice*, Mosby, 6th ed. 2006; 22: 67-78.
4. National Lightning Safety Institute website: [www.lightningsafety.com](http://www.lightningsafety.com).
5. Uman MA. *All About Lightning*. New York: Dover Publications. 1986.
6. NOAA lightning safety website: [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov).
7. Walsh KM, Hanley MJ, Graner SJ, Beam D, Bazluki J. A Survey of Lightning Safety Policy in Selected Division I Colleges. *Journal of Athletic Training*. 32(3):206-210. 1997.
9. Holle RL. 2005: *Lightning-caused recreation deaths and injuries*. Preprints, 14th Symposium on Education, January 9-13, San Diego, California, American Meteorological Society, 6 pp.
10. *The Weather Channel on satellite or cable, and on the Internet at [www.weather.com](http://www.weather.com)*.
11. Walsh KM, Cooper MA, Holle R, Rakov V, Roeder WP, Ryan M. National Athletic Trainers' Association Position Statement. *Lightning Safety for Athletics and Recreation*. *Journal of Athletic Training*. 48(2):258-270. 2013