

Introduction to Lightning Safety

Summertime across the Ohio Valley means barbecues, festivals, sporting events, boating, hitting the beach, camping, and many other recreational activities. In short, summertime means a lot more people are spending a lot more time in the great outdoors. But summer is also the peak season for one of the nation's deadliest weather phenomena -- lightning. Lightning typically receives less attention than other storm-related killers because it does not result in mass destruction or mass casualties like tornadoes, floods, or hurricanes often do. But consider these lightning statistics:

- **About 25 million cloud-to-ground lightning strikes occur in the United States each year.**
- **Over the last 30 years, the U.S. has averaged 51 lightning fatalities per year.**
- **Only about 10% of people struck by lightning are actually killed. The other 90% must cope with varying degrees of discomfort and disability, sometimes for the rest of their lives.**
- **Typically, the vast majority of lightning victims each year are male (in 261 instances from 2006-2013, 81% of lightning fatalities were male and 19% were female).**

Lightning Safety Guidelines

Lightning is one of the most erratic and unpredictable characteristics of a thunderstorm. Because of this, no one can guarantee an individual or group absolute protection from lightning. However, knowing and following proven lightning safety guidelines can greatly reduce the risk of injury or death.

Most lightning victims are not struck during the worst of a thunderstorm but rather before or after the storm reaches its greatest intensity. This is because many people are unaware that [**lightning can strike as far as 25 miles away from its parent thunderstorm, much farther out from the area of rainfall within the storm!**](#)

Therefore, if you can hear thunder, you are within striking distance. Seek safe shelter immediately. Remember this lightning safety rule: **WHEN THUNDER ROARS, GO INDOORS...and stay there until 30 minutes after the last clap of thunder.** Do not wait for the rain to start before you decide to seek shelter, and do not leave shelter just because the rain has ended.

The best way to protect yourself and your family from the dangers of thunderstorms is to be prepared. If you have outdoor plans, be sure to familiarize yourself with the latest weather forecast before heading out. Consider taking a portable NOAA Weather Radio or AM/FM radio with you. Upon arriving on-site, determine where you will seek shelter in the event of a thunderstorm and how long it would take to reach that shelter. A sturdy, enclosed structure with plumbing and electrical wiring is safest, but if one is not available most enclosed metal vehicles are safe alternatives.

During your outdoor activities, keep an eye to the sky for developing thunderstorms. If thunder is heard, if lightning is seen, or even if thunderclouds are developing, get to your place of shelter without delay! The table below gives examples of adequate and inadequate types of shelter for lightning safety.

Being inside a house or other building with electrical wiring and plumbing is your safest option during a thunderstorm, but it does not guarantee you will be 100% safe from lightning. There are still some lightning safety guidelines you must follow while inside a place of shelter to keep yourself safe.

- **Don't use corded phones:** Using a corded phone during a thunderstorm is one of the leading causes of indoor lightning injuries. However, it IS safe to use cordless or cell phones as long as they are not being charged.
- **Stay away from windows and doors:** Sitting on an open porch to watch a thunderstorm is also dangerous. It is best to be in an interior room during a thunderstorm.

- **Don't touch electrical equipment or cords:** Any device that uses electricity (e.g. computers, televisions, household appliances, etc.) is susceptible to a lightning strike. Electrical surges caused by lightning can damage electronics (even at some distance from the actual strike), and a typical surge protector will do little to protect the device (or the person using it) if lightning should strike. So consider unplugging certain appliances or electronics, but for your own safety do this **BEFORE** the storm arrives.
- **Avoid plumbing:** Metal plumbing and the water inside are both very good conductors of electricity. Therefore, do not wash your hands or dishes, take a shower or bath, do laundry, etc. during a thunderstorm.
- **Refrain from touching concrete surfaces:** Lightning can travel through the metal wires or bars in concrete walls and flooring, such as in the basement or garage.
- **If inside a vehicle:** Roll the windows up and avoid contact with any conducting paths leading to the outside of the vehicle (e.g. metal surfaces, ignition, portable electronic devices plugged in for charging, etc.).

Lightning Myths and Facts

Myth: A lightning victim is electrified. If you touch him, you'll risk being electrocuted.

Fact: The human body does not store electricity, and lightning victims require immediate medical attention. It is perfectly safe to touch a lightning victim in order to give them first aid. Call 911 for help.

Myth: If it's not raining or there aren't any clouds overhead, you're safe from lightning.

Fact: Lightning often strikes several miles from the center of a thunderstorm, far outside the rain or thunderstorm cloud. In fact, "[bolts from the blue](#)" can strike as far as 25 miles out from the parent thunderstorm. That's why it's important to seek shelter at the first indication of a thunderstorm and stay there until 30 minutes after the last clap of thunder.

Myth: The rubber soles of shoes or rubber tires on a car will protect you from a lightning strike.

Fact: Rubber-soled shoes and rubber tires provide NO protection from lightning, but most vehicles with metal tops and sides do provide adequate shelter from lightning because the charge travels through the metal frame and eventually into the ground. Just be sure to avoid contact with anything inside the vehicle that conducts electricity. Remember, convertibles, motorcycles, bicycles, open-shelled outdoor recreational vehicles and cars with fiberglass shells offer no protection from lightning.

Myth: "Heat Lightning" occurs after very hot summer days and poses no threat.

Fact: Many people incorrectly think that "heat lightning" is a specific type of lightning. Actually, it is just lightning from a thunderstorm that is too far away for any thunder to be heard (thunder is seldom heard beyond 10 miles under ideal conditions). If the storm approaches, the same lightning safety guidelines above should be followed.

Myth: Lightning never strikes the same place twice.

Fact: Lightning often strikes the same place or object repeatedly, especially if it's tall, pointy, and isolated. The Empire State Building is struck by lightning nearly 100 times each year.

Myth: If caught outside during a thunderstorm, you should seek shelter under a tree.

Fact: Seeking shelter under a tree is one of the leading causes of lightning related fatalities. Remember, **NO PLACE outside is safe when thunderstorms are in the area.** If you are caught outside in a thunderstorm, keep moving toward a safe shelter.

Myth: Metal structures or metal on the body (jewelry, watches, etc.) attract lightning.

Fact: The presence of metal has no bearing on where lightning will strike. Mountains are made of rock but get struck by lightning many times a year. Rather, an object's height, shape, and isolation are the dominant factors that affect its likelihood of being struck by lightning. While metal does not attract lightning, it obviously does conduct electricity, so stay away from metal fences, railings, bleachers, etc. during a thunderstorm.

Myth: If caught outside during a thunderstorm, you should lie flat on the ground.

Fact: **NO PLACE outside is safe when thunderstorms are in the area.** If you are caught outside in a thunderstorm, keep moving toward a safe shelter.

Medical Aspects of Lightning

If someone is struck by lightning, they may need immediate medical attention. Lightning victims do not carry an electrical charge and are safe to touch. Call 911 and monitor the victim. Start CPR or use an Automated External Defibrillator if needed.

What are the Medical Symptoms?

Lightning is primarily an injury to the nervous system, often with brain injury and nerve injury. Serious burns seldom occur. People who do not suffer cardiac arrest at the time of the incident may experience lesser symptoms, which often clear over a few days:

- Muscle soreness
- Headache, nausea, stomach upset and other post-concussion types of symptoms
- Mild confusion, memory slowness or mental clouding
- Dizziness, balance problems

Longer Term Problems

Most survivors experience only some of the symptoms below:

- Problems coding new information and accessing old information
- Problems multitasking
- Slower reaction time
- Distractibility
- Irritability and personality change
- Inattentiveness or forgetfulness
- Headaches which do not resolve with usual OTC meds
- Chronic pain from nerve injury
- Ringing in the ears and dizziness or balance problems
- Difficulty sleeping, sometimes sleeping excessively at first and later only two or three hours at a time

Delayed Symptoms

- Personality changes/self-isolation
- Irritability and embarrassment because they can't remember people, job responsibilities and key information
- Difficulty carrying on a conversation
- Depression
- Chronic pain and headaches

Friends, family and co-workers who see the same external person may not understand why the survivor is so different. Friends may stop coming by or asking them to participate in activities or survivors may self-isolate out of embarrassment or irritability. As with other disabilities, families who are not committed to each other are more likely to break up.

Lightning Safety on the Job

Some workers are at greater risk than others. People who work outdoors in open spaces, on or near tall objects, with explosives or with conductive materials such as metal have a greater exposure to lightning risks. Workers in these occupations face the most risk:

- Logging
- Explosive handling or storage
- Heavy equipment operation
- Plumbing and pipe fitting
- Construction and building maintenance
- Farming and field labor
- Telecommunications field repair
- Power utility field repair

When thunderstorms threaten, don't start anything you can't quickly stop. Pay attention to the daily forecasts (www.nws.noaa.gov) so you know what to expect during the day. Also pay attention to early signs of thunderstorms: high winds, dark clouds, rain, distant thunder or lightning. If these conditions exist, do not start a task you cannot quickly stop.

Know your company's lightning safety warning program. Businesses that have high risk functions, such as explosive storage or field repairs, should have a formal lightning warning policy that meets two basic requirements:

1. Lightning danger warnings can be issued in time for everyone to get to a safe location
2. [Access to a safe place](#)

Assess your lightning risk and take appropriate actions. During thunderstorms no place outside is safe. If you can hear thunder, lightning is close enough to strike. Stop what you are doing and seek safety in a substantial building or a hard-topped metal vehicle.

Know what objects and equipment to avoid during a thunderstorm.

- Stay off and away from anything tall or high, including rooftops, scaffolding, utility poles and ladders.
- Stay off and away from large equipment such as bulldozers, cranes, backhoes, track loaders and tractors.
- Do not touch materials or surfaces that can conduct electricity, including metal scaffolding, metal equipment, utility lines, water, water pipes and plumbing.
- Leave areas with explosives or munitions.

National Weather Service (National Oceanic and Atmospheric Administration NOAA)

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