



Before lightning strikes

Between 1991 and 1995 the death certificates of 27 Canadians listed code E907 (lightning, excluding injury from fall of a tree or other object caused by lightning¹) as the cause of death.² A recent report from the US Centers for Disease Control and Prevention describes 3 cases that exemplify the diverse circumstances in which lightning can cause death.³

In July 1997 a 47-year-old man was struck by lightning while golfing at a driving range in Florida. The skies were clear at the time, but a storm must have been forming in the area. Emergency medical personnel arriving about 10 minutes after the man was struck found no pulse or spontaneous respiration. Although they were able to re-establish vital functions, the patient's pupils were fixed and dilated, and he died the next afternoon. Autopsy showed burns on the left hand and a second-degree burn with vesicle formation on the right side of the back. There were petechiae on the anterior and posterior surfaces of the heart, and the brain was edematous and had hypoxic injury to the neurons.

In September 1996 a 14-year-old boy was struck by lightning while riding his motorcycle during a thunderstorm. The bolt hit a tree, travelling along its trunk and then jumping to the motorcycle and the rider's feet and groin. Although the patient was taken to hospital and resuscitated, he died 5 days later. At autopsy the brain was swollen and had axial herniation and hypoxic injury to the neurons. The hair on the right side of the chest was singed, and there was damage to the pectoralis muscles. There were multiple microscopic foci of myocardial necrosis.

The third case involved a 34-year-old woman who was carrying metal screws in her breast pocket and a cordless hand drill in her hand when she was struck by lightning in April 1997. The strike occurred after a thunderstorm had passed through the area. Cardiopulmonary resuscitation performed immediately by a neighbour and later by emergency medical personnel was unsuccessful. The clothing on her upper torso was torn, and the torso itself had the characteristic arborization pattern of a lightning strike (erythematous marks in a branching pattern).

Of the 27 Canadian deaths by lightning 11 occurred in Ontario, 6 in Quebec, 6 in the Prairies, 3 in the Maritimes and 1 in BC. Men, particularly those between 15 and 50 years of age, were much more likely to be killed by lightning.

Lightning occurs in all thunderstorms. A cloud-to-ground strike is the most dangerous. The danger may not be apparent, as indicated by the circumstances of the first case described earlier — lightning can strike up to 16 km away from the rain of a thunderstorm. About 30% of people struck by lightning die, and many of those who survive have permanent disabilities.³ The following precautions can be taken to prevent injury and death caused by lightning.³

- When participating in outdoor activities, be aware of the weather forecast during thunderstorm season (generally May through September in the northern hemisphere).
- Because lightning often precedes the rain of the thunderstorm, start preparations to avoid potential lightning strikes before the rain begins.
- When you hear thunder, seek shelter inside the nearest building or an enclosed vehicle. If shelter is not available, avoid standing close to trees or tall objects, because electricity may be conducted from that object to other nearby objects or people.
- Avoid high ground, water and open spaces, and don't touch metal objects such as golf clubs, umbrellas, fences or tools.
- If you are indoors when a storm begins, turn off all appliances and electronic devices, and stay inside until the storm passes.



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