

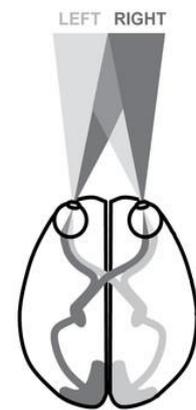
Visual Changes Which Can Follow Stroke

After a stroke up to 68% of people will experience short or long-term visual changes. These changes can be caused by damage to the eyes themselves, the muscles around the eyes, the area of the brain which processes visual information, or damage to the area which controls attention to visual information. Due to the variety of things that can be damaged visual changes can manifest in a number of different ways, some of which will respond to treatment while others will not. If you feel that your vision, or the vision of your loved one, has been impacted by stroke it is important to seek help from a medical professional.

Hemianopia

This is a loss of the left or right visual field, and is the most common visual change after stroke. Unlike visuospatial inattention, the individual is aware that they cannot see part of the visual field. They might only lose a small portion of the visual field, or they may lose an entire half. This results in what is effectively blindness on one side of their vision.

This is not the same as being blind in one eye, it is more like being half-blind in each eye. Imagine that your visual field is a circle. The left side of that circle is being seen by the right-sides of both of your eyes, while the right side of the circle is seen by the left-sides of both of your eyes. Hemianopia stops your brain from processing the information from either the left or right sides of both of your eyes, so you would only be able to see one side of the circle.



Visuospatial Inattention

This is a loss of the left or right visual field which the individual is not aware of. This is a processing problem, in that the brain is no longer processing information one side of the visual field.

Those who suffer from inattention (also known as hemineglect) will be biased toward only interacting with the side of the world they can see. An individual may only brush half of their hair, or shave half of their face, but not be able to identify that something is wrong.

There is some evidence that prism glasses may improve functioning for some people experiencing visuospatial inattention. Prism glasses shift the light coming into your eyes, in people with visuospatial inattention this can increase the amount of light hitting the functional part of their eyes. The glasses, however, do not work for everyone and do have side effects. Most people who use them experience more frequent headaches and have difficulty with their balance and depth perception.

Akinetopsia

This is a relatively rare side-effect of stroke which impacts an individual's ability to see movement. This issue tends to be transient, meaning that the individual usually recovers their motion-vision with time, however there are reported cases of it remaining for years after the stroke.

Your brain classes objects which are still and objects which are moving as different, because of this there is a chance to damage the 'moving object' identifiers in your brain without damaging the 'still object' identifiers. This is the case in akinetopsia. For affected individuals moving objects can appear slowed down, or broken up in to a series of 'freeze frame' images. This effect can be specific to just one side of the visual field, with objects returning to normal once they enter the other side of the visual field.

Oculomotor Cranial Nerve Palsy

Most of the muscles around the eye are controlled by the oculomotor cranial nerve. Around 10% of the visual problems experienced after stroke are due to damage to the oculomotor cranial nerve. As you might expect this kind of damage causes problems with the eye muscles. Individuals with oculomotor nerve palsy might be unable to move their eye, lift their eyelid, or may experience difficulty focusing their vision. The inability to move the eye properly can cause strabismus and double vision to develop.

When a person has double vision they're seeing images from each of their eyes individually instead of seeing them as one image. This can dramatically impact depth perception, causing difficulty judging distances or understanding how far away objects are from one another. Double vision can make people much more vulnerable to falls so it's important to move carefully in new areas.

Strabismus

Strabismus occurs in up to 26% of people after a stroke. Despite commonly being known as 'crossed eyes' strabismus simply means that the eyes aren't aligning to look at the same visual field. The eyes can be facing too far apart, too close together, or be facing different places vertically. This can result in depth perception problems, double vision, and often causes individuals to squint.

Strabismus is a muscular issue, so it is one of the few visual problems caused by stroke that can be altered by surgery. While surgery to correct strabismus is usually somewhat effective it is unlikely to restore vision to the way it was pre-stroke.

Pattern Glare

When looking at patterns, particularly stripes, people who have had a stroke are more likely to see visual distortions of experience visual stress than other individuals. This can cause eye-strain, headache, and the illusion of colour, shape, or motion in the pattern. While this is also experienced by people who have not suffered a stroke, the effect can be both more intense and also more easily provoked in people who have suffered a stroke.

Attentional Blink

People who have experienced a stroke, even if they have no other visual symptoms, are likely to have an extended 'attentional blink'. This means that when the individual is focusing on one visual object they are less likely to see another visual object. This effect becomes more intense the more of the individual's attention is taken up by the object they're looking at. If they are very intently paying attention to one object they may not see other important information which is presented at the same time.

This is not an exhaustive list of all visual problems which can be triggered by stroke. As mentioned there are a large number of systems which control vision, and changes to any one of them could cause a visual impairment. These impairments can manifest in many different ways, however those noted above are the most common. The quality of vision after stroke can have a huge impact on quality of life. If you have any concerns about your vision contact a medical professional and request a visual examination.