

What are photosensitive seizures?

In some people, seizures can be triggered by flashing or flickering lights, or by certain geometric shapes or patterns. These are called photosensitive seizures.

This is what we call reflex epilepsy and only seen in about 5% of people with epilepsy. These seizures are more commonly linked with generalised epilepsies than with focal epilepsies, and because they are usually triggered by some sort of visual stimulation, can be reduced with simple avoidance strategies.

Although prognosis is generally very good, photosensitivity and seizures may persist. Medication can help gain adequate seizure control.

How can I tell if I am photosensitive?

Some people only have photosensitive seizures, while others may have other seizure types as well as photosensitive seizures. It is important to have a clear diagnosis, and keep good records or a seizure diary to help differentiate the seizures and their triggers. Photosensitivity can be diagnosed by having a routine EEG with strobe (flickering) light or pattern stimulation.

Today's lifestyle can involve spending many hours using visual technology. While a seizure may occur in these circumstances, it may also be a spontaneous or chance event - so don't conclude your seizures are photosensitive seizures just because you had one or two when using technology.

How is it treated?

In most cases the photosensitive seizures can be well controlled by antiepileptic medication and avoiding known triggers.

What are the triggers?

Typical stimuli in the environment that can trigger epileptic seizures in susceptible people are:

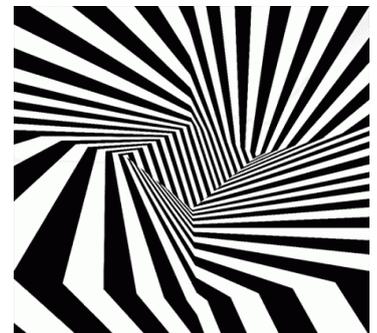
- strobe, flickering or disco lights
- venetian blinds
- striped walls or clothing
- moving escalators
- sunlight reflected off snow, sea or water or interrupted by trees during a ride in a vehicle
- images on the television, computers or electronic games

Less common stimuli are:

- rotating helicopter blades
- dysfunctional fluorescent lights
- welding lights

Whether or not a photosensitive seizure is provoked is influenced by:

- the eyes being open, closed or closing at the time of the stimulation
- the speed of the flashing light(s)
- the contrast and brightness of the stimuli - in general the brighter the stimuli the more likelihood of inducing seizures
- how long the stimulation goes for - a seizure is more likely to occur with longer exposure
- the colour of the flicker (if any) - red flicker is more provocative and colour oscillating from red to blue
- how much field of vision is taken up - close exposure is more likely to trigger seizures



Managing photosensitivity – types of stimuli

The vast increase in modern technologies in society and the increase in their use, particularly of young people, means that there is much more exposure to provocative factors (e.g. large screens, computer screens and strobe lights) than ever before. Avoiding triggers is the best advice. The following precautions only apply to those people who are diagnosed with photosensitive epilepsy.

Television: In the past, this has been of most concern for people who have photosensitive epilepsy, but television has changed and improved with better technology. New television sets with higher refresh frequency rates appear to be less likely to provoke a seizure. A very important factor is the distance between the viewer and the set – the further back a person sits, the less likely the screen will provoke a seizure.

Note: Older-style televisions use cathode ray tube (CRT) technology. When you are very close to the screen, you can see the flicker. It is common for people with photosensitivity to be sensitive to this flicker rate, so sit well back from this television type to reduce the risk of seizures. Newer CRT's now flicker at a much faster rate, almost undetectable by the human eye and outside the most common sensitivity for triggering seizures. Therefore they are much less likely to trigger seizures in people with photosensitivity.

In Australia most people now use Plasma or LCD televisions.

Plasma and Liquid Crystal Display (LCD) televisions do not use the scanning lines of the CRT televisions and therefore don't flicker. The risk of triggering seizures is not completely removed, but is greatly reduced.

Plasma screens tend to be brighter and have more contrast than LCD screens. Contrasting colours could make seizures more likely for some people with photosensitivity.

If you are choosing between a plasma or LCD television, and you have photosensitive epilepsy, the current advice is to buy an LCD television.

Television images: It is more likely the images are what provokes a seizure, such as flashing sequences or rapid changes from light to dark or to contrasting colours, e.g. from red to blue.

Tips:

- Sit at least 2.5m from the television screen in a well-lit room
- Sit at an angle rather than directly in front of the screen
- Place a lamp on or behind the television to reduce the contrast between the screen and the surroundings, even when watching during the day
- Use a remote control or place a hand over one eye to lessen the effect of the flicker when manually changing settings
- Do not watch the screen when fast forwarding, rewinding or adjusting the vertical hold
- In the cinema, try to sit well back from the screen and near a light source, eg in an aisle seat where there is a guiding light
- Look away from any content that makes you feel uncomfortable
- A smaller screen set at low brightness and contrast is preferable.

In daily life, other factors such as sleep deprivation and drug or alcohol use may also play a role in provoking photosensitive seizures.

Electronic games: Usually games are only likely to trigger seizures if there is an underlying tendency to do so – if it has happened to you before. Generally, a seizure is most likely to occur within the first 30 minutes of play. Prolonged play is not a risk unless associated with sleep deprivation – which is a known trigger for seizures. Television screens used as monitors for video games may also trigger photosensitive seizures.

Tips:

- Sit as far away from the screen as possible.
- Play the game in a well-lit room and reduce the brightness of the display.
- Avoid continuous exposure to the same pattern and don't play when overtired.
- Check games for epilepsy or seizure warnings.
- If you do find that a game(s) makes you feel like you are going to have a seizure, then it is best to stop playing and keep exposure to the game in short bursts [have a break every 10-15 minutes].

Computer monitors: It is quite uncommon for a computer screen to trigger a seizure. Only in exceptional cases would it be necessary to restrict computer work. If you are sensitive to screen flicker on older monitors, a screen filter may help. High quality monitors, liquid crystal or LCD screens with a refresh rate of at least 60Hz may not pose a problem. Once again, it is more likely to be the images on the screen that may cause a seizure.

Lights: The frequency of a flashing light most likely to trigger seizures will vary from person to person. Generally it is between 8-30 flashes per second, but this can vary for individuals. Most people seem to be sensitive around 15-20Hz. Ordinary lighting in a room is preferable to fluorescent, but faulty fluorescent lights are rarely the trigger of a seizure.

If you know that disco or strobe lights are likely to trigger your seizures then it is advisable to avoid them.

Fans: Ceiling fans in a lit room can create a flicker effect. A pedestal fan is best if you feel the ceiling fan may trigger a seizure.

Geometric patterns: Some people are sensitive to geometric patterns which have strong contrasts of light and dark eg. stripes or checks. Some buildings and public places may have large areas like this, such as carpet. The average person will just feel some visual distortion, but if you feel strange in this environment, it is important to leave or at least cover one eye.

These patterns may also be on a television or computer screen, or something in the natural environment, such as sunlight through trees, or through venetian blinds. Such contrasting patterns are more likely to be a trigger if they are moving, changing direction or flashing, rather than if they are still.

Camera flashes: These rarely trigger seizures unless fired in rapid succession. It is also rare for seizures to be triggered by hand-held screens.

Red flickering light and strobe/disco lights: These can trigger seizures, particularly if the room is darkened and there are other triggers such as stress, excitement, tiredness, sleep deprivation and alcohol. For those who are photosensitive, the risk will greatly depend on the speed of the flashing light.

It is sensible to avoid discos if you have photosensitive epilepsy, but this is a common social activity for young people, so it may be a hard one to resist. Some people do attend discos even if they are photosensitive, and find they can tolerate it. Responsible clubs and DJs may display warnings if these lights are used and retail employers may turn off flashing lights in their store if requested.

It is advisable to have no more than 2 hours screen time a day.

Sunlight: This can trigger seizures in a number of ways such as: the reflection of light flickering off water or through leaves of trees, and light flickering through posts or railings when moving quickly, e.g. travelling in a car. Cover one eye with the hand to lessen the effect of the flicker as binocular (looking through both eyes) vision is needed to trigger a seizure. Polaroid sunglasses with shaded sides may also help reduce the risk.

Photosensitive facts and hints

Photosensitive seizures can be triggered in many ways and not all of the triggers are included here, and not all of the hints may apply to everyone. It is best to work out what situations or technology affect you and avoid them if you can.

- Seek expert diagnosis. Do not assume you are photosensitive as you may be placing unnecessary constraints on your lifestyle
- Avoid known stimuli that may trigger your seizures
- 96% of people with photosensitivity are sensitive to flickering between 15-20Hz/flashes per second
- Wear polarised sunglasses to reduce glare. Coloured lenses work for some people - blue lenses appear to be the most effective
- When watching television, or using computers and electronic games, always ensure a room light is on so there is less contrast between the screen light and the room light
- If possible, reduce the brightness of the screen
- Use a television remote control when watching television
- Cover one eye to reduce the effects of flashing or flickering light
- Most computer monitors do not present a problem
- Seizures triggered by electronic games are most likely to occur within 30 minutes of play
- Keep 2.5m from the television or electronic game screen and 30cm from a computer monitor
- Take frequent breaks from electronic games and look away from a computer/television screen regularly
- Camera flashes rarely trigger seizures unless fired in rapid succession
- Tiredness can be a factor so try to avoid stress, extreme fatigue or sleep deprivation
- Avoid excessive consumption of alcohol
- If you feel strange or think you may have a seizure, immediately turn off the game/computer or television or look away
- There is evidence that photosensitive seizures are inherited
- In most cases seizures can be controlled with regular medication.



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