

Weather

Weather - Lightning

On this page

[Who should be concerned about lightning?](#)

[What should I know about lightning?](#)

[What steps should people take to protect themselves?](#)

[What should you do if you cannot find shelter?](#)

[What should you do if someone has been hit by lightning?](#)

[What should you do if you hear thunder?](#)

[Where can I get more information*?](#)

Who should be concerned about lightning?

Lightning kills more Canadians 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 80 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, those involved in outdoor recreation, construction workers, road crews, landscapers and farm workers). Employers need to recognize the hazards associated with electrical storms and, where appropriate, have safe procedures and work systems in place, to minimize the risk of injury or harm to employees, 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:

- 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 are evacuated, for example at a golf course, public beach, or swimming pool
 - checking in with all workers after a thunderstorm has passed
 - training workers on the lightning preparedness plan
-

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 materials that are good conductors of electricity, 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.

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 react 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 with 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 will conduct 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, roll up the windows and 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 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).

Secondary effects of lightning include electrical fires and forest fires.

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 on 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.

If you get caught in a level field far from shelter, crouch down on the balls of your feet immediately, with feet together, place your arms around your knees and bend forward. Be the smallest target possible, and at the same time, minimize your contact with the ground. Don't lie flat.

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

Lightning victims are safe to touch. Bystanders shouldn't hesitate to save a life by calling for help. If the victim 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 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 on a person to help warn about how close a storm is.

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 Canada](#) web site.

More about lightning safety is also available from the [National Weather Service](#) or the [National Lightning Safety Institute](#) in the United-States.

(*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.)

Acknowledgement

The Canadian Centre for Occupational Health and Safety (CCOHS) would sincerely like to thank Environment Canada for their assistance in developing the original version of this document.

Fact sheet confirmed current: 2016-11-01

Fact sheet last revised: 2021-01-25

Disclaimer

Although every effort is made to ensure the accuracy, currency and completeness of the information, CCOHS does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current. CCOHS is not liable for any loss, claim, or demand arising directly or indirectly from any use or reliance upon the information.