

Lightning is a serious danger. Summer is the peak season for this deadly weather phenomenon, with Florida being the "lightning capital of North America". With an average of almost 1.4 million cloud-to-ground lightning strikes each year and typically leading the nation in lightning deaths and injuries, learning about lightning and its dangers, as well as important safety measures, can greatly reduce your risk from being affected by lightning.

The National Weather Service has declared June 22-28, 2014 as National Lightning Safety Awareness Week.

Thursday's topic is on indoor lightning safety.

Statistics tell us that we are much less likely to become a lightning victim if we remain inside a substantial building when thunderstorms are nearby. Most people struck by lightning are in open areas or out on the water while others are struck when near some type of machinery. However, some people are killed or injured by lightning even though they are indoors.

Safe shelters

A house or other substantial building offers the best protection from lightning, but it is important to consider what happens if the structure is hit by lightning. For a shelter to provide protection from lightning, it must contain a way to conduct the electrical current from the point of contact to the ground. These mechanisms can be on the outside of the structure, may be contained within the walls of the structure, or a combination of the two. On the outside, lightning can travel along the outer shell of the building or may follow metal gutters and downspouts to the ground. Inside a structure, lightning can follow rebar within concrete walls or floors, electrical wiring, plumbing and telephone lines to the ground. Also, a hard-topped all-metal vehicle with all windows closed can be used as shelter if no substantial building is around.



Avoid unsafe shelters

Unless specifically designed to be lightning safe, small structures such as those found on athletic fields, parks, golf courses, picnic areas and schoolyards do little to protect occupants from lightning. Also, vinyl and metal sheds should be avoided during thunderstorms. Vehicles such as convertibles offer no safety from lightning, even if the top is "up". Other vehicles which are not safe during lightning storms are those which have "open" cabs, such as golf carts, open cab tractors/construction equipment, etc.



How lightning enters a house or building.

There are 3 main ways lightning enters homes and buildings:

- A direct strike
- Through wires or pipes that extend outside the structure
- Through the ground

Regardless of the method of entrance, once in a structure, lightning can travel through electrical, phone, plumbing and radio/television reception systems. Lightning can also travel through any metal wires or bars in walls or flooring.



Stay safe while inside

Phone use is the leading cause of indoor lightning injuries in the United States. If lightning is nearby, refrain from using the telephone unless it is an emergency. Cordless and cell phones are safer to use, but do not offer full protection from lightning. Computers are also dangerous, as they usually are connected to both phone and electrical cords. Stay away from windows, doors, porches and garages as these can provide the path for a direct strike to enter a home. Avoid washers and dryers since they not only have contacts with the plumbing and electrical systems, but also contain an electrical path to the outside through the dryer vent. Do not wash your hands, take a shower or wash dishes as any lightning current travelling through plumbing can channel through water. Also, exit pools or tubs immediately, even if it is indoors.



If seeking shelter in a car, try to avoid touching the ignition switch, radio dial or other metal objects. (Contrary to popular belief, the vehicle's rubber tires DO NOT "insulate" you from the lightning. The vehicle's metal shell conducts the lightning around and away from you.)

Protect your personal property

Lightning also causes significant damage to personal property each year. Lightning generates electrical surges that can damage electronic equipment some distance from the actual strike. This can overload and short out outlets and anything plugged in. Sometimes, shorted out appliances or devices can start a fire. Not all surge protectors protect equipment from a lightning strike. Unplug any sensitive or costly appliances or equipment before a thunderstorm threatens.

Every year, lightning causes forest, grass, and house fires across the U.S. According to the National Fire Protection Association, lightning causes an average of about 4,400 house fires each year, costing somewhere around \$283 million in damages. In addition, wildfires caused by lightning burn an average of 5.5 million acres annually. About 16 fire deaths are attributed to lightning-caused fires each year, most of which are the occupants of houses that ignited by lightning. The heat generated by a lightning strike can be thousands of degrees. This can create an intense fire in microseconds. In time the rains will extinguish the fire if the rain is hitting the actual fire, but frequently the actual fire is shielded from direct rainfall. Often the fire extends past the roof and into the structure, involving dry materials inside.



Lightning Protection Systems

A simple lightning protection system can cost as little as a few hundred dollars for an average 2-story house. This includes a lightning rod atop the roof with an insulated cable running to a ground. A more complex and secure system, with several lightning rods placed around the roof and several ground electrodes, may cost **\$2000-\$3000** for an average 2-story house. The price dips a bit for a one-story house and rises slightly higher for a 3-story house. This is primarily due to the materials cost for the metal conducting wire. Another component useful for a good lightning protection design is a surge arrester. A surge arrester will stop any abnormal current from entering your home's internal wiring. It will typically cost **\$100-\$200**.

Remember your pets

You may want to consider the safety of family pets or agricultural livestock during thunderstorms. Dog houses and barns are not lightning-safe. Also, animals chained to trees or fences can easily fall victim to a lightning strike.



Summary of lightning safety tips while inside

- A house or other substantial building offers the best protection from lightning. Stay inside during a storm.
- Avoid contact with electrical equipment. If you plan to unplug any equipment, do so well before the storm arrives.
- Avoid contact with plumbing and water.
- Stay away from windows and doors, and stay off porches, sheds and garages.
- Do not lie on concrete floors and do not lean against concrete walls.

For more information about lightning and lightning safety, visit
[HTTP://WWW.LIGHTNINGSAFETY.NOAA.GOV](http://www.lightningsafety.noaa.gov)

Friday's topic will focus on the medical aspects and facts about lightning strike victims.