# Stroke-related eye conditions

## What is a stroke?

Stroke or cerebrovascular accident (CVA) is a very common cause of adult disability. In the UK there are more than 100,000 stroke incidents each year and about two thirds of stroke survivors usually have some form of disability. You’re more likely to suffer a stroke if you are over the age of 55, but it can happen to anyone at any age. One quarter of stroke survivors are of working age.

Strokes occur when a part of your brain is starved of oxygen and nutrients. Oxygen and nutrients travel in your blood to all parts of the body including the brain. The two common causes of stroke are blood clots (ischaemic stroke) and bleeding (haemorrhagic stroke). A blood clot prevents oxygen and nutrients from being delivered to a part of your brain and is the more common cause of stroke. Haemorrhagic stroke can occur where a part of your blood vessel wall is weakened causing it to burst and bleed into the brain. This causes damage of nearby brain cells due to lack of oxygen and nutrients.

A ‘mini’ stroke or TIA (transient ischaemic attack) can happen if there is a temporary blockage of blood supply to the brain. However, the blockage in TIA only happens for a short period of time before the blood supply returns to normal. TIAs could be an early warning sign that someone is at risk of a major stroke. Although this is less true if the TIA only affects the eye, a condition called amaurosis fugax.

Stroke can affect you in many different ways, and the symptoms and degree of damage caused varies from person to person. Some of the common effects of stroke include problems with walking, speech and language, mental processing, swallowing, paralysis and vision. Some people are mildly affected by the stroke in the short-term, while others may suffer more long-term disabilities from their stroke.

## How can a stroke affect vision?

Vision problems following a stroke are quite common. The effects of a stroke on vision depend on what part of your brain is affected or starved of oxygen and nutrients. As seeing involves not only your eyes but the brain as well, stroke-related vision problems can be very complex to understand and treat.

Our eyes send visual information to different parts of the brain involved in seeing. This is known as the visual pathway. If a stroke affects certain parts of the visual pathway or parts of the brain that are involved in processing and interpreting visual information, then this can affect your sight. The main types of eye problems that can occur after a stroke include visual field loss, eye movement problems and visual processing problems.

If you experience TIA and the blockage of blood supply involves the eye you may experience temporary loss of vision in one eye. If vision areas of the brain are involved, you may have problems like double vision or difficulty seeing on one side. However, as the blockage is usually for a short duration, the blood supply returns to normal and your symptoms disappear. Symptoms of TIA generally last between a few minutes and 2 hours, but sometimes may persist for up to 24 hours. As TIA can often be an early warning sign of someone at risk of a stroke, it's important to seek urgent medical attention by contacting the general practitioner (GP) or visiting the nearest Accident and Emergency Department (A&E).

## What are some of the common visual symptoms of stroke?

Stroke can affect the visual pathways of your eye and this can impact your vision in different ways that may include:

* visual field loss
* blurry vision
* double vision
* reading difficulty
* moving images
* other problems such as dry eye and sensitivity to light.

When stroke affects the areas of your brain that process information of what you see, it can cause problems such as:

* visual neglect
* judging depth and movements
* recognising objects and people
* visual hallucinations.

## How can vision problems following a stroke be managed?

The main focus following a stroke is on rehabilitation. Part of the rehabilitation programme for someone who has had a stroke normally includes an assessment of their vision and eyes. Orthoptists and low vision specialists can assess and work with you on visual training with or without optical aids. The stroke team, GP or ophthalmologist (hospital eye doctor) can refer you for an orthoptic assessment and/or to the low vision clinic.

There are different techniques that can be used to try to help deal with the visual effects of stroke. These will depend on how the stroke has affected your vision but can include glasses, prisms on glasses, patching, magnifiers and visual scanning techniques. There are also computer-based rehabilitation programmes which may help improve your ability to scan if you have visual field loss.

Some people may see some improvement in their vision for many months following a stroke, more commonly after an ischaemic stroke. However, this is very individual and really depends on where in your brain the damage has occurred, the extent of the damage and the type of stroke you have had, as well as any other existing health problems. Unfortunately for many people, especially those with visual field loss, sight loss may be permanent.

### Visual field loss

A common problem that can affect your sight after a stroke is loss of part or whole sections of your visual field. Visual field is the term used to describe the entire area that you can see when your eyes are fixed in one position. It refers to everything you can see in the periphery (side) of your vision as well as what you can see looking directly at something (central vision).

Stroke can affect your central vision, but the degree of central vision loss can vary from person to person and is usually not severe.

Your visual field loss can affect your ability to see objects at the sides, away from your central line of sight. As nerves from each eye travel together in the brain, visual field loss usually affects both eyes. However, the type of visual field loss will depend directly on the area of your brain affected by stroke. The occipital cortex at the back of the brain is generally a common area to be affected in stroke. Damage to the occipital cortex can cause you to lose half of your visual field from each eye (hemianopia). Other visual problems may include blank patches (scotoma) in your vision, or a quarter of your visual field lost in both eyes (quadrantanopia). Unfortunately, any missing area of your visual field due to stroke can’t be restored or repaired.

#### Hemianopia

Hemianopia is where there is a loss of one half of your visual field. This may mean that you’re not able to see to either the left or right from the centre of your field of vision in both eyes. If you have a stroke to one side of your brain, you may develop field loss to the opposite side. For example, if the right side of your brain has been affected by the stroke, the left side vision in each eye may be affected.

When hemianopia occurs in the right half of the visual field equally in each eye, it’s called right homonymous hemianopia and if it occurs in the left half of the visual field in each eye, it’s called left homonymous hemianopia.



**Left homonymous hemianopia** – this picture gives a rough idea of what a person with left hemianopia may see. However, a photo isn’t able to show exactly what the person sees.

Although hemianopia does not affect all of your vision, it can still cause problems with day to day living such as locating things, coping with traffic on the street, or being disoriented in crowded environments such as supermarkets.

Reading can also be a very frustrating experience with hemianopia as words and sentences disappear when in the missing visual field. If you have right hemianopia, you will find it difficult to move your eyes in order to read from left to right. Sometimes using a marker at the end of the sentence or a post-it note to indicate where the end of the line is can be helpful. A typoscope (a piece of card with a rectangle box cut out) or a bar magnifier (a long thin magnifier with a guideline on it) can be helpful by making it easier to focus on a line of text at a time. If you have left hemianopia, then you may have difficulty finding the beginning of the sentence and finding the next line of text. Once again, using a post-it note or ruler to mark the beginning of the text and underneath text can be helpful. It may also be helpful to tilt the text and read it vertically.

Sometimes with hemianopia you may not be aware that you’re unable to see from a part of your visual field. You can be taught scanning techniques (eye movement patterns) in the direction of the hemianopia in order to compensate.

Scanning exercises are easy to do and can be done in different ways. You can practice scanning by keeping your head still and moving your eyes around the room to your affected side of vision. You could also use puzzles and word search games in books or on computers and tablet screens to improve your visual perception and visual-tracking skills. There are free scanning training programmes on the internet which can be helpful:

* Eye-Search: [**www.eyesearch.ucl.ac.uk**](http://www.eyesearch.ucl.ac.uk)
* Read-Right: [**www.readright.ucl.ac.uk**](http://www.readright.ucl.ac.uk)
* Durham Reading and Exploration Training: [**www.durham.ac.uk/departments/academic/psychology/research/services/drex/**](http://www.durham.ac.uk/departments/academic/psychology/research/services/drex/)

These computer-based scanning programmes will not help you recover any visual field loss but can help you get the most out of your remaining field of vision. Scanning exercises have been shown to be beneficial as a treatment to improve your speed and accuracy in finding objects on your affected side.

Optical aids may also be used to help increase your field of view and must be fitted by an eye care professional. This may be in the form of prisms which can either be temporary or permanent and usually applied on glasses on the affected side.

Prisms don’t change the focus or prescription of the lens but can shift an image (prismatic effect) either to the right, left, above, below or diagonally as needed. Training with prisms can include learning to scan and to make sure any related safety issues are addressed while you’re using them. Many people experience headaches and confused visual images with prisms for hemianopia, so care must be taken when using them. With the appropriate training, prisms may help you with day to day living including moving around obstacles better while walking.

Other optical aids that may be used include small mirrors that can be attached to spectacles (hemianopic spectacles). Another type of aid used is the Peli lens that takes advantage of a prism to alter the direction of light from objects entering the eye. Peli lens can be used to expand the visual field in someone with field loss due to hemianopia, helping with mobility and avoiding bumping into things around. An inverted telescope can also increase your visual field, but it does require you to have good central vision.

There are other newer electronic devices that can be used to increase the field of vision if you have field loss as a result of hemianopia. A lot of research and development is being carried out in this field and there are more and more new improved products made available for use. Further information on products and technology can be found on our website - **rnib.org.uk/technology** or by calling our Helpline on 0303 123 9999 who can then connect you to our Technology for Life team to explore options further.

None of the techniques and devices can help to bring back any visual field that you’ve lost but may help you get the most out of the field of vision you have. They don’t work for everyone and training is needed to make sure you can use them safely and comfortably.

### Eye movement problems

Damage to the nerves that control your eyes can lead to eye movement problems after a stroke which can result in both your eyes not working together as a pair. This can make it difficult to maintain stable focus on things because of blurred vision as well as double vision (diplopia). Double vision is where you see two images of the same object one on top of the other or side by side or a combination of both. This can cause problems with reading, walking and performing everyday activities.

You may also experience weakness in your eye muscles, like difficulty or even inability to follow objects with your eyes (pursuit) or shift vision quickly from object to object (saccade) which may make it difficult for you to focus or track objects. In addition, your eyes may wobble (a condition known as nystagmus) or you may not be able to move both eyes together in a particular direction (gaze palsy). It may be difficult to move your eyes up and down, or one eye may move when the other fails. Sometimes nerves that control individual eye muscles stop working, leading to a condition called squint (strabismus) where your eye is turned. You can find further information on nystagmus on our website - **www.rnib.org.uk/eyehealth** or by calling our Helpline on 0303 123 9999.

Treatment can involve prisms and occlusion or patching. Prisms for eye movement problems are used to help eliminate double vision and are very effective when the size of the double vision does not change significantly as you look around. In the initial stages following a stroke, the double vision may change and therefore, a temporary prism may be recommended for use by your orthoptist.

The prism is known as a Fresnel prism and looks like a thin, transparent plastic sheet that can be stuck to the surface of your spectacles, allowing the direction of light to be changed from objects entering your eye as needed. One side consists of a series of angular grooves (prisms) and the other smooth side attaches to the lens of your glasses. The temporary Fresnel prism is applied to your spectacles making sure that it’s positioned correctly.

How long a Fresnel prism is required will vary from person to person. Sometimes it is needed for several months, but the strength of it may change. If so, the Fresnel prism can be removed from your glasses lens and a new one of a different strength put on. Once the double vision and strength of prism needed becomes stable, the Fresnel prism can be replaced with a permanent prism incorporated into the glasses lens itself.

Occluding one eye fully or partially can also be an effective solution for double vision. If your eye is fully occluded, it will mean that you will have monocular vision, that is, having vision in one eye only. Usually occlusion is done by applying a frosting sticker to one lens of your glasses.

Being monocular can also cause problems with reduced 3D vision or depth perception leading to mobility issues due to reduced field of vision. For example, judging how high a step is or how far away something is can be difficult. There are ways to try to cope with some of these difficulties such as using a cane to help with judging steps and kerbs or feeling for the table before you place a cup on it, etc. You may, however, need to take more time when doing these things. You can find further information on monocular vision on our website - **www.rnib.org.uk/eyehealth** or by calling our Helpline on 0303 123 9999.

Occlusion doesn’t have to cover the entire lens. Sometimes it’s possible to cover only a part of your lens in the line of sight that is causing your double vision. This form of patching will not result in you being monocular and therefore you may not encounter as many problems with navigation and mobility.

### Visual neglect

After a stroke, you may have difficulty with visual processing or your ability to make sense of what you see. The most common visual processing problem after a stroke is visual neglect, also known as spatial inattention, which can affect your perception of things around you as you may be unaware of objects to one side. Visual neglect is more common when you have a stroke in the right side of the brain which affects the left side of the body. It may occur when you have visual field loss but can occur on its own as well.

You may even be unaware of one entire side of your body. If you experience neglect, then you may ignore food on one half of your plate, avoid shaving or applying make-up to one side of your face as well as be unaware of objects and people that are on your affected side causing you to ignore or bump into objects that are on that side.

Treatment for neglect can include prisms, but most often you’re advised on using scanning and awareness strategies to help you cope with the neglect. Unfortunately, if you have both visual field loss and neglect, you’re less likely to respond to scanning techniques or compensate for the problem.

### Visual hallucinations

Some people who have lost some sight following a stroke may start to see things that are not really there known as visual hallucinations, commonly known as Charles Bonnet syndrome (CBS). This is a common condition among people who have lost a lot of sight and causes people to have visual hallucinations. The main cause of CBS is loss of vision and the way your brain reacts to this loss.

The things that people with CBS see can range from simple patterns, shapes or colours to detailed pictures of people, animals, insects, landscapes and buildings. With CBS, the hallucinations only affect your sight which means that you don’t hear, smell or feel things that aren’t there.

CBS can be distressing, but many people find that the hallucinations can get less frequent with time. It was initially thought that hallucinations resolved within 12 to 18 months, but a recent study found that some people still have occasional hallucinations five years after they first started experiencing them

You can find more information about CBS in our ‘Understanding Charles Bonnet syndrome’ booklet on our website - [**www.rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline on 0303 123 9999.

## What other problems can stroke cause to your eyes?

Other problems that can affect your eyes or vision after a stroke include increased sensitivity to light, dry eye, visual balance disorders and processing problems.

Sensitivity to light can occur when the brain seems to have difficulty adjusting to different levels of light. You might notice that bright lights are uncomfortable. Tinted glasses or specially designed eye shields can help in easing the discomfort you might have. Some people find it is easier to read when placing a yellow transparent plastic sheet over their reading material as this reduces glare. You can find more information about ‘Light sensitivity (photophobia)’ on our website - [**www.rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline on 0303 123 9999.

Dry eye following a stroke can be due to problems with the nerves of the eyelid, the facial nerve or the muscles of the eyelid. The rate that you blink may be slower following a stroke and/or you may not be able to close your eyelids completely. If you’re not able to blink or close your eyes completely, it can cause a part of your cornea, the clear front surface of your eye, to dry out causing your eye to feel gritty and uncomfortable. Using artificial tear eyedrops to keep your cornea lubricated, using ointment when sleeping, and reminding yourself to try to blink often and completely, may help you to manage dry eye. You can find more information about dry eye on our website - [**www.rnib.org.uk/eyehealth**](http://www.rnib.org.uk/eyehealth) or by calling our Helpline on 0303 123 9999.

Problems due to the nerves supplying the eye can cause an eyelid to droop (ptosis). This can cover your pupil (the hole in the coloured part of your eye known as the iris) affecting your line of sight. The pupil can also become bigger.

Often a person after a stroke may be able to read text readily but is unable to make sense of the text. They may attribute this to not being able to see the text properly when it’s actually due to failure of processing the information that they’ve read. Some people may have ‘visual agnosia’ where they are able to see objects or people but have trouble in recognising them. These difficulties are not related to vision itself but a result of damage to parts of the brain that perceive and interpret what you see.

## Can I still drive?

The Driver and Vehicle Licensing Authority (DVLA) have strict guidance about driving with a medical condition. After having a stroke, you are not able to drive for one month.

As stroke can affect you in different ways, it’s important for you to speak to your doctor or specialist about whether you can continue to drive.

If you’re left with visual field loss or double vision after your stroke, then you must not drive until this is fully assessment. It may mean that you won’t be able to continue driving longer term. The law states that if you develop a condition which may affect your sight, you must let the DVLA know. You may also wish to discuss your sight and DVLA sight standards with your orthoptist, optometrist (optician) or ophthalmologist.

## Where can I find sources of help?

Orthoptists play an important role in assessing and managing many of the visual problems that may result after a stroke. Visual training with or without optical aids can be led by orthoptists as well as professionals in low vision and optometrists. In addition, doctors, physiotherapists, speech therapists, rehabilitation workers, nurses and occupational therapists all play a major role in the rehabilitation and recovery process of people who have had a stroke. If you experience any visual difficulties following a stroke, it’s important that you have your eyes examined by eye care specialists.

There are also some useful resources available for people with vision problems following a stroke on the following links:

* VISION Research Unit: [**www.vision-research.co.uk**](http://www.vision-research.co.uk)
* British and Irish Orthoptic Society (BIOS): **www.orthoptics.org.uk/resources/clinical-advisory-group/stroke-and-neuro-rehabilitation/**

## Coping

It’s completely natural to be upset when you’ve been diagnosed with vision loss. Often there can be a lot of life changes in a short space of time. You may find that you are worried about the future and how you will manage with a change in your vision. All these feelings are natural.

Some people may want to talk over some of these feelings with someone outside their circle of friends or family. At RNIB, we can help you with our telephone Helpline and our Counselling and Wellbeing Team. Your GP or social worker may also be able to help you find a counsellor if you feel this may help.

Your eye clinic may also have a sight loss adviser (also known as an Eye Clinic Liaison Officer, ECLO or Vision Support Officer), who can be on hand to provide practical and emotional support about your eye condition.

## Help to see things better

If you do have some sight loss, there are lots of things that you can do to make the most of your remaining vision. This may mean making things bigger, using brighter lighting or using colour to make things easier to see. We have a series of leaflets with helpful information on living with sight loss, including how to make the most of your sight. You can find out more about our range of titles by calling our Helpline on 0303 123 9999.

If you have vision loss, then you may want to ask your ophthalmologist whether you’re eligible to register as sight impaired (partially sighted) or severely sight impaired (blind). Registration can act as your passport to expert help and sometimes to financial concessions. Even if you aren’t registered, a lot of this support is still available to you.

## Further help and support

If you have questions about anything you’ve read in this leaflet, or just want someone to speak to about your eye condition, please get in touch with us. We’re here to support you at every step.

**RNIB Helpline**

**0303 123 9999**

**helpline@rnib.org.uk**

Our Helpline is your direct line to the support, advice and products you need. We’ll help you to find out what’s available in your area and beyond, both from RNIB and other organisations.

Whether you want to know more about your eye condition, buy a product from our shop, join our library, find out about possible benefit entitlements, be put in touch with a trained counsellor, or make a general enquiry, we’re only a call away.

### Other useful organisations

**The Stroke Association**

240 City Road

London

EC1V 2PR

Helpline: 0303 3033 100

Website: [**www.stroke.org.uk**](http://www.stroke.org.uk)

**Different Strokes**  
9 Canon Harnett Court  
Wolverton Mill  
Milton Keynes MK12 5NF

Telephone: 0345 130 7172 or 01908 317 618

Website: **www.differentstrokes.co.uk**

**Chest Heart & Stroke Scotland Head Office**Third Floor, Rosebery House  
9 Haymarket Terrace  
Edinburgh  
EH12 5EZ

Telephone: 0131 225 6963

Advice line: 0808 801 0899

Website: [**www.chss.org.uk**](http://www.chss.org.uk/)

**British and Irish Orthoptic Society (BIOS)**

Salisbury House

Station Road  
Cambridge

CB1 2LA  
Telephone: 0203 853 9797

Website: [**www.orthoptics.org.uk**](http://www.orthoptics.org.uk)

Information and resources for patients:

https://www.orthoptics.org.uk/resources/clinical-advisory-group/stroke-and-neuro-rehabilitation/

**VISION Research Unit** have useful resources available free to patients and their families and carers

Website: [www.vision-research.co.uk](http://www.vision-research.co.uk)

Patient resources link: [www.liverpool.ac.uk/population-health-sciences/departments/health-services-research/research/vision/patient-resources/](http://www.liverpool.ac.uk/population-health-sciences/departments/health-services-research/research/vision/patient-resources/)

**Headway - the brain injury association**

Bradbury House

190 Bagnall Road

Old Basford

Nottingham NG6 8SF

Telephone: 0115 924 0800

Helpline: 0808 800 2244

Email: enquiries@headway.org.uk

Website: **www.headway.org.uk**

**Thomas Pocklington Trust**  
Entrance D  
Tavistock House South  
Tavistock Square  
London  
WC1H 9LG

Telephone: 020 8995 0880  
Website: [**www.pocklington-trust.org.uk**](http://www.pocklington-trust.org.uk)

**Driver and Vehicle Licensing Authority (DVLA)**

Drivers’ Medical Enquiries

Swansea SA99 1TU

Telephone: 0300 790 6806

Website: [**www.gov.uk/driving-medical-conditions**](http://www.gov.uk/driving-medical-conditions)

## We value your feedback

You can help us improve our information by letting us know what you think about it. Is this factsheet useful, easy to read and detailed enough – or could we improve it?

Send your comments to us by emailing us at [**eyehealth@rnib.org.uk**](mailto:eyehealth@rnib.org.uk) or by writing to:

Eye Health Information Service

RNIB

105 Judd Street

London

WC1H 9NE

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

All of our factsheets are available in a range of formats including print, audio and braille.

**Last updated: February 2021**

**Next review: February 2024**

