

## THE REAL DANGERS OF LIGHTNING

Information supplied by Surge Technology, 'Surgetek'

We all know that clouds shaped like cauliflowers, upcoming winds, rolls of thunder, and sheet lightning, are all signs that a thunderstorm is approaching. However, it is important to observe the time period between a flash and thunder - a period shorter than 5 seconds means acute danger.

When you experience a flash, it travels at (299 792 458 meters per second) 300 000 km/sec - this is the speed of the light you see. It is approximately 900 000 times faster than the sound you hear as thunder. This is why you see the flash quite a while before you hear the thunder. By listening and counting you can easily estimate how far the lightning is from your location. If the thunder immediately follows the flash, your life is at risk. It is approximately 3 seconds per km but if you can count to six you are already in danger.

When you are outside there are two main dangers: When you are higher than the surrounding area, you are in danger of being directly hit by the strike. There is also the indirect risk of being hit, when something is struck near to you. The current is conducted quickly into the ground and can therefore hurt you due to step and touch potentials developed between your feet.

It is often asked if we are safe in our cars during a lightning storm. The car, provided it is fully closed (no convertible models and the windows closed), provides entire protection. It functions the same way as a Faraday's cage. Nevertheless, you should remove or fold down the aerial. So as not to be blinded by the light and therefore lose control, it is advisable to stop at the next possible place. Do not leave the car as long as the period between flash and thunder is less than 6 seconds.

The Faraday cage is an electrical apparatus designed to prevent the passage of electromagnetic waves, either containing them in or excluding them from its interior space. It is named after physicist Michael Faraday, who built the first one in 1836. Faraday stated that the charge on a charged conductor resided only on its exterior, and had no influence on anything enclosed within it. To demonstrate this fact he built a room coated with metal foil, and allowed high-voltage discharges from an electrostatic generator to strike the outside of the room. He used an electroscope to show that there was no excess electric charge on the inside of the room's walls.

This shielding effect is used to eliminate electric fields within a volume, for example to protect electronic equipment from lightning strikes and other electrostatic discharges.

An aircraft also behaves like a Faraday's cage. Normally nothing happens if it is struck. However, the occurring turbulences are much more dangerous and is why experienced pilots try to avoid thunderstorms.

What are the dangers when camping during a thunderstorm? Do not erect your tent directly next to poles or pylons or at the edge of the forest or next to single trees. It is reasonably safe to put it up directly in the forest. Use an insulating mattress and do not touch the poles inside the tent during a thunderstorm. As with the car, trailers and caravans are protected by the Faraday principle.

The golf course is the most dangerous place during a thunderstorm! Avoid single trees and the edge of the forest, avoid touching metal (especially clubs and caddy) and avoid being in open terrain. Shelter huts protect only when equipped with external lightning protection. If there is no reliable shelter hut, and the next house or car is too far away, squat down, feet close together and wrap your arms around your legs. Make sure that all parts containing metal (i.e. golf bag, umbrella) are at least 5 m away from you.

Sportsmen and sportswomen, as well as spectators, are highly at risk during a thunderstorm. A very dangerous place is on the stand next to poles or flagpoles. Keep about 3 m away from them and put away umbrellas or flags. Covered stands need complete external lightning protection to provide safety.

Is it dangerous to go surfing or wind surfing? Absolutely! Surfing during a thunderstorm means you are placing your life at risk. There is absolutely no protection on a surfboard. Look out for a change in clouds and wind. Head for the shore at the first sign of an imminent thunderstorm. If there is no time left for that you should put down the mast and squat down on the board, feet closely together, arms wrapped around your legs. This situation is extremely dangerous and should be avoided.

If you are onboard a ship, keep off the deck during a thunderstorm and do not touch any metal. If you own a boat, take some protection measures such as lengthening the shrouds by using metal cables up to the surface. It works as an earthing device.

Being in or even near the water during a thunderstorm is highly dangerous. A strike into the water may be deadly to man up to 90 m from the impact. If not deadly at first, it may paralyze and thus cause drowning. Keep away from water during a thunderstorm! Being on or near the water is extremely dangerous, even when fishing, put down your fishing rod and leave the water.

A thunderstorm in the mountains is especially dangerous because it appears surprisingly quickly. Have a close look at the weather forecast when planning your tour. If you meet a thunderstorm, try to reach the next shelter hut. If that is not possible, keep off the peak (remember not to be at the highest point - climb down a little if you are there) and squat down, feet close together and arms wrapped around your legs. Do not touch moist rock and do not touch metal ladders or other metal parts. A cave may provide shelter. Before starting again wait until the thunderstorm has really disappeared.

These protection measures seem very obvious, however, it is amazing how they can be ignored or forgotten in the face of an actual thunderstorm. It is worthwhile to take the time now, to inform everyone in your family of the real dangers of lightning storms.

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On behalf of Surgetek  
P O Box 3109  
Randburg  
2125  
Tel: (011) 792-1303/4/5  
Fax: (011) 793-6928  
E-mail: [info@surgetek.co.za](mailto:info@surgetek.co.za)  
[Http://www.surgetek.co.za](http://www.surgetek.co.za)  
Contact: Paul van As  
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