

The logo for the British and Irish Orthoptic Society (BIOS) features the letters 'BIOS' in a bold, purple, sans-serif font. The letter 'O' is significantly larger than the others. Above the letters is a stylized graphic of an eye, with a thick orange arc representing the upper eyelid and several grey, curved lines representing the eyelashes or the shape of the eye.

BIOS

British and Irish Orthoptic Society

Eye movement problems following stroke and brain injury



Eye Movement Problems following Stroke and Brain Injury

1) What eye movement problems can people have after brain injury?

Problems with eye movements and eye position are common after brain injury. These problems are caused by injury to the brain itself and/or to the nerves controlling eye movements. Problems may include:

Squint (turning eyes)

Eye movement problems

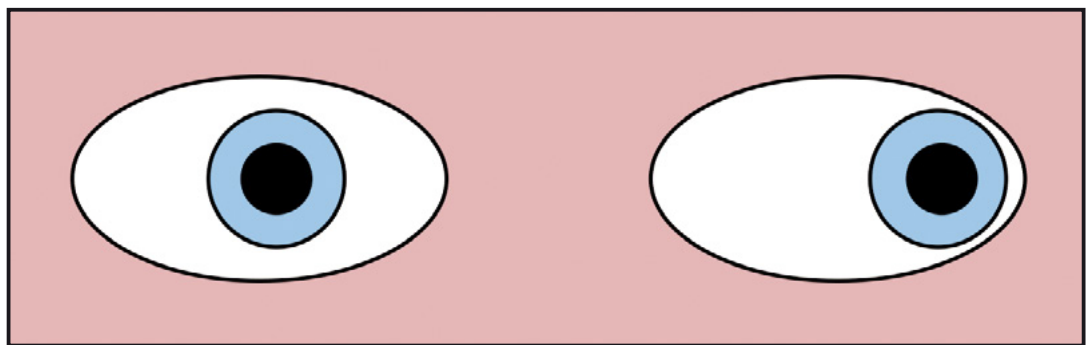
Nystagmus (wobbly eyes)

Eyelid problems

Symptoms can include: double vision, blurred vision, loss of depth perception (3D vision) and oscillopsia (moving images).

Squint

A squint is a misalignment or turning of the eye. The eyes do not look in the same direction; one eye may drift inward, outward, up or down or any combination of this.



The above illustration is an example of a left outward turning squint.

Squints can be present all of the time or intermittently. People with recently acquired squints may experience double or jumbled vision and/or loss of depth perception.

Eye movement problems

Brain injury can affect the movement of the eyes in a number of ways:

- **Scanning and tracking eye movement difficulties:** Tracking problems are when the eyes have difficulty following a moving target. Scanning eye movement defects are when the eyes have difficulty in looking between two different objects. These types of defects can cause difficulties with reading, mild dizziness when moving about and difficulty in concentrating on visual tasks.
- **Gaze palsies:** This is when both eyes are unable to look in a certain directions i.e. unable to look upwards. A patient with a right horizontal gaze palsy is unable to move their eyes sideways to the right. As a result they will often turn their face to the right in order to look to the right side because their eyes won't move in that direction.
- **Nerve/muscle palsy:** This is due to a weakness of one or more of the eye muscles. Each eye has six eye muscles that are responsible for moving the eyes. If the nerve supply to the muscle is affected by the stroke the muscle will not work effectively. The affected eye will not be able to move in the direction of the affected muscle(s). The person may experience double vision when they look in that specific direction. They may also notice one eye not moving in a certain direction.

Nystagmus

This is an involuntary movement of the eyes. The eyes can be seen to wobble or oscillate. Most commonly the eyes move from side to side but may move up and down or even in a circular motion. Nystagmus can be present all the time or may only be present when the person looks in a certain direction or if they are concentrating on something.

A person with nystagmus may notice their environment moving or oscillating. This is known as oscillopsia.

Eyelid problems

Following a brain injury the eyelids can be affected in a number of ways. For example:

- A droopy eye lid; this is known as a ptosis. The eyelid may be totally closed or just partially closed.
- Incomplete eyelid closure. The lid does not properly close, for example, when the person is asleep. In these cases it is very important to make sure the eye does not become dry and irritated – eye drops can be used to lubricate the eye.

Double Vision

Double vision is when two images are seen of the same object. The two images may be one on top of the other, side by side, or a combination of both. Double vision may be constant, it may come and go, or it may only occur when looking in a particular direction.

Double vision may be monocular i.e. only seen by one eye when the other eye is closed or binocular i.e. when both eyes are open. Binocular double vision is linked with a squint or eye movement defect. When one eye is closed the double vision will go away.



Loss of depth perception

Depth perception, also known as stereo-vision, is the ability to see in three dimensions (3D vision) and judge relative distance.

The presence of a squint results in loss of depth perception. A person will experience difficulties judging distances and depth. For example when pouring liquid into a cup, she/he may miss the cup. Also when going up or down steps it is difficult to judge the depth of a step and may lead to over or under step with risk of falls.



It can also lead to problems with crossing roads, as it is difficult to judge how far away a car is and the speed it is travelling at.

2) How can I tell if someone has a squint or eye movement problem?

- Their eyes may not look straight
- One or both eyes might have difficulty in looking in certain directions
- They might close one eye to avoid double vision
- They might use an abnormal head posture i.e. hold their head in a certain position to avoid double vision, to reduce nystagmus or centralise their field of eye movement
- They might have difficulty judging distance
- They may feel dizzy or lose their balance
- They may be more susceptible to trips or falls

3) How will a squint or eye movement problem affect someone?

Many people who have eye movement problems following a brain injury are aware of symptoms. These include: double vision, eye strain, headaches, reduced/blurred vision, dizziness, oscillopsia and difficulty reading or watching TV. They may also struggle with everyday tasks such as washing and dressing.

4) Can squints or eye movement problems recover?

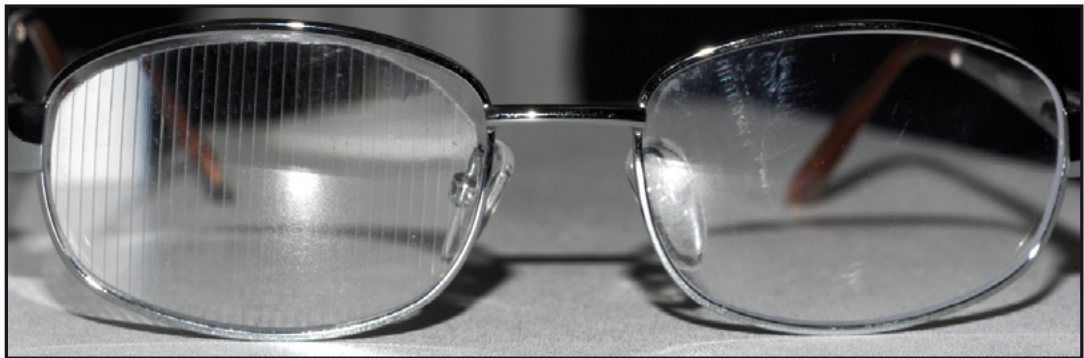
The recovery of squints and eye movement defects is variable. It is difficult to say whether they will recover or when. Sometimes there is no recovery or only partial recovery. It can take 6 months to a year for squints and eye movement defects to recover or stabilise.

When squints and eye movement problems are present it is important to get advice from an Orthoptist. They can help to improve or even eliminate symptoms.

5) What are the treatments for eye movement problems?

There are a number of options for the treatment of eye movement problems. The treatment depends on the problem and the symptoms experienced. Your Orthoptist will advise which treatments are suitable. They may include:

- Eye exercises - to improve eye movements and eye control, for example scanning movements
- Prisms - to join double vision or to move images into a more central position



Temporary prism attached to right lens of glasses to treat double vision

- An eye patch - to remove double vision or help reduce symptoms for certain types of nystagmus
- Compensation strategies such as using a head posture
- Eye muscle surgery may be considered once the eye movement defect has become stable.
- Botulinum toxin – an injection into an eye muscle to improve the eye position

6) What can be done at home to help someone with eye movement problems?

A number of things can be done to help people with eye movement problems, for example:

- If it is difficult for someone to look or move their eyes to one side, then position objects or seat friends and family to the unaffected side.

- For people with loss of depth perception it is advisable to alert them to steps and stairs until they get more used to judging distances and depth.
- De-clutter surfaces so it is easier for objects to be seen.

7) Can someone with eye movement problems drive?

Initially someone with eye movement problems is advised not to drive. It is illegal to drive with double vision or reduced vision.

Each brain injury is different and depending on how well the eye movement problem and other brain injury related problems recover, some people are able to return to driving.

Following an Orthoptic assessment, treatment and a period of adaptation some people are able to drive with a prism or with one eye occluded/patched. The Orthoptist will advise you when it is safe to drive.

The Orthoptist will advise you if you need to notify the DVLA about your eye condition. You will also need to notify your insurance company.



British and Irish Orthoptic Society

This leaflet was made by the Stroke and Neurological Rehabilitation Special Interest Group Steering committee in July 2016.

See www.orthoptics.org.uk for more information

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