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Lightning at Leisure

Lightning strikes the ground in Britain about 300,000 times a year. For the climber, fisher, walker, golfer, and other exposed persons, this is a risk that must be considered. Although there is no absolute protection from lightning, measures can be taken to reduce the risk of getting struck and the injury severity. This factsheet provides information about lightning, statistics, and precautions, both for the individual, and advice for strategies that can be taken by leisure operators and event organisers.



The Risk

30-60 people are struck by lightning each year in Britain, and on average, 3 (5-10%) of these strikes are fatalⁱ. UK mortality statistics show that in 2005 there were two fatalities caused by lightning strikesⁱⁱ. Those most at risk are those who are outdoors often, exposed in vulnerable, unsheltered locations. These are predominantly people who are often outdoors, for example:

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|------------------------|-----------------|------------------------|
| ▪ Golfers | ▪ Rock climbers | ▪ Campers |
| ▪ Hill walkers | ▪ Fishers | ▪ Outdoors DIY |
| ▪ Swimmers | ▪ Boaters | ▪ Agricultural workers |
| ▪ Construction workers | | |

80% of lightning strike victims are male, however this can be compared with the higher number of males in outdoor employment and participating in outdoor leisure activities than females. Research has also shown that proximity to water increases the risk of being struck by lightning. The time that is most dangerous is when there is underestimation of the likelihood of being hit, for example before the storm or when you think it is over.

There are three different ways of being struck by lightning:

1. Direct Strike: the lightning hits you and goes to earth through you.
2. Side Flash: the lightning hits another object and jumps sideways to hit you.
3. Ground Strike: the lightning strikes the ground then travels through it hitting you on the way.

Flash to Bang

To check if a storm is coming or going from where you are standing apply the flash to bang principle, counting as soon as the lightening flash is seen until the thunder is heard. 'Flash to bang' is based on the following facts:

1. Sound travels at 330 meters per second or at 1 km in 3 seconds (approximately 1 mile every 5 seconds).
2. Light travels at 300,000 km per second.
3. Lightning will always be seen before thunder.

To calculate the distance between yourself and the storm divide the number of seconds by 3 to find the distance in kilometres.

If the distance between the thunder and lightning increases over a couple of strikes, the storm is moving away from you. If it decreases, it is coming towards you.

30/30 Rule

Research shows that people struck by lightning are predominantly hit before and after the peak of the storm. This means that you should be thinking about the proximity of the lightning, not the occurrence of rain. The 30/30 rule provides a good way of ensuring one is sheltering during the most risky parts of the storm. It proposes that if the flash to bang is 30 seconds in length or less you should seek shelter. Staying inside this shelter is advised until 30 minutes past the last clap of thunder. This ensures that any distant strikes at the beginning of the storm (lightning can travel up to 10 miles), or trailing storm clouds at the back of the storm do not take anyone by surprise.

Seeking Shelter

- Ideally, seek shelter inside a large building or a motor vehicle keeping away from, and getting out of wide, open spaces and exposed hilltops.
- If you are exposed to the elements with nowhere to shelter, make yourself as small a target as possible by crouching down with your feet together, hands on knees and your head tucked in. This technique keeps as much of you off the ground as possible.
- The inside of a car is a safe place to be in a storm, lightning will spread over the metal of the vehicle before earthing to the ground through the tyres.
- If you are golfing and the clubhouse is too far away, your best protection is to leave your clubs and crouch down in a bunker.
- Do not shelter beneath tall or isolated trees, it has been estimated that one in four people struck by lightning are sheltering under treesⁱⁱⁱ.
- If you are on water, get to the shore and off wide, open beaches as quickly as possible as water will transmit strikes from further away. Studies have shown that proximity to water is a common factor in lightning strikes.

Individual Safety

- Before you set off for your day, check the weather forecast. If there are storms are predicted think about doing something less exposed, or being somewhere that provides appropriate shelter nearby.
- When choosing a campsite try to choose a site where tents are not the highest points. In a storm, if you remain in your tent, try not to get too close to poles or other metal objects.
- Be aware of objects that can conduct or attract lightning, for example, golf clubs, umbrellas, motorbikes, bicycles, wire fencing and rails. If you have a metal object that is not necessary for your safety (i.e. climbing gear that is in use) put it aside.
- Seek shelter quickly if your hair begins to stand on end and nearby appliances begin buzzing - it may mean lightning is about to strike.
- Inside a house lightning can be conducted through television aerials, piping or other wires. Except in cases of emergency, don't use your telephone (landline or mobile) until the storm is over.

Employers/Event Organisers

Workplaces have a duty to ensure the health, safety and welfare of their staff under the Health and Safety at Work Act 1974 Section 2(1). If staff are working outdoors in exposed areas, this must be reflected in the risk assessment.

Events must be thoroughly risk assessed, and if there is a risk of being struck by lightning this must be looked at and control measures put in place with a lightning safety plan.

Think about the following recommendations^{iv}:

- In case of an event, monitor the local weather from the day before activity to the end of play and the dispersal of crowds.
- Have an efficient method of warning people at risk, and evacuation if necessary.
- Define and list safe structures and locations. Safe structures can include a large/substantial building with plumbing and wiring that will conduct lightning to the ground such as a clubhouse, or fully enclosed metal vehicles including buses.
- Determine criteria for suspension and resumption of activity – for example, use the 30/30 rule.
- Ensure the dissemination of information – participants, officials, spectators, and staff must be aware of potential dangers and how to minimise the risk of injury.

In Case of Emergency

If someone is hit by lightning, call emergency services – they will need help as soon as possible. If you know first aid, apply it – you will not receive an electric shock. A lightning strike is not usually instantly fatal, victims' hearts and/or breathing may stop however, so quick application of CPR will likely save their life.

References & Further Information

British Mountaineering Council, *Safety on Mountains Booklet*

Crosby, A., *The Mountain Pocket Book*, Cordee, 1999

Makdissis, M. and P. Brukner, *Recommendations for lightning protection in sport*, Medical Journal of Australia, Volume 177, 1 July 2002.

RoSPA "A bolt from the blue" Water & Leisure, Winter 1994/1995

Office of National Statistics DH2 no.32

BBC Health, First Aid http://www.bbc.co.uk/health/first_aid/

BBC Weather, Lightning Safety

http://www.bbc.co.uk/weather/features/understanding/lightning_safety.shtml

British Mountaineering Council <https://www.bmcinsurance.co.uk>

St John Ambulance Life-Saving Procedures <http://www.sja.org.uk/sja/first-aid-advice/life-saving-procedures/primary-survey.aspx>

Met Office Lighting pages

<http://www.metoffice.gov.uk/education/secondary/students/lightning.html>

<http://www.metoffice.gov.uk/climate/uk/averages/lightning.html>

Tornado and Storm Research Organisation

<http://www.torro.org.uk/TORRO/research/lightning.php>

The UK Storm Guide <http://www.ukstorms.com/>

ⁱ Tornado and Storm Research Organisation website:

<http://www.torro.org.uk/TORRO/research/lightning.php>

ⁱⁱ Office of National Statistics DH2 no.32.

ⁱⁱⁱ RoSPA "A bolt from the blue" Water & Leisure, Winter 1994/1995.

^{iv} Makdissis, M. and P. Brukner, *Recommendations for lightning protection in sport*, Medical Journal of Australia, Volume 177, 1 July 2002.