

# Photosensitive epilepsy



Epilepsy Action and NHS Tayside –  
working together to support  
people with epilepsy.



This organisation has been certified  
as a producer of reliable health and  
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[www.theinformationstandard.org](http://www.theinformationstandard.org)

Epilepsy Action aims to improve the quality of life and promote the interests of people living with epilepsy.

## Our work...

- We provide information to anyone with an interest in epilepsy.
- We improve the understanding of epilepsy in schools and raise educational standards.
- We work to give people with epilepsy a fair chance of finding and keeping a job.
- We raise standards of care through contact with doctors, nurses, social workers, government and other organisations.
- We promote equality of access to quality care.

Epilepsy Action has local branches in most parts of the UK. Each branch offers support to local people and raises money to help ensure our work can continue.

## Join us...

You can help us in our vital work by becoming a member. All members receive our magazine *Epilepsy Today*, free cover under our unique personal accident insurance scheme and access to our services and conferences.

“ Our vision is to live in a society where everyone understands epilepsy and where attitudes towards the condition are based on fact not fiction ”

*Epilepsy Action, vision statement*

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## Introduction

Photosensitive epilepsy is a type of epilepsy, in which all, or almost all, seizures are triggered by flashing or flickering light. Both natural and artificial light may trigger seizures. Some patterns, like stripes or checks, can also trigger seizures for some people with photosensitive epilepsy. Various types of seizure can be triggered by flashing or flickering light. However, the most common is a tonic-clonic seizure.

In this booklet we look at various things that can trigger seizures in people with photosensitive epilepsy. We also look at ways to minimise the risks.

*Further information on epileptic seizures is available from Epilepsy Action.*

## Acknowledgements

Epilepsy Action would like to thank Professor G F A Harding, Emeritus Professor of Clinical Neurophysiology, Aston University and also Professor Stefano Seri, Professor of Clinical Neurophysiology at Aston University and Consultant at the Birmingham Children's Hospital NHS Foundation Trust for reviewing *Photosensitive epilepsy* before publication.

## About photosensitive epilepsy

- How many people have photosensitive epilepsy?  
Many people think that everybody with epilepsy has photosensitive epilepsy. In fact only five in a hundred people with epilepsy have this type of epilepsy.
- When does photosensitive epilepsy begin?  
Photosensitive epilepsy usually begins before the age of 20. It is most common between the ages of seven and 19. More girls than boys have photosensitive epilepsy.
- Diagnosing photosensitive epilepsy  
When doctors are diagnosing epilepsy, one of the tools they use is an electroencephalogram (EEG). The EEG records brainwave patterns from the tiny electrical signals that are constantly coming from the brain. During one part of the EEG, you are asked to look at flashing lights, to see if this triggers epileptic activity in your brain. If it does, then this may indicate that you have photosensitive epilepsy.

## An explanation of hertz (Hz)

The word hertz (Hz) refers to how often something happens in a second. In this booklet, Hz refers to two different things. It refers to the number of flashes or flickers a second. It also refers to the rate the scanning lines on televisions and computer monitors 'refresh' themselves.

Most people with photosensitive epilepsy are sensitive to 16-25 Hz, although some people may be sensitive to rates as low as 3 Hz and as high as 60 Hz.

## Some possible triggers

### Ceiling fans

Light seen through a fast-rotating ceiling fan could trigger seizures in some people with photosensitive epilepsy. So it's best to get a slow-rotating one if possible.



### Cinema films

In themselves, cinema films, including 3D, don't pose a risk for people with photosensitive epilepsy. However, some films contain images, such as flashing lights, that could trigger a seizure. The Health and Safety Executive's guidelines state that cinemas should warn customers where this is the case. However, there is no guarantee that there will always be a warning. If you are watching a film and something comes on the screen that you think could trigger a seizure, you should immediately cover one eye with the palm of your hand and turn away from the screen.

### Computer monitors

Some people think that people with photosensitive epilepsy are not able to use computers, because they will trigger a seizure. In fact, it's rare for a computer to trigger a seizure.

- Types of computer monitors
  - Cathode ray tube (CRT) monitors  
Cathode ray tube (CRT) screens are the traditional, bulky, computer monitors. CRT computer monitors use scan frequencies ranging from 60 Hz to 100 Hz. As most people with photosensitive epilepsy are sensitive to 16-25 Hz, CRT monitors are unlikely to trigger seizures. This is provided they are set to a refresh rate greater than 70 Hz and are in good working order.
  - Liquid crystal display (LCD) monitors  
Liquid crystal display (LCD) monitors are also known as thin film transistors (TFTs). These are thin, flat, screens and are flicker free. This means they are unlikely to trigger seizures.
- Risk from material displayed on computer monitors  
If material displayed on the screen contains flashing, flickering or some types of patterns, it could trigger a seizure in some people with photosensitive epilepsy. The risk of this type of material triggering a seizure is the same, whether it's on a CRT or an LCD monitor.

Some people are sensitive to patterns with a high contrast, such as black and white stripes. When these high contrast patterns are shown on an LCD monitor, they will be sharper and brighter than on a CRT monitor. This increase in sharpness and brightness may increase the risk to people with photosensitive epilepsy.

- Anti-glare screens  
Glare doesn't usually trigger seizures, although it can make people feel uncomfortable. Anti-glare screens can be put over computer screens. They help to reduce glare, but don't reduce flicker. They are, therefore, of no particular benefit to people with photosensitive epilepsy. We are not aware of any product for people with photosensitive epilepsy that can be put over a computer screen.



## Computer or video games

Most computer or video games are safe to play. Some, however, contain images that could be a risk if you have photosensitive epilepsy. Below are some things you can do to minimise the risk of computer or video games triggering a seizure.

- General advice for anyone with epilepsy playing computer or video games  
Tiredness, or lack of sleep, can increase the risk of a seizure. So:
  - try not to play if you're feeling tired, and
  - take frequent breaks for rest and food between playing games.
- Advice for people with photosensitive epilepsy playing computer or video games on a television
  - Play games in well-lit areas.
  - Have a lamp lit close to the television.
  - Sit at a distance of at least 2.5 metres (8 feet) from the screen.
  - If you have to go near the television, cover one of your eyes with the palm of your hand.
  - You could consider covering one eye with something that won't let the light through. This will cut down the number of brain cells that are stimulated by any flicker on the screen. For most people with photosensitive epilepsy, this will minimise the risk of any flashing or flickering triggering seizures.



- Advice for people with photosensitive epilepsy playing computer or video games on a computer
  - Play games in well-lit areas.
  - If possible, use an LCD/TFT monitor – but remember to reduce the brightness of the screen to reduce the contrast.
  - You could consider covering one eye with something that won't let the light through. This will cut down the number of brain cells that are stimulated by any flicker on the screen. For most people with photosensitive epilepsy, this will minimise the risk of any flashing or flickering triggering seizures.

If your child has photosensitive epilepsy, you could look out for them showing any signs of distress or discomfort when they are playing computer or video games. These signs could be things such as dizziness, blurred vision, loss of awareness or muscle twitching. If this happens, you should immediately stop them playing the game.

### Interactive whiteboards

Interactive whiteboards don't flicker, so are not likely to trigger seizures. However, if material shown on the whiteboard contains flashing, flickering or high contrast patterns, it could trigger a seizure.

## Lights

- Types of lights

- Compact fluorescent lights (CFLs)

There are different types of low energy and energy-saving light bulbs available. Compact fluorescent lights (CFLs) are the most commonly used. New generation CFLs are virtually flicker free, provided they are in good working order. They are, therefore, unlikely to trigger seizures. Some of the older generation CFLs can flicker on start up. However, the very high flicker frequency means they are considered to be no more of a risk than fluorescent strip lights or incandescent bulbs for most people with photosensitive epilepsy.

- Flashing Christmas tree lights

Any flashing Christmas tree lights put up by public organisations, such as local councils, should comply with health and safety regulations. The lights shouldn't, therefore, flash at a rate that could trigger seizures in most people with photosensitive epilepsy. The flash rate of lights sold to the public are not regulated and could flash at any rate. If you come across flashing Christmas tree lights that you feel could be a problem for you, you should immediately cover one eye with the palm of your hand and turn away from the lights.

- Flashing novelty badges

The flash rate of novelty badges is not regulated, which means they could flash at any rate. If you come across flashing novelty badges that you feel could be a problem for you, you should immediately cover one eye with the palm of your hand and turn away from the badge.

- Fluorescent strip lights

Some people find fluorescent strip lights uncomfortable. However, the flicker rate (100 Hz) of fluorescent strip lights



means they shouldn't be a problem for most people with epilepsy. The flicker of a faulty fluorescent strip light, however, could trigger a seizure in people with photosensitive epilepsy.

- Red flashing bicycle lights

Red flashing bicycle lights (light emitting diodes, or LEDs) have triggered seizures in a small number of people. This has happened when they were close to the lights as they were setting them up. If you have photosensitive epilepsy, you may wish to avoid getting close to these types of lights.

- Strobe lights

The flash rate of strobe lights is restricted to a maximum of four flashes a second by the Health and Safety Executive. This rate is considered to be safe for most people. However, some people with photosensitive epilepsy may still find strobe lights could trigger a seizure. If you have photosensitive epilepsy, you may want to avoid places where you could come across strobe lights. Examples are night clubs, discos and theme parks. If strobe lights come on without warning, you should immediately cover one eye with the palm of your hand and turn away from the lights.



## Patterns

Some non-moving high contrast patterns can trigger seizures in some people with photosensitive epilepsy. Examples of non-moving high contrast patterns are black and white stripes, some patterned materials and wallpapers, and sunlight through slatted blinds.

## Sun beds

Using a sun bed shouldn't trigger seizures. If the sun bed lighting flickers, there is the same risk that it can trigger seizures as from a faulty fluorescent tube.

## Sunlight

Being in sunlight is unlikely to trigger a seizure. However, some of the effects it can cause could trigger seizures in people with photosensitive epilepsy. Examples are sunlight shining through the leaves of trees, through railings as you are walking by, or reflected off uneven surfaces, like water.

- Polarised sunglasses

Polarised lenses work by removing reflected horizontal light. Wearing polarised sunglasses out of doors on sunny days can help to minimise the risk of seizures happening. Your optician or retailer should be able to tell you which of the sunglasses they stock have polarised lenses.

## Television

Watching television can trigger seizures if you have photosensitive epilepsy. The nearer you are to the screen the more likely it is to trigger a seizure. Being near the screen will stimulate a larger area of your retina (a light-sensitive part of the eyeball). This will stimulate a larger number of brain cells, increasing the risk of a seizure.

The images shown on the screen can also make seizures more likely. For example, there could be a combination of colour and flicker. Or there could be occasions when there are a lot of press photographers using flash photography, all at the same time.

- Types of television

- Cathode ray tube (CRT) televisions

- Conventional televisions use cathode ray tube (CRT) technology. When you are near the screen, you can see the 25 Hz 'refresh rate' as well as the 50 Hz scan of the screen. This will look like a flickering picture to the human eye. It's common for people with photosensitive epilepsy to be sensitive to 25 Hz, so it makes sense to sit well back from the television to reduce the risk of seizures. Newer CRTs are available that scan the picture at 100 times a second (100 Hz). Televisions of 100 Hz are less likely to trigger seizures in people with photosensitive epilepsy.

- Plasma and liquid crystal display (LCD) televisions

- Plasma and liquid crystal display (LCD) televisions don't use the scanning lines of CRT televisions. Although the risk isn't removed entirely, they are less likely to trigger seizures than CRT televisions. Plasma screens tend to be brighter and have higher contrast than LCD screens. This extra brightness and increased contrast could make seizures more likely for some people with photosensitive epilepsy. If you are choosing between a plasma or LCD television, and you have photosensitive epilepsy, the current advice is to buy an LCD television.



- Safety suggestions when watching television
  - Watch the television in a well-lit room.
  - Have a lamp lit close to the television.
  - Watch the television from a distance of at least 2.5 metres (8 feet).
  - Use the remote control wherever possible – from a safe distance – to adjust the television or to change channels.
  - If you have to go near the television, cover one of your eyes with the palm of your hand. This will cut down the number of brain cells that are stimulated by any flicker on the screen.

### Wind turbines

The flicker frequency of wind turbines on wind farms should be limited to 3 Hz. Newer wind turbines are usually built to operate at a frequency of 1 Hz or less. These flicker rates are unlikely to trigger a seizure.

Not all wind turbines are on wind farms. Those that aren't, are not subject to the same planning regulations as wind farms. If a turbine is in the wrong position in relation to the sun, it could create a strobe effect. This strobe effect could cause a problem for some people with photosensitive epilepsy.

If you have concerns about a planned or existing wind farm, you may wish to contact the British Wind Energy Association (BWEA), who can provide contact details of specific wind farm operators. (See 'Useful information and contacts' opposite.)

## Useful information and contacts

British Wind Energy Association (BWEA) – Greencoat House, Francis Street, London SW1P 1DH Telephone 020 7901 3000; [www.bwea.com](http://www.bwea.com); email [info@bwea.com](mailto:info@bwea.com)

Health and Safety Executive – Helpline 0845 345 0055  
Their guide Disco lights and flicker sensitive epilepsy can be found at [www.hse.gov.uk](http://www.hse.gov.uk)

Office of Communications (Ofcom) – Riverside House, 2a Southwark Bridge Road, London SE1 9HA Telephone 020 7981 3040; [www.ofcom.org.uk](http://www.ofcom.org.uk)

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If you would like to know where we've got our information from, please contact us. Please quote B007.01

Epilepsy Action makes every effort to ensure the accuracy of information in its publications but cannot be held liable for any actions taken based on this information.

## Further information

If you have any questions about epilepsy, please contact the Epilepsy Helpline, freephone 0808 800 5050, email [helpline@epilepsy.org.uk](mailto:helpline@epilepsy.org.uk), text 07797 805 390 or visit our website [www.epilepsy.org.uk](http://www.epilepsy.org.uk)

Epilepsy Action has a wide range of publications about many different aspects of epilepsy. Please contact the Epilepsy Helpline to request your free information catalogue.

Information is available in the following formats: booklets, fact sheets, posters, books, videos, DVDs and CDs.

Information is also available in Braille and large text.

## Epilepsy Action's support services

**Local meetings:** around 100 local branches offer support across England, Northern Ireland and Wales.

**Volunteers:** these are local people (usually with epilepsy or with a family member who has epilepsy) who have been specially trained by Epilepsy Action to give advice on a one-to-one basis. They can also give presentations about epilepsy to groups of people.

**forum4e:** our online community provides an opportunity to contact other people with epilepsy from all over the world, in a safe and secure website: [www.forum4e.com](http://www.forum4e.com) (For ages 16 years and over.)

**Live online advice:** from time to time we run regular advice forums, where trained advisers answer your epilepsy questions live on our website. For more details, visit [www.epilepsy.org.uk/liveadvice](http://www.epilepsy.org.uk/liveadvice)

If you would like more information about any of these services, please contact the Epilepsy Helpline or visit our website.

## Photosensitive epilepsy

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## How to contact us

Telephone the Epilepsy Helpline freephone **0808 800 5050**

Monday to Thursday 9.00 am to 4.30 pm Friday 9.00 am to 4.00 pm

Our helpline staff are Typetalk trained

Write to us free of charge at **FREEPOST LS0995, Leeds, LS19 7YY**

Email us at **helpline@epilepsy.org.uk** or visit our website:

**www.epilepsy.org.uk**

Text your enquiry to **07797 805 390**

## About the Epilepsy Helpline

The helpline is able to offer advice and information in 150 languages.

We provide confidential advice and information to anyone living with epilepsy but we will not tell them what to do. We can give general medical information but cannot offer a medical diagnosis or suggest treatment. We can give general information on legal and welfare benefit issues specifically related to epilepsy. We cannot, however, take up people's cases on their behalf.

Our staff are trained advisers with an extensive knowledge of epilepsy related issues. Where we cannot help directly, we will do our best to provide contact details of another service or organisation better able to help with the query. In doing this, Epilepsy Action is not making a recommendation.

We welcome comments, both positive and negative, about our services.

To ensure the quality of our services we may monitor calls to the helpline.

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## Epilepsy Helpline:

freephone 0808 800 5050 text 07797 805 390

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www.epilepsy.org.uk



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