



## **Background**

Lightning occurs when a combination of natural weather conditions come together to create an electrical impulse. Lightning can occur many miles from the parent thunderstorm – outside the actual storm and visible thundercloud. Caution must be exerted as the storm approaches as for a substantial time period after the storm.

A thunderstorm is formed from three different components: cold air, moisture and atmospheric instability. As a thunderstorm moves through an area, it gathers positively charged particles from tall objects on the ground. The negatively charged particles in the cloud are attracted to the positively charged particles. A "stepped leader" develops from the cloud to the ground; the return charge is the lightning we see. While trees, poles and other objects can be a part of the electrical pathway, so can we!! The lightning charge may create heat as high as 50,000 degrees. It can contain up to 100 million volts of energy. While the energy of lightning is significant, death is generally a cardiac event.

Approximately 1/3 of all individuals struck by lightning are involved in some type of recreational activity, either as a participant or as a spectator. According to the National Weather Service, there are approximately 66 fatalities from lightning strikes per year. Of those struck about 10% are killed and the other 90% are left with some degree of disability.

Lightning impacted the lacrosse community in May of 1991 at St. Albans in Washington, DC. Loss of life occurred when individuals took up shelter under a large tree. It is the obligation of all who participate in this great sport to educate and pre-plan for thunderstorms to prevent any future event.

The prevention of lightning casualties rides on one major premise – **EDUCATION!!** Educate the lacrosse community on the seriousness of lightning hazards, and the of practice lightning safety. Develop an emergency plan for action in the event of thunderstorms which are the precursors of lightning. Education and planning can result in the prevention of lightning casualties.

## **Recommendation of US Lacrosse**

It is the recommendation of US Lacrosse that all organizations, facilities, teams, coaches et al develop an emergency action plan in the instance of thunderstorms, thunderstorms and lightning charges or simply lightning charges. (Note: Lightning cannot occur without thunder, the hearing of thunder is dependent on geography). Following are storm and lightning specific recommendations to place within one's emergency plan.

## **Emergency Plan**

Prior to the individual practice/game, the outdoor weather should be noted. If a thunderstorm is imminent the practice/game should be suspended/postponed. Dark clouds, winds picking up in intensity, sounds of thunder, and lightning in the distance are enough clues that the weather is not conducive to good playing and spectating conditions. If the practice/game has begun, these signals should alert the coaches to suspend or postpone the event.

According to the National Athletic Trainer's Association (NATA), the emergency plan for lightning should comprise six segments. The emergency plan must take into consideration game and practice facilities. US Lacrosse Sports Science and Safety Committee recommend the following adjuncts to the NATA emergency plan. All of these recommendations should be in place prior to the first practice of the season.

***1. Leaving the field of play (practice/game).***

Rule books put the authority in the hands of the referee to make the call to leave the field in inclement weather. However, it is important that members of the coaching staff give appropriate input to the officials prior to the decision to seek safe shelter. At a practice, coaches are urged to use common sense to provide a safe environment for their charges.

***2. Outside weather observer.***

A member of the coaching staff who has few responsibilities during practice/play, a member of the supervisory staff for the event, and other appropriate lacrosse related individuals shall advise the officials on the change of the weather. Parents, fans and like individuals with varied vested interests shall not be involved in this action.

***3. Local Forecast.***

A member of the administrative staff, coaching staff or medical staff shall be assigned to monitor the weather forecast during the day. Changing weather conditions may make it necessary to bring in another individual to do the monitoring.

***4. Shelter.***

When it becomes evident that shelter may be necessary, team officials should employ the "30-30 Rule." That is, when one sees lightning – one begins counting in seconds until one hears thunder. If one hears thunder in 30 seconds or less, go quickly to shelter. Keep in mind that this rule cannot prevent against the first lightning strike. And, outdoor activities which require moving large groups of people to a distant shelter will require more time than that allotted by the "30-30 Rule".

Safe shelter shall be inside a substantial building, away from doorways, windows.

Baseball/Softball dugouts are not appropriate. The shelter shall be able to keep the athletes and fans comfortable for up to 1 hour or more. While less than ideal, an enclosed motor vehicle will suffice. Avoid contact with the steering wheel, ignition, keys and/or radio.

If one cannot get inside to a safe shelter, go to a lower elevation to minimize the risk. Stay away from fields, bleachers, trees, poles, light posts. Avoid unprotected open shelters, metal fences and structures.

If still trapped outside where there is imminent risk of being struck, there are steps one may take. Imminent risk may be noted by the hair on arms and neck standing straight up, skin tingling, hearing a crackling sound. Move several feet away from another person and use the "lightning crouch" to minimize one's risk. Put the feet together, squat down, tuck the head and cover the ears. When immediate threat of lightning has subsided go to a safe shelter.

***5. Suspension of Play.***

The recommendation from NWS, the NATA and the NFHS is that all athlete and fans shall remain in shelter for 30 minutes past the last lightning observed. US Lacrosse advises this waiting period.

## **6. Lightning detection devices.**

The technology today gives several options to athletic and recreational supervisors to employ for lightning detection. A caution however, these detectors rely on skilled installation and use. According to the National Weather Service (NWS) anecdotal evidence exists of systems failing to detect weak and/or intermittent lightning. There is also evidence of systems being installed incorrectly as well as used incorrectly. US Lacrosse Sport Science and Safety Committee will not recommend any particular manufacturer or lightning detection device. The purchase of any such safety equipment should be preceded by an evaluation of the needs of the program, training, geographical features of the facilities and designated users.

The recommendation of the NWS is to use these devices as a back-up to the "30-30 Rule."

The National Lightning Detection Network (NLDN) works to detect lightning activity in some regions. Alerts to a pager, email or cell phone may be available in your area by a commercial vendor.

The best detection however, may be the old dictum, "If you hear it, fear it; if you see it, flee it." Watch the sky, be ready to vacate the fields should thunderstorms start to develop and avoid the threat of lightning strikes altogether.

## **Emergency Care for the Injured.**

In the unfortunate circumstance that someone should be struck by lightning there are three key points to remember:

1. Activate your emergency plan;
2. Treat the injured person for a cardiac emergency immediately: CPR, EMS, AED;
3. Note that the injured person is no longer a threat to the rescuer as there is no continuation of electrical impulse through the victim.

## **Continuing Education.**

Please take the time to review the National Athletic Trainer's Association "Position Statement: Lightning Safety for Athletics and Recreation" for a full global look at developing an emergency plan as well as general information. Also access the sports medicine handbooks from the NCAA and NFHS for background as well as the NOAA website and others. The more informed the more complete the plan.

## **References:**

National Athletic Trainers' Association: [www.nata.org](http://www.nata.org)  
"Position Statement: Lightning Safety for Athletics and Recreation"  
Walsh, K; Bennett, B; Cooper, MA; Holle, R; Kithil, R; Lopez, R;  
Journal of NATA, 2000/Dec Vol 35, No. 4

## **Resources:**

National Weather Service: [www.lightningsafety.noaa.gov](http://www.lightningsafety.noaa.gov)  
National Federation of State High School Associations (NFHS): [www.nfhs.org](http://www.nfhs.org)  
NFHS Sports Medicine Handbook  
National Collegiate Athletic Association (NCAA): [www.ncaa.org](http://www.ncaa.org)  
NCAA Sports Medicine Handbook  
Lightning Strike and Electric Shock Survivors network: [www.lightning-strike.org](http://www.lightning-strike.org)  
The National Lightning Detection Network (NLDN): [www.lightningsafety.com](http://www.lightningsafety.com)