

Weather

Weather - Lightning

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Who should be concerned about lightning?

Lightning kills more people in Canada than hail, wind, rain, and tornadoes combined, making lightning an important safety consideration. This fact is especially true for people who work outdoors. While the odds of getting struck by lightning are less than one in a million, Environment Canada (2021) says lightning kills 2 to 3 people every year in this country and injures another 180 people. Most of these injuries and fatalities occur between June and August. Most fatalities were people in open areas or taking shelter under a tree.

Knowing what to do when lightning is close is especially important for people who work outdoors. For example, outdoor recreation participants, construction workers, road crews, landscapers, and farm workers are at increased risk due to the nature of their work. Employers need to recognize the hazards associated with storms and, where appropriate, have safe procedures and work systems in place to minimize the risk of injury or harm to workers, and should review these policies seasonally.

Having a preparedness plan and taking safety measures can prevent many lightning deaths and injuries.

Lightning safety procedures may include:

- monitoring the weather forecast and alerts
- outlining what actions workers must take when hearing thunder, or seeing lightning or warning signs of an approaching storm

- having a procedure to notify workers about lightning safety warnings
- identifying safe locations and shelters
- requiring workers to reach a safe location within a specified time period
- establishing criteria for stopping and restarting outdoor work activities
- making sure the public is evacuated, for example, at a golf course, public beach, or swimming pool
- checking in with all workers after a storm has passed
- training workers on the lightning preparedness plan

Due to climate change, there has been an increase in extreme weather events. It's important to know when there's a risk and what to do in these situations. For more information, see [Climate Change: Extreme Weather - Preparing for Climate Related Emergencies](#).

What should I know about lightning?

A lightning bolt is a million times more powerful than household current, carrying up to 100 million volts of electricity. When someone is struck by lightning, an electrical shock occurs that can cause burns and even stop the person's breathing. Although thunder and lightning can occur occasionally during a snowstorm, April to October are the prime thunderstorm months, with the highest number of cloud-to-ground lightning flashes occurring in July in Canada. Thunderstorms occur most often in late afternoon or evening, and around sunrise. Knowing how lightning behaves can help you plan for an approaching storm. It tends to strike higher ground and prominent objects, especially those made of good electrical conductors, such as metal. Thunder can be a good indicator of lightning – loud crackling means it's close, whereas rumbling means the storm is further away. Lightning can strike as far as 16 kilometres outside of rainfall areas.

Because light travels faster than sound, you will see lightning before you hear the thunder. Each second between the flash and the thunderclap represents about 300 metres. If you can hear thunder, you are within striking distance. Immediately go to the nearest well-constructed building or a fully enclosed, metal-topped vehicle. There is NO safe place to be outside in a thunderstorm. Remain in the sheltered area for at least 30 minutes after you hear the last thunder. Secondary effects of lightning include electrical fires and [wildland fires](#).

What steps should people take to protect themselves?

Protection from lightning begins before the storm. Paying attention to weather conditions and forecasts allows time to plan for threatening weather and to act appropriately.

The safest place to be during a thunderstorm is in a well-constructed building. A well-constructed building is one that is fully enclosed with a roof, walls and floor and that has electrical wiring, plumbing, telephone line, or antennas to ground the lightning should the building be hit directly.

Even when inside the building, there are safety precautions to take:

- Keep as many walls as possible between you and the outside. Stay away from doors, windows, and fireplaces.
- Stay away from anything that conducts electricity, such as radiators, stoves, sinks, and metal pipes.
- Use battery-operated appliances only. Avoid handling electrical appliances and regular telephones (cordless phones and cell phones do not increase the risk of a lightning strike).

The next best place for shelter is an enclosed metal car, truck or van, but NOT a tractor, golf cart, topless, or soft-top vehicle. Make sure the vehicle is not parked near trees or other tall objects that could fall over during a storm. When inside a vehicle during a lightning storm, close the windows, sit with your hands in your lap, and wait out the storm. Don't touch any part of the metal frame or any wired device in the vehicle (including the steering wheel or plugged-in cell phone). A direct strike to your car will flow through the frame of the vehicle and usually jump over or through the tires to reach the ground. Be aware of downed power lines that may be touching your car. You are safe inside the car, but you may receive a shock if you step outside. Stay inside for 30 minutes after the sound of thunder ends.

Unsafe shelters are buildings or structures without electricity or plumbing to ground the lightning, as they do not provide any lightning protection. Shelters that are unsafe include covered picnic shelters, carports, tents, baseball dugouts, as well as other small non-metal buildings (sheds and greenhouses).

What should you do if you cannot find shelter?

There is no safe place to be outdoors during a thunderstorm (except in appropriate shelters that are described above). However, there are areas that might be less dangerous and help reduce the risk of being struck by lightning when outside.

Stay away from things that are tall (trees, flagpoles or posts), water, and other objects that conduct electricity (tractors, metal fences, lawn mowers, golf clubs).

You do not want to become a prime target by being the highest object in the landscape. Take shelter in low-lying areas, such as valleys or ditches, but watch for flooding.

If you are with a group of people in the open, spread out several metres apart from one another.

What should you do if someone has been hit by lightning?

People who have been struck by lightning are safe to touch. Bystanders shouldn't hesitate to save a life by calling for help. If the person is not breathing or they do not have a pulse, a trained rescuer should administer cardio-pulmonary resuscitation (CPR).

What should you do if you hear thunder?

When Environment and Climate Change Canada issues a storm warning, or if you can already hear thunder, remember to take shelter from the storm and protect yourself. There are also commercially available personal lightning detection devices that can be carried by a person to help warn about how close a storm is. There are also lightning-strike alert applications available that notify users when lightning is nearby.

Preparedness for a storm is essential. Listen to your local forecast for the possibility of thunderstorm activity. Keep an eye on the sky. If the sky suddenly darkens, be prepared to take shelter.

Where can I get more information?

Learn more about summer hazards on the [Environment and Climate Change Canada](#) website.

(We have mentioned these organizations as a means of providing a potentially useful referral. You should contact the organization(s) directly for more information about their information and/or services. Please note that mention of these organizations does not represent a recommendation or endorsement by CCOHS of these organizations over others that you may know.)

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