# Light sensitivity (photophobia)

Good lighting can help you make the most of your sight, particularly if you have an eye condition that is affecting your vision. However, for some people, everyday lighting conditions can seem too bright, causing them discomfort and this can even affect their quality of vision. Light sensitivity, also known as photophobia, often affects people who have an underlying eye condition.

## Light and the eye

### Where does light come from?

The light we need for vision comes from different sources, such as daylight from the sun, lamps, car headlights and computer screens. Light can enter our eyes directly, for example, from a computer screen, or daylight outside, but we also see using light that’s reflected back to our eyes from the objects around us. Objects reflect and absorb light to different extents, allowing us to see things that don’t produce light themselves, such as a mug on a table or flowers in a garden. Reflected light also allows us to see an object’s colour as well as how bright the object appears to be.

### How the eye works

Light is needed for us to see. First, light passes through the watery layer covering the front surface of the eye, known as the tear film. Then it passes through the clear cornea at the front of the eye, through the pupil (the hole in the middle of the coloured iris), and through the lens inside the eye. The main role of the cornea and lens is to bend light to focus it accurately on to the retina at the back of the eye. Light then passes through the clear vitreous gel to reach the retina at the back of your eye.

The retina is made up of light sensitive cells, called photoreceptors. These cells convert light into electrical impulses which then travel along the optic nerve to our brain. Our brain processes these impulses so that we can "see” the world around us. When we look directly at something, we see it using the central part of the retina known as the macula. The macula is very important for seeing detail and colour.

The following diagram shows a cross section of the eye. From the front to the back of the eye, it is labelled cornea, pupil, iris, lens, vitreous gel, retina, macula, fovea, and optic nerve.



## What causes light sensitivity?

Light sensitivity is often worse when you have an eye condition. This might be because there is inflammation (swelling) affecting part of your eye. There are some eye conditions that cause your eye to adapt more slowly to changing light levels, and this can make you more light sensitive in these situations. Your eye condition may cause changes that mean light is scattered inside your eye instead of reaching the macula as it should. This light scatter causes glare which can increase your sensitivity to light. Glare is described in more detail later in this factsheet.

Almost any eye condition can cause some degree of light sensitivity. This may make you feel more sensitive to light most of the time or only in certain situations. Some eye conditions that can cause light sensitivity involve changes to the following parts of the eye:

### The cornea and lens

If an eye condition affects the regular shape or clarity of these structures, light passing through them will be scattered, reducing the quality of your vision. Examples include:

* corneal dystrophies - which can cause changes in the clarity of the cornea
* keratitis - an inflamed cornea
* keratoconus - where there are changes in corneal shape, strength and thickness
* cataract – a cloudy natural lens
* posterior capsular opacification (PCO) – this causes cloudy vision to develop after a cataract has been removed

You can find more information about corneal dystrophies, keratoconus, cataract and PCO on our website **rnib.org.uk/your-eyes/eye-conditions-az** or by calling our Helpline and requesting our information about these conditions.

### The iris

The iris is the coloured part of your eye and it controls the amount of light entering it. Some conditions affecting the iris include:

* anterior uveitis - inflammation of the iris
* aniridia - the iris is missing or underdeveloped from birth
* iris coloboma - the lower portion of the iris is missing from birth

You can find more information about uveitis, aniridia and coloboma on our website **rnib.org.uk/your-eyes/eye-conditions-az** or by calling our Helpline and requesting our information about these conditions.

### The retina

There are many eye conditions affecting the retina which can lead to light sensitivity. Some of these include:

* Age-related macular degeneration (AMD) - there are changes to the cells of the macula in the central retina
* Glaucoma - the pressure inside the eye is too high, causing damage to the optic nerve at the back of the eye
* Inherited retinal dystrophies (IRDs) - genetic conditions, such as retinitis pigmentosa (RP), which affect the photoreceptor cells of the retina
* Albinism - a genetic condition where the eye has only a little or none of the pigment melanin, so that light is scattered inside the eye

You can find more information about AMD, glaucoma and IRDs including RP on our website **rnib.org.uk/your-eyes/eye-conditions-az** or by calling our Helpline and requesting our information about these conditions.

You can find out more information about albinism by contacting the Albinism Fellowship. Their details can be found at the end of this information.

## What is glare?

We need light to be able to see but many people with low vision need more light than usual to carry out certain tasks, such as reading. However, sometimes the lighting around us interferes with our vision. When lighting makes it uncomfortable for you to see or makes your vision worse, it’s known as glare.

Glare can be a problem if a light is too bright for you, it’s coming from the wrong source, or it isn’t in the right place.

There are two types of glare that can cause problems - discomfort glare and disability glare. For some people, both can be present at the same time in certain circumstances.

### What is discomfort glare?

Discomfort glare occurs when a light source is too strong for your eyes. It may cause you to “screw up”, shade or even close your eyes because the light level makes you feel uncomfortable. When trying to see in these bright conditions, however, discomfort glare doesn’t usually make your vision less clear than it was before.

A good example of when we might experience discomfort glare is moving from a dark room into bright sunlight. As our eyes adjust to the brighter level of light, it can sometimes feel uncomfortable. Usually, within a few seconds, our eyes adapt to the new level of light, and our initial discomfort goes away. As we get older, our eyes naturally adapt more slowly to varying light levels, meaning it can take longer than it did before to make these adaptations. However, some eye conditions can affect the speed of these adaptations, leading to greater problems with discomfort glare in some situations.

Discomfort glare can also be reduced if the lighting around you closely matches the lighting of your task. For example, a computer screen will be more comfortable to look at if it is viewed in a room that is lit to around the same brightness as the screen. Viewing the same screen in a dark room will lead to greater levels of discomfort glare.

### What is disability glare?

Disability glare occurs when a light source reduces how well you can see, and the brighter the light is, the more glare it can cause. Some eye conditions cause disability glare, not only in bright lighting, but with everyday lighting as well.

Disability glare doesn’t necessarily cause discomfort, but it can reduce how much detail you can see. This type of glare generally reduces contrast, so that objects aren’t as easy to see against their background. If glare is very intense it can greatly reduce your vision, causing “dazzle”.

Disability glare is worse when:

* there is a greater amount of light scatter. This may be caused by an eye condition or by other factors, such as a dirty car windscreen.
* the glare source is brighter than the surrounding light; for example, car headlights cause more glare at night than in the day.
* the glare source is more in your line of sight; for example, the sun causes greater disability glare when it is lower in the sky, such as at sunrise or sunset.

A common eye condition which causes disability glare is cataract. The clouding of the eye’s natural lens means that light passing through it is scattered inside the eye. For example, the glare from oncoming headlights when travelling at night, often makes it harder for a person with cataract to see.

## What should I do if I have light sensitivity and glare?

It’s important to see an optometrist (optician) if you are sensitive to light, so they can examine your eyes. An optometrist will be able to check the health of your eyes and look for any underlying eye condition which could be causing your light sensitivity or issues with glare.

If you suddenly become sensitive to light or your light sensitivity worsens, you should have your eyes checked as soon as possible, as it can indicate that an eye condition has become worse or that a new condition has developed. Much less commonly, more severe light sensitivity that starts very quickly can be the first sign of a serious condition, such as meningitis. If you are in any doubt, it is always best to have any new symptoms checked by a doctor or optometrist.

## Are there other causes of light sensitivity?

### Medication

Some medications can have light sensitivity as a side-effect. Examples of these include non-steroidal anti-inflammatory drugs (NSAIDs), antibiotics, acne medication and diuretic drugs used to treat high blood pressure.

### Migraine

People who suffer from migraine tend to be more sensitive to light, particularly during a migraine headache. Sometimes, certain types of light or light patterns can trigger migraine. More information about migraines can be found on the Migraine Trust website and their details can be found at the end of this factsheet.

### General health conditions

Other general health conditions can also increase a person’s sensitivity to light. Examples include:

* blepharospasm (muscle spasms in the eyelids)
* progressive supranuclear palsy (PSP)
* fibromyalgia
* stroke
* traumatic brain injury

The reasons why these conditions are associated with light sensitivity isn’t fully understood because the sensitivity to light seems to come from the processing areas of the brain, and not from the eyes. However, reducing the amount of light entering the eye as described in this factsheet, can still help to relieve the symptoms of light sensitivity for these conditions.

## Can I have light sensitivity without a medical cause?

Everyone experiences some degree of light sensitivity at times, especially in very bright, sunny conditions and this is normal. It’s also true that light sensitivity affects people to different extents; some people are naturally more sensitive to light than others. This might be related to their iris colour, as iris pigment helps to block excess light from entering the eye. This means someone with a lighter coloured iris, for example blue eyes, might be more sensitive to light than someone with a darker iris.

However, some people are more light sensitive without having any underlying medical cause, and typically, their light sensitivity will be longstanding. When someone is sensitive to light with no underlying cause, this can still be managed in the same ways as light sensitivity relating to an eye condition.

## Can light sensitivity or glare be treated?

If your light sensitivity is being caused by an underlying eye condition, your symptoms can improve if the eye condition can be treated; for example, removing a cataract or treating inflammation.

Unfortunately, not all eye conditions can be treated, but there are still things that can help you cope better with any light sensitivity and glare they cause.

## How can I manage light sensitivity and glare?

The best way to manage light sensitivity and glare is to limit the amount of light entering your eyes. This can be done by shading them with your hand, wearing a baseball cap or a wide brimmed hat, or shading beneath an umbrella or parasol. Wearing sunglasses or tinted eye shields is often helpful too, and your optometrist or low vision specialist will be able to advise you further about the lens types that may work best for you.

### Sunglasses

#### Tinted lenses

Tinted lenses reduce the amount of light that enters your eyes which can help with light sensitivity. This reduction of light does not harm your eyes or make them lazy.

Tinted lenses come in a variety of colours and can be light or dark. It’s a personal choice as to what colour and how light or dark your lenses are. It’s important to remember that as well as helping your light sensitivity, the lenses you choose need to allow enough light through them for you to be able to see the best you can. This means that if you have light sensitivity and an eye condition that has led to sight loss, it’s probably best not to choose a tint that is too dark, as this might make your overall vision worse.

#### Photochromic lenses

Some people find light activated lenses are helpful. These are known as “photochromic” lenses, and they get darker in brighter conditions. All photochromic lenses darken when they’re exposed to ultraviolet (UV) light becoming darker when you’re outside. Some photochromatic lenses react to visible light as well as UV, meaning they react when behind glass, such as in the car.

#### Polarised lenses

Polarised lenses are sunglasses that are specially designed to reduce the glare produced when surfaces reflect too much light into the eye. Examples of these include water, such as the surface of the sea, a lake or a wet road. Snow covered ground and metal surfaces such as the car bonnet can also cause glare. If you find reflected glare is a problem for you, polarised lenses can be helpful.

#### Sunglasses and ultraviolet (UV) light

It’s important to protect your eyes from harmful UV light contained in sunlight, whether or not you have an underlying eye condition. All sunglasses should have an UV filter. A darker lens doesn’t mean it will provide more UV protection. Make sure your sunglasses have a CE or British Standard (BS EN ISO 12312-1) mark to show that they offer proper UV protection. Clear prescription glasses and many contact lenses now normally have some UV filtering included as standard. Speak to your optometrist about how to protect your eyes further.

#### Sunglasses and driving

If you drive, it is important to get advice from your optometrist on the level of tint to wear when you’re driving. This is important as your lenses need to let in enough light to drive safely and meet DVLA regulations. The Highway Code warns against using any form of tint for night driving, as they restrict sight in the dark.

### Eye shields and wrap-around shades

Eye shields are larger than normal sunglasses. They have built-in sides which stop the light entering from above, below and to the sides of the lens. Some can also be worn over your everyday glasses. These can be helpful if you are very light sensitive but need to wear a glasses prescription to see more clearly.

Wrap-around shades have a close-fitting style to keep light from entering around the frame, and this means they wouldn’t fit over your everyday glasses. However, it might be possible for your prescription to be included in a wrap-around frame and you can ask your optometrist about this.

The fit of your eye shields and wrap-around frames is very important. Everyone has a different face and head shape, so it’s useful to try on several pairs of frames to find the ones which fit you best to relieve your light sensitivity. Your optometrist or dispensing optician can help you with this.

### What colour tint is best for me?

When choosing which tint to wear in your sunglasses or eye shields, there are several options to choose from in terms of the tint colour and how dark it is. Different coloured tints limit different wavelengths of light from passing through them, so some people find one tint is more effective than another in managing their light sensitivity.

To find the best tint that helps reduce your symptoms, it’s a good idea to try some different options for yourself. If possible, trying different tints in the various situations that cause light sensitivity can help you make your choice. For example, you may find you need a different tint when indoors compared to being outdoors. Your optometrist or low vision service should be able to advise you more about your options. More information on the low vision service can be found further on in this factsheet.

There is no strong evidence to suggest that a particular shade of tint will always help to relieve light sensitivity caused by a specific eye condition. For example, two people with macular degeneration may prefer two completely different coloured tints to relieve their light sensitivity. However, where an eye condition such as cataract, causes glare by scattering light inside the eye, yellow and amber tints are often helpful. This is because they block out the shorter wavelengths of visible light (blue light), which are more easily scattered inside the eye.

### Managing changes in lighting

It’s advisable to use the lightest tint that relieves your symptoms while you’re inside, so that you have darker tint options for when you’re in brighter conditions outside. This can help you to adapt better when moving from one environment to another where light levels can be different.

For some people, their eye condition can cause difficulties when moving between one level of lighting to another; for example, when moving from a dim room into sunlight, or vice versa. It may be necessary to pause and put sunglasses on or take them off to give your eyes the opportunity to adjust. It’s important that you don’t feel rushed and that you give yourself time. This is especially important where glare could affect your safety, such as navigating steps at the entrance to buildings where significant changes in lighting can be present.

### Indoor lighting

If you have an eye condition that affects your sight, you may find that using a task light for activities such as reading allows you to see much better. Using an adjustable lamp allows you to direct light to where you need it the most. The best position for an adjustable lamp is below your eye level, between you and the task you’re doing, so that you can direct the light source at what you want to look at. Using an adjustable lamp in this way can reduce the amount of glare you experience when doing close work.

If you are using a lit device such as computer, tablet or phone, you may find it more comfortable to view them in ‘dark mode’, where white text is viewed on a black background. This can be more comfortable than viewing black text on a white background. If you are reading text such as in a book, magazine or newspaper, you may find using a typoscope helps. A typoscope is a black plastic reading guide which has a cut-out section to allow you to read a small amount of text at a time. Using a typoscope or ‘dark mode’ on a device reduces the glare that can come from looking at the entire page or white screen.

Many people also find that making some adjustments to lighting in the home may help. Using shades, dimmer switches and blinds can help with glare and allow you to change the direction of light in a room. Changing your positioning in relation to a window can also help with glare and light sensitivity. You might also find it helpful to keep the light level consistent throughout your home to avoid bright and dark areas that can cause difficulties when moving from one light level to another.

The Thomas Pocklington Trust website has more information about lighting in and around the home which can help people who are visually impaired, and their details are listed at the end of this factsheet.

## Where can I get advice about tints or eye shields?

### The optometrist and dispensing optician

You can speak to an optometrist or dispensing optician at your local optician’s practice for more advice about the different lens options available which can help with light sensitivity and glare. Dispensing opticians and optometrists are qualified in dispensing different lenses and fitting glasses, and they can give professional advice about different lens types and frames that are suitable for both adults and children.

### The low vision clinic

If you have sight loss, your ophthalmologist (hospital eye doctor), optometrist or GP can refer you to your local low vision clinic for a low vision assessment. A low vision specialist looks at ways to help adults and children with sight loss make the most of their vision, including advice on coping with light sensitivity and glare. They can help you explore different types of eye shields to see which one may help with your symptoms.

The low vision specialist can also talk to you about the best way to use lighting to make the most of your sight, whilst minimising glare as much as possible.

### A local sight loss society resource centre

You can also try out a range of eye shields, as well as other equipment to help with daily living, at your local sight loss society resource centre. You can search for your local sight loss society or low vision service via our Sightline directory www.rnib.org.uk/sightline-directory

You can find more information about lighting and low vision by calling our Helpline and requesting our booklet entitled ‘Making the most of your sight'. You can also look at the range of eye shields we have on our RNIB shop at **shop.rnib.org.uk/health-and-mobility/eyewear**

## Sources of support

### RNIB Helpline

If you need someone who understands sight loss, call our Helpline on **0303 123 9999**, say "**Alexa, call RNIB Helpline**" to an Alexa-enabled device, or email **helpline@rnib.org.uk**. Our opening hours are weekdays from 8am-8pm and Saturdays from 9am – 1pm

You can also get in touch by post or by visiting our website:

**RNIB**

Grimaldi Building

154a Pentonville Rd

London N1 9JE

**rnib.org.uk**

### Sight Advice FAQ

Ask the Sight Advice FAQ website your questions about sight loss and get helpful answers: **sightadvicefaq.org.uk**

### Connect with others

You can meet or connect with others who are blind or partially sighted online, by phone or in your community to share interests, experiences and support for each other. From book clubs and social groups to sport and volunteering, our friendly, helpful and knowledgeable team can link you up with opportunities to suit you. Visit **rnib.org.uk/connect** or call our Helpline.

### Other useful organisations

**Thomas Pocklington Trust**

Tel: **0208 995 0880**

Web: **pocklington-trust.org.uk**

Email: **info@pocklington-trust.org.uk**

The Thomas Pocklington Trust lighting guide for people with visual impairment can be accessed via their website.

**Migraine Trust**

Tel: **0808 802 0066** (Mon-Fri, 10am-4pm)Web: **migrainetrust.org**

**Albinism Fellowship**

Tel: **07946 457979** (voicemail and call back service)

Email: **info@albinism.org.uk**

Web: **albinism.org.uk**

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Send your comments to us by emailing us at **eyehealth@rnib.org.uk** or by writing to the Eye Health Information Service, RNIB, Grimaldi Building,154a Pentonville Road, London N1 9JE.

## Information sources

This factsheet has been written by the RNIB Eye Health Information service. Our factsheets have been produced with the assistance of patient and carer input and up-to-date reliable sources of evidence. The accuracy of medical information has been checked by medical specialists. If you would like a list of references for any of our factsheets, please contact us at **eyehealth@rnib.org.uk**.

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