

Visual problems are common after a stroke and can affect up to two thirds of stroke survivors. There are several different types of visual difficulties and these can vary from slight to more severe, but there is a lot of help and support available. This factsheet explains the different types of visual problems that can occur after a stroke and the treatments or strategies for coping that are available. It also lists organisations that offer further advice.

Visual problems are **common** after a stroke and sometimes they occur **without any other disability being present**. Like other after-effects of stroke, visual problems **often resolve themselves** in time as the brain recovers, although where recovery doesn't happen, they can be quite difficult to adjust to. If a person is having trouble with vision, this can **affect** the rest of their **rehabilitation** – for example moving around could become more difficult. Problems with vision can sometimes be missed, so **if you think you or someone you know has visual problems after a stroke, talk to your doctor**.

Of course some **visual problems** may have existed **prior to your stroke**, for example ocular disease such as cataract, age-related macular degeneration, diabetic retinopathy or glaucoma. Also, you may have **poor eyesight** because you need **glasses to correct long or short sight**.

It is therefore important that **if you have any vision loss, you should have an eye examination to detect non-stroke-related visual problems** so they can be treated. This can make a considerable difference to eyesight, for example correcting short sight with glasses or continuing to take eye drops for glaucoma.

What are the visual problems than can happen after stroke?

Visual disturbance after a stroke falls into **several categories**, depending on exactly **where in the brain** the stroke occurred. These categories include:

- central vision loss
- visual field loss
- eye movement problems
- visual processing problems.

You could experience **one** or **several** of the above types of visual problems.



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Central vision loss

Central vision loss is the **partial or complete loss of vision in one or both of your eyes. Occasionally** visual problems are due to a **stroke affecting the eye only**. This is known as **retinal stroke** and occurs because of a **blockage** of one of the **blood vessels** to the **eye**. If you have had a retinal stroke, you may have been aware of intermittent **blurring** or **black-outs** of vision in **one eye** before your stroke.

However, **most commonly**, visual problems occur after a **stroke** which **involves the brain** because of a blockage in an artery leading to the brain (an ischaemic stroke) or because of bleeding from one of the blood vessels in or around the brain (a haemorrhagic stroke). Visual problems caused by a stroke are a result of **brain damage** and **not direct damage to the eye**. Central vision loss due to a stroke in the brain usually affects **both eyes**.

Visual field loss

The visual field is a term most commonly used to describe the **whole of what you can see** – from **straight ahead** to **outwards**, to the side (periphery).

Visual field loss after a stroke usually affects **both eyes**. It means that you are **unable to see properly either to the left or to the right** of the centre of your field of vision. Where you experience difficulties is directly linked to the **where the stroke occurred** in your brain. The extent of the problem can be shown by measuring your visual field.

Types of visual field problems

There are **many types** of visual field loss but the most common is **homonymous**

hemianopia, which accounts for two thirds of visual field loss following stroke. The word hemianopia means ‘without half-vision’ and this means you can **see only the right half or the left half of the world out of each eye**. This happens when the stroke occurs at the very back of the brain.

Other types of visual field loss include:

- loss of a quarter of the visual field
- loss of the entire upper or lower field of vision
- patches (scotomas) missing in the field of vision.

What are the symptoms of visual field loss?

Symptoms are a **loss of visual field**, usually to one side. You may have difficulty with **reading** which is a very common problem as it can be difficult to locate the **start of sentences** with **left-sided field loss**. Where there is **right-sided field loss**, reading may be more difficult because you may not be able to **see ahead** along the line of text. Using **markers** or **rulers** can highlight the beginning and end of sentences and help tracking across a line of text.

What are the treatments for visual loss?

Treatments for central visual loss

Treatment of **central visual loss** can include using **magnifiers** to increase the size of what is being viewed, **minifiers** to concentrate solely on the remaining area of retained vision and **anti glare glasses** or **overlays** to reduce excessive contrast of images and glare.

Treatments for peripheral visual field loss

Treatment of **peripheral visual field loss** comes under three options. It is important

for an **eye specialist** to **assess** your eye problems and give you individual advice and treatment:

- **Widening the field of view** with optical aids. This can be achieved using a plastic stick on **prism** on **glasses** to the side of the field loss. The prism creates a blurred image from the blind side which is seen superimposed on your clear vision and thus acts as a **prompt** or cue to look towards the blind side.
- **Training in compensatory strategies** is commonly used to **improve awareness** of the visual field loss and **promote eye and head scanning** into the blind side.
- **Visual restorative treatment** aims to **develop** and use **alternative brain pathways** for **visual information** in the brain. This utilises '**blindsight**' (if present), where you **cannot see stationary objects** in the blind field of vision but can build up **awareness of moving images** on that side. There are different forms of this treatment available in different countries but treatment is currently only available **privately** in the **UK** with an organisation called **Sight Science** (see useful organisations). As with any rehabilitation therapy after stroke, **recovery cannot be guaranteed** as the extent of the damage caused by a stroke is different for everyone.

At present, there are **few studies** which compare these different treatment options, so it is **unclear** which treatment is more beneficial and which patients find no benefit from these treatments. **Further research**

using randomised control trials is planned to try to address these issues.

Eye movement problems

Eye movement problems after stroke are due to **interruption** of the **nerve control** for creating eye movements. Problems can include:

- **Impaired eye movements** – these may affect your eyes' ability to move from one object to another or to follow a moving object. These can impede **reading** but also general **mobility**, for example if you are unable to look around quickly.
- **Inability to move both eyes up, down or sideways**. Where nerve control to the eye muscles is involved, **one eye may not move correctly** in one or more directions and you may have **blurred vision** or **double vision** (diplopia) because of the resultant turn of that eye (squint/strabismus).
- **Nystagmus**, which is where the eyes **constantly move**. You see objects constantly wobbling which can be very distressing and disorientating.
- **Impaired depth perception** and difficulty locating objects for example misjudging the position of a cup and pouring water over its edge rather than into it, or over-reaching for an object.

What are the treatments for eye movement problems?

There are a number of treatment options for eye movement problems. **Exercises** can improve eye movements where there is difficulty moving the eyes to look at objects held close to the face. **Prisms** can **join**

double vision or displace vision if you are unable to look to one side. A **patch** can also be used to eliminate troublesome double vision. However, a **patch** means you can only use one eye (**monocular vision**) which can also cause some difficulty. You must choose which option works best for you.

Visual processing problems

Visual information received from the eyes must then be **processed** by the **brain** to establish what it represents. For example **recognising colours, someone you know**, or the movement of **objects**. This can be affected after a stroke.

With visual processing problems, such as **inability to recognise colours, faces, objects, complex scenes or text**, it is important to use **adaptive** strategies such as using other senses (for example touch or hearing) to process the information in a different way and **relearn** or **adapt** visual recognition.

You may also experience a change in your **awareness and perception** of the world around you. This is called **visual neglect** and is the most common visual processing problem. It is more common in people who have had a stroke affecting the left side of the body.

Visual neglect is a disorder which can **reduce your ability** to look, listen or make movements **towards one half of your environment**. You may be **unaware** of **objects** and **people** on your **affected side** and may ignore people or bump into things without realising they are there. Fortunately there is **frequently good recovery** from visual neglect. However, where it is present,

continued input from **health care professionals** and **carers** is important to promote awareness of the affected side. Prisms, patches, occlusions and mirrors have been used on glasses to improve awareness in visual neglect but with limited success.

Visual hallucinations are quite common after a sudden loss of vision and can be very distressing. Identifying these and explaining their cause can be very reassuring.

Other eye problems

After a stroke there are a number of other difficulties you may experience in direct relation to the eye. **Weakness** of the **face muscles** and **eye lid muscles** can result in **difficulty closing one eye**. This can lead to dry eye and irritation and it is important that this is treated early with lubrication drops or ointment to prevent more serious eye complications such as ulcers.

You could also be **photophobic** (have increased sensitivity to light) and may benefit from tinted glasses or sunglasses.

Vision and driving

One of the most common queries after a stroke is whether you can return to driving. The DVLA/DVA states that you **may return to driving after one month** where there is **no lasting deficit** of function. Function does not only mean general mobility with full use of arms and legs, but visual function also.

The **DVLA/DVA** states that individuals **cannot drive** with **double vision, blurred vision** below a certain level or **visual field loss**, particularly that which interferes with central vision. Thus, **assessment** and

diagnosis of potential visual problems causing these problems is important so that **accurate diagnosis** is made, full and clear information can be given to you and treatment can be given if possible, which may help return your visual function to driving standards.

Where longstanding visual problems exist following stroke, **further advice** can be given regarding **adaptation** to the deficit and whether returning to driving may be an option. These assessments can be conducted in a **hospital eye department**. For more general information about driving please see our factsheet *F02 Driving after stroke*.

Which specialists can help with visual problems?

- An **orthoptist** is an eye care specialist whose role involves **assessing** and **treating** patients with a **range** of eye problems but particularly problems with **eye movements** and related impairment of vision.
- An **ophthalmologist** is a **medical doctor** specialising in the **diagnosis** and **treatment** of **diseases of the eye**.
- An **optometrist (optician)** is an eye care specialist who **tests sight, prescribes** and **dispenses glasses** or contact lenses and **screens** for **eye disease**.

Additional support is given by **support workers, visual rehabilitation officers** (VROs) and **eye clinic liaison officers** (ECLOs). These individuals work within **eye clinics** (ECLOs) or the **sensory teams in social services** (VROs) to provide direct information to stroke survivors and carers relating to **practical aids** and **emotional**

support. ECLOs provide a **bridge** between the eye care professions within the **hospital** and **other organisations** that can provide support at home. VROs help individuals to make use of their remaining vision and **utilise other skills** to **adapt** to their visual impairment.

Procedures for referral to specialists vary greatly across the UK. If you are in **hospital**, you should be referred to an **orthoptist** or **ophthalmologist** specialising in stroke and brain injury who can arrange assessment and treatment for poor vision, double vision or visual field loss. You may then be referred to a **low vision clinic** where you can receive an assessment and advice on using magnifiers or other visual aids.

If you are at home, your **GP** or **local optometrist** can refer you to one of these specialists. It is advisable, if at home, to see an **optician** who can at least establish that there are **no other sight problems** relating to the eye, or take into account **pre-existing eyesight difficulties**. They can make sure that your **spectacles** are the **best possible** under the circumstances. The optician may write to the GP who can make a referral to the hospital eye department for more specialist assessment.

Information about **equipment** and **household items** for people with impaired vision can be obtained from the **RNIB** or from the **Disabled Living Foundation** (see the 'Useful organisations' section at the end of this factsheet).

Registering your sight loss

Registering your sight loss can make it easier to get **practical help** from social

services, as well as entitling you to other **concessions**, such as the Disabled Person's Railcard and local travel schemes. If you choose to register your sight loss, an **ophthalmologist** can assess whether you qualify for registration as **sight impaired** (partially sighted) or **severely sight impaired** (blind). The **RNIB** (see 'Useful organisations') has more information on the process and benefits of registering your sight loss.

Tips for coping with visual problems

- If you have **double vision**, try **closing one eye** or using a **patch** when reading or watching television.
- If you have **lost your vision to one side**, it is important to **constantly move your eyes and head** towards the weaker side. The more you scan and move to that side, the quicker you will detect objects on that side and reduce your risk of bumping into objects or tripping.
- When **reading**, use **rulers** and **markers** to highlight the beginning and end of sentences and help keep your position along a line of text.
- Use **good lighting** which should be positioned to your side but not behind you, as this causes shadows.
- **Minimise** the number of objects that are on surfaces and particularly in the kitchen. If there is too much clutter on surfaces, it can be difficult to pick out individual items and this can cause confusion.

Useful organisations

All organisations listed are UK wide unless otherwise stated.

Royal National Institute of Blind People (RNIB)

Helpline: 0303 123 9999,

Website: www.rnib.org.uk

Provides **information** about all aspects of visual impairment, including **low vision aids** and the process of being **registered** as partially sighted or blind. Offers an **emotional support service** and over 100 **tele-befriending** social groups meeting weekly. Also provides details of **transcription** services.

England, 105 Judd Street, London WC1H 9NE, tel: 020 7388 1266

Northern Ireland, 40 Linenhall Street, Belfast BT2 8BA, tel: 028 9032 9373

Scotland, 12–14 Hillside Crescent, Edinburgh EH7 5EA, tel: 0131 652 3140

Wales, Trident Court, East Moors Road, Cardiff CF24 5TD, tel: 029 2045 0440.

RNIB National Library Service

PO Box 173, Peterborough PE2 6WS

Helpline: 0303 123 9999,

Website: www.rnib.org.uk

Email: library@rnib.org.uk

Specialist library, including talking books, for readers with sight loss in the UK.

RNIB Big Print

Customer services, PO Box 173, Peterborough PE2 6WS

Helpline: 0303 123 9999,

Website: www.rnib.org.uk

Email: shop@rnib.org.uk

Offers a weekly newspaper (including TV and radio listings) for those with sight difficulties.

Action for Blind People

14–16 Verney Road,
London SE16 3DZ
Helpline: 0303 123 9999
Website: www.actionforblindpeople.org.uk
Part of the RNIB. Local teams specialise in providing information and support with employment issues, welfare rights, housing and assistive technology. Also offers a mobile sight loss information service.

Visionary

PO Box 178,
Retford DN22 1DL
Tel: 01777 705 299
Website: www.visionary.org.uk
UK network of local charities for blind and partially sighted people, which are listed on their website.

Nystagmus Network

Tel: 0845 634 2630
Website: www.nystagmusnet.org
Email: john.sanders@nystagmusnet.org
Produce publications including *Understanding nystagmus*, *Nystagmus and driving in the UK* and *Computers and nystagmus*.

One Vision

Wardington Court, Welford Road,
Northampton NN2 8AG
Tel: 0845 108 3161
Website: www.one-vision.org.uk
A charity dedicated to helping people through sight loss in one eye and learning to live with monocular vision.

Partially Sighted Society

7/9 Bennetthorpe,
Doncaster DN2 6AA
Tel: 0844 477 4966
Website: www.partsight.org.uk
Email: info@partsight.org.uk

Offers a catalogue of resources including easy-to-see and talking clocks, watches and timers, large playing cards, large-print games, crossword books, calendars and diaries, large-piece jigsaws, bold-lined stationery and Magnascreen for TV's and computer monitors. Also offers publications such as *Visual problems and stroke*, *Obtaining magnifiers* and *Seeing things* that aren't there.

Sight Science Limited

William Guild Building, King's College,
University of Aberdeen, Aberdeen
AB24 3FX Tel: 07842 106 131
Website: www.sightscience.com
Email: info@sightscience.com
Sight Science provides a program of Neuro-eye Therapy (NeET) involving an interactive computer-based therapy for people with vision loss after stroke.

The Disabled Living Foundation (DLF)

380–384 Harrow Road,
London W9 2HU
National Helpline: 0845 130 9177
Website: www.dlf.org.uk
Email: helpline@dlf.org.uk
Provides information about aids and equipment for people with disabilities.

Driver and Vehicle Licensing Agency (DVLA) Drivers Medical Group (England, Scotland, Wales)

Drivers Medical Group, DVLA,
Swansea SA99 1TU
Tel: 0300 790 6806
Website: www.dvla.gov.uk
Email: eftd@dvla.gsi.gov.uk
Produces a *Customer Service Guide for Drivers with Medical Conditions* and an *At A Glance Guide to the Current Medical Standards of Fitness to Drive*.

**Driver and Vehicle Agency
Northern Ireland**

DVA Medical Section, Driver Licensing,
County Hall, Castlerock Road,
Coleraine BT51 3TB
Tel: 0845 402 4000
Website: www.dvlni.gov.uk
Email: dvlni@doeni.gov.uk
The sole driver, vehicle and vehicle operator
licensing authority in Northern Ireland.

Calibre

Calibre Audio Library,
Aylesbury,
Bucks HP22 5XQ
Tel: 01296 432 339
Website: www.calibre.org.uk
Free postal lending library of unabridged
books, recorded on standard audio
cassettes. Membership is open to children
and adults who are blind, partially sighted
and print disabled.

Listening Books

12 Lant Street,
London SE1 1QH
Tel: 020 7407 9417
Website: www.listening-books.org.uk
Email: info@listening-books.org.uk
A postal audio library service. Annual
membership starts from £20. This fee may
be paid by social services/local authority.

Playback Recording Service

Centre for Sensory Impaired
7 Gullane Street,
Glasgow G11 6AH
Tel: 0141 334 2983
Website: www.play-back.com
Comprehensive recording service providing
a newspaper and magazine reading service
and tape library.

**National Talking Newspapers
and Magazines**

National Recording Centre,
Heathfield, East Sussex TN21 8DB
Tel: 01435 866 102
Website: www.tnauk.org.uk
Email: info@tnauk.org.uk
National charity that records more than
185 national newspapers and magazines
on to audio CD. Some publications are
also available by email.

British and Irish Orthoptic Society

c/o The Chartered Society
of Physiotherapists,
14 Bedford Row, London WC1R 4ED
Tel: 020 7306 1135
Website: www.orthoptics.org.uk
Provides information on the eye problems
that occur following acquired brain injury,
including stroke. They have a stroke
specialist interest group and actively support
research on visual impairment after stroke.

Royal College of Ophthalmologists

17 Cornwall Terrace, London NW1 4QW
Tel: 020 7935 0702
Website: www.rcophth.ac.uk
Professional body for eye doctors. Offers
a range of information on eye conditions.

The College of Optometrists

42 Craven Street
London WC2N 5NG
Tel: 020 7839 6000
Website: www.college-optometrists.org
Professional body for optometrists in the UK.

Disclaimer: The Stroke Association provides
the details of other organisations for
information only. Inclusion in this factsheet
does not constitute a recommendation or
endorsement.

Glossary of terms

Depth perception = the ability to see the world in three dimensions

Hemianopia = loss of vision in one side

Homonymous hemianopia = seeing only the right half or the left half of the world out of each eye

Monocular vision = vision with one eye only

Nystagmus = a condition where the eyes move constantly

Ophthalmologist = a medical doctor specializing in diagnosing and treating diseases of the eye

Optometrist (optician) = specialist who tests sight, prescribes glasses and contact lenses and screens people for eye disease

Orthoptist = an eye care specialist who assesses and treats a range of visual problems, particularly eye movement problems

Peripheral vision = the field of vision out to both sides

Prism = plastic membrane which is applied to a person's glasses and which moves the position of objects when they are seen through the prism

Retinal stroke = a blockage in a blood vessel to the eye

Visual field = the whole of your vision from straight ahead to outwards to the sides

Visual impairment = term used to describe vision loss resulting in a significant limitation of visual capability. Can be caused by poor central or peripheral vision or eye movement problems

Visual scanning = training which encourages you to look in a systematic way to the right and left sides

For further information, phone the Stroke Helpline on 0303 3033 100,
email info@stroke.org.uk or visit our website www.stroke.org.uk

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For sources used, visit www.stroke.org.uk/information/our_publications.

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