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Squint in children (Strabismus)

The medical name for squint is strabismus. It is a condition where the eyes do not always look in exactly the same direction. The difference in eye direction may be very slight, and may not always be present. Squint is one of the most common eye problems in children.

Most squints occur in young children. A child with a squint may stop processing information from the affected eye, so that it effectively stops seeing. This can lead to a type of visual loss in the affected eye, called amblyopia, which can become permanent unless treated early in childhood.

Treatment usually involves patching the good eye, to force the brain to start to use the affected eye. Sometimes corrective eye surgery is needed to correct a squint.

What is a squint (strabismus)?

A squint is a condition where the eyes do not line up perfectly together in the direction of looking. Whilst one eye looks straight at the object the person is looking at, the other eye is 'off direction'.

This may not always be obvious – some squints are very slight, and some are only present some of the time. The eye which is 'off direction' may turn to point inwards, outwards, upwards or downwards.

Some squints occur only when the affected person is tired, only when the eyes turn in a particular direction or only when the eyes are closed. Some squints are present all the time. Squints are common; they affect about 1 in 20 children, including babies. Most squints develop before the age of 3 years, although squints can develop in older children, or in adults.

This leaflet only deals with childhood squints.

When does a squint usually occur?

Some babies are born with a squint (strabismus); some babies and children develop a squint later. Acquired squints are sometimes caused by the eye trying to overcome a vision problem, such as short-sightedness, but in many cases the cause is unknown. Rarely, a squint may be caused by a condition in the eye itself.

In most squints one eye turns inwards or outwards. Less often, it may turn up or down.

What are the causes of squint in children?

Some types of squint (strabismus) are much more obvious than others. It might be clear that one eye obviously 'turns' or that a child cannot look directly at someone or something.

Another sign of squint is that the child might close one eye when looking at something, or tilt his or her head on one side. This is something a child does instinctively to suppress the vision from the affected eye, as otherwise they may 'see double'.

Congenital squint

Congenital squint means that the child is born with a squint, or the squint develops within the first six months of life. In most cases, these types of squint occur because the actions of the eye muscles are not perfectly balanced. The reason for this is not known.

In most cases one eye turns inwards. This is called congenital esotropia (sometimes called infantile esotropia). This type of squint can run in families, although many children with congenital esotropia have no other family members affected.

In some cases the eye turns outwards (congenital exotropia). Less commonly, a squint of unknown cause may result in an upward or downward turn of the eye.

Squint related to refractive errors

Refractive errors include: [myopia](#) (short sight), [hypermetropia](#) (long sight) and [astigmatism](#) (a distortion of vision because the front of the eye is not perfectly curved).

Refractive errors lead to problems with focusing. When the child with a refractive error tries to focus to see clearly, one eye may turn, leaving the other eye to do the seeing on its own. This type of squint tends to develop in children who are 2 years or older, in particular in children with long sight. The squint is most commonly inward-looking (an esotropia).

Other causes of squint

Most children with a squint have one of the above types of squint and have no related health or development problems.

However, in some cases, a squint is one feature of a genetic or brain condition that also affects the child in other ways. Squints can occur in some children with [cerebral palsy](#), Noonan's syndrome, [Down's syndrome](#), hydrocephalus, brain injury or [tumour, a rare type of eye cancer \(called retinoblastoma\)](#) and several other conditions.

If a child develops a squint is it very important to be reviewed in case one of these rare but very serious causes of squint is present.

Are there different types of squint?

There are several different types of squint (strabismus). Squints can be classified or described in various ways, including:

- By the direction of the squinting eye (ie the eye not looking perfectly in the direction of gaze):
 - An eye that turns inwards is called an esotropia.
 - An eye that turns outwards is called an exotropia.
 - An eye that turns upwards is called a hypertropia.
 - An eye that turns downwards is called a hypotropia.
- By how constantly the squint is present:
 - A squint which is present all the time is called a constant squint.
 - A squint which comes and goes is called an intermittent squint.
- By when the squint is seen:

- • If it happens when the eyes are open and being used it is called a manifest squint.
- • If it happens only when the eye is covered or shut it is called a latent squint.
- By whether the severity of the squint is the same in all directions or not:
 - A concomitant squint means that the angle (degree) of the squint is always the same in every direction that you look. That is, the two eyes move well, all the muscles are working but the two eyes are always out of alignment by the same amount, no matter which way you look.
 - An incomitant squint means that the angle of squint can vary. For example, when you look to the left, there may be no squint and the eyes are aligned. However, when you look to the right, one eye may not move as far and the eyes are then not aligned.
- By age of onset:
 - • Most squints develop at some time in the first three years of life. Some develop in older children and in adults.
 - Squints that develop in children usually have different causes to those that develop in adults.
- By the cause:
 - • In many cases of childhood squint, the reason why a squint develops is not known.
 - In some cases of childhood squint (and most cases of adult squint), the squint occurs because of a disorder of the eye, the eye muscles, the brain or the nerves.

How common is squint in children?

About 5 in 100 children aged five years have a squint (strabismus).

It is quite common to notice a brief squint in children when they are tired or daydreaming. Babies sometimes cross their eyes – it is quite normal for this to happen occasionally, especially when they are tired. However, when a squint is not just occasional and due to tiredness, it is important to seek medical advice, as these squints can sometimes affect a child's vision.

What problems can be caused by a squint in a child?

Whilst a squint (strabismus) may be caused by poor vision, this is not the most common cause of a squint. However, once a squint is present in a young child, it can itself cause poor vision by preventing the affected eye from learning to see.

Will a squint affect my child's vision?

Newborn babies have the apparatus needed to see but at birth can only focus on a distance of about 12-15 inches, and the area of the brain that processes and interprets what they see has not yet learned to do so.

As your baby starts to see more, the parts of the brain (the visual pathways) that process the light the eyes receive, learn and develop and the brain learns to interpret the light from the eyes as a picture of the world. The window of opportunity for the brain to learn to do this is only present in the first 7-8 years of life. After this time, the visual pathways and the 'seeing' parts of the brain are fully formed and cannot change.

What is amblyopia?

If, for any reason, one eye does not see anything, then vision is not learnt properly by the pathways in the brain serving that eye. This results in impaired vision (poor visual acuity) in that eye, and is called amblyopia. It is sometimes referred to as 'lazy eye'.

The visual loss from amblyopia cannot be corrected by wearing glasses, as it is not a problem with the focus of the eye itself, but with the pathways in the brain that serve the eye. It is a new problem, caused by the squinting, in addition to whatever else is causing the eye to squint.

The treatment for amblyopia is to prevent the squinting early enough to give the vision processing parts of the brain a chance to develop.

If amblyopia is not treated before the age of about 7-8 years, the visual impairment usually remains permanent.

Squint is the most common cause of amblyopia.

[See the separate leaflet called Amblyopia \(Lazy Eye\) for more details.](#)

Will a squint make my child unhappy?

Apart from its effects on vision, a squint can be a cosmetic problem for a child. Many older children and adults who did not have their squint treated as a child have reduced self-esteem because their squint is noticeable.

Will a squint affect my child's binocular (depth) vision?

When the eyes move together perfectly, both eyes look and focus on the same spot. This is called binocular vision (bi- means two and ocular means related to the eye). The brain combines the signals from the two eyes to form a three-dimensional image.

If you have a squint, the two eyes focus on different spots. In children with squint this does not usually cause double vision, as the brain quickly learns to ignore the signals from the eye which is 'off line'. The child then **effectively** only sees with one eye.

Although combining images from two eyes is not the ONLY way we see depth, it is the main tool we have for it. (We do in addition judge distance and depth by using clues like shadows and colours, and the way objects move relative to one another as we move our heads.) However, seeing with only one eye means the child does not have a good sense of three dimensions or of depth when looking at objects.

(Adults who develop a squint often have double vision, as their developed visual pathways cannot ignore the images from one eye.)

How is a squint diagnosed and assessed?

It is important to diagnose a squint (and amblyopia) as early as possible, so that treatment can be offered to allow your child's visual pathways to develop as normally as possible.

Routine checks to detect eye problems in babies and children are usually done at the newborn examination and at the 6- to 8-week review. There is also a routine preschool or school-entry vision check.

Some newborn babies have a mild intermittent squint that reduces by 2 months of age and is gone by 4 months of age. However, fixed squints are usually permanent unless treated. So, as a guide:

- A squint seen in a newborn baby is likely to resolve if it comes and goes (is intermittent), reducing by 2 months of age and gone by 4 months of age.
- A baby with a constant fixed squint, or with an intermittent squint that is worsening from 2 months, should be referred for assessment.

Any baby or child with a suspected squint is usually referred to an orthoptist. An orthoptist is a health professional who is specially trained to assess and manage children with squint and 'lazy eye' (amblyopia). An orthoptist may also refer a child to an eye surgeon (ophthalmologist) for further assessment and treatment.

Various tests can be done to check a child's vision, even in babies. Tests to find a squint can involve covering and uncovering each eye in turn. This often shows which eye has the squint and how it moves.

The pupils of the eye can be checked with a torch, to check they become smaller (constrict) with light and widen (dilate) when the light is removed. An ophthalmoscope is a hand-held magnifier used by eye specialists to examine the back of the eye.

Very occasionally a scan of the eye or the brain may also be needed.

What are the treatments for squint in children?

Treatment for a squint (strabismus) usually involves some or all of the following:

- Treating 'lazy eye' (amblyopia).
- Wearing glasses to correct any refractive error in either or both eyes.

- Strabismus surgery to correct the appearance of the squint itself. This may help to restore binocular vision.

Treating amblyopia

The main treatment for amblyopia is to restrict the use of the good eye, in order to force the lazy eye to work. If this is done early enough in childhood, the vision will usually improve, often to a normal level. The common way this is done is to put a patch over the good eye.

The length of treatment with an eye patch varies with the age of the child and the severity of the amblyopia. The patch may be worn for a few hours a week or for most of the day. Treatment is continued until either the vision is normal or until no further improvement is found. This may take from several weeks to several months.

The child will be followed up, usually until about 8 years of age, to make sure that the treated eye is still being used properly and does not become amblyopic again. Sometimes, further patch treatment is needed.

Occasionally, eye drops to blur the vision in the good eye, or glasses that prevent the good eye from seeing clearly, are used instead of an eye patch.

Vision therapy can also be used to maintain the good work achieved by eye patching. This involves playing visually demanding games with your child to work the affected eye even harder.

Note: eye patching and other treatments for amblyopia aim to improve vision; they do not by themselves correct the appearance of a squint.

Correcting refractive errors

If a child has a refractive error (long or short sight, or astigmatism) then glasses will be prescribed to correct vision in the affected eye(s). This may also straighten the squinting eye.

Strabismus surgery

Often a surgical operation is advised to make the eyes as straight as possible. The main aim of surgery is to improve the appearance of the eyes. Surgery can also improve or restore binocular vision (helping the child to see depth better).

Squint surgery is a very common eye operation which usually involves tightening or moving one or more of the eye muscles. As the muscles are attached quite close to the front of the eye they are quite accessible for the surgeon. Squint surgery is usually a day-case procedure.

Botulinum toxin

[Botulinum toxin injections](#) to specific eye muscles are sometimes used as a treatment for certain types of squint, particularly those that turn inwards (esotropia), as an alternative to surgery.

Botulinum toxin (also known as Botox®) stops muscles from working. It is used for conditions where it is helpful to weaken one or more muscles to prevent them from pulling so hard.

Usually only one muscle is injected, and the procedure is done under local anaesthetic. Unlike in other conditions, in which the effects of botulinum toxin are transient and can be sustained only with repeated injections, its effects in some types of squint can be permanent. However, botulinum toxin is not commonly used in children.

What is the outlook (prognosis)?

Outlook for 'lazy eye' (amblyopia)

Generally, the younger the child is treated, the quicker the improvement in vision is likely to be and the better the chance of restoring full normal vision.

If treatment is started before the age of about 7 years then it is often possible to restore normal vision. If treatment is started in older children then some improvement in vision may still occur but full normal vision in the affected eye is unlikely ever to be achieved.

One of the problems with patching vision for amblyopia is that children don't want to wear the patch, and don't wear it enough for it to be effective. There is ongoing research into various special spectacles that encourage children to use the lazy eye.

For example, LCD shutter glasses which give a blurred image to the strong eye and a clear image to the weak eye. Children are asked to watch a 3D movie wearing the glasses for one hour each day.

Outlook for the appearance of squint

Squint (strabismus) surgery usually greatly improves the straightness of the eyes.

Sometimes two or more operations are needed to correct the squint. Sometimes a special stitch is put in place which can be adjusted later on if further correction is needed.

It is possible that several years after successful surgery, the squint may gradually return again. A further operation may then be an option to restraighten the eyes.

Will the squint return after treatment?

Most patients notice improvement in their squint (strabismus) after a single episode of surgery. It is not always possible to predict perfectly the amount of correction to the eye muscles needed to achieve perfect eye alignment in every direction, and sometimes squints return slightly over time. It is fairly common for children (and adults) to need further surgical or Botox® treatment over time.

What is vision therapy?

Vision therapy (VT) is a term used by optometrists for therapies aiming to develop or improve visual skills and abilities. It consists of trained exercises performed over weeks to months, together with, lenses ('training glasses'), prisms, filters, patches, electronic targets, or balance boards. It focuses on improving visual skills in 'lazy eye' (amblyopia) and many binocular vision anomalies.

Some other types of VT are controversial in eye medicine, partly because they are promoted by some practitioners as treatment for conditions such as learning difficulties and dyslexia, although medical and optometry organisations have concluded that there is no clear evidence that it is helpful in these conditions.

Vision therapies do not correct refractive errors such as short-sightedness (myopia).

There are three main categories of vision therapy:

Orthoptic vision therapy

This is 'standard' vision therapy focusing on binocular vision and eye movements. It is practised by orthoptists, optometrists, behavioural optometrists, paediatric and general ophthalmologists.

It addresses eye strain, [headaches](#), squint (strabismus), double vision (diplopia) and reading. Orthoptic VT usually involves a series of exercises practised over several months in order to improve binocular eye functionality.

Orthoptists are professionals who evaluate and measure eye deviations, manage amblyopia treatments and commonly treat small intermittent symptomatic eye deviations.

Behavioural vision therapy, or visual integration vision therapy

This aims to treat problems including difficulties of visual attention and concentration, which are treated as visual information processing weaknesses, using eye exercises.

It is practised primarily by specialist optometrists. Many major medical organisations, including the American Academy of Ophthalmology, have concluded that it is of no proven clinical benefit. Optometric organisations, including the American Optometric Association, support it only for non-strabismic conditions (ie not for strabismus).

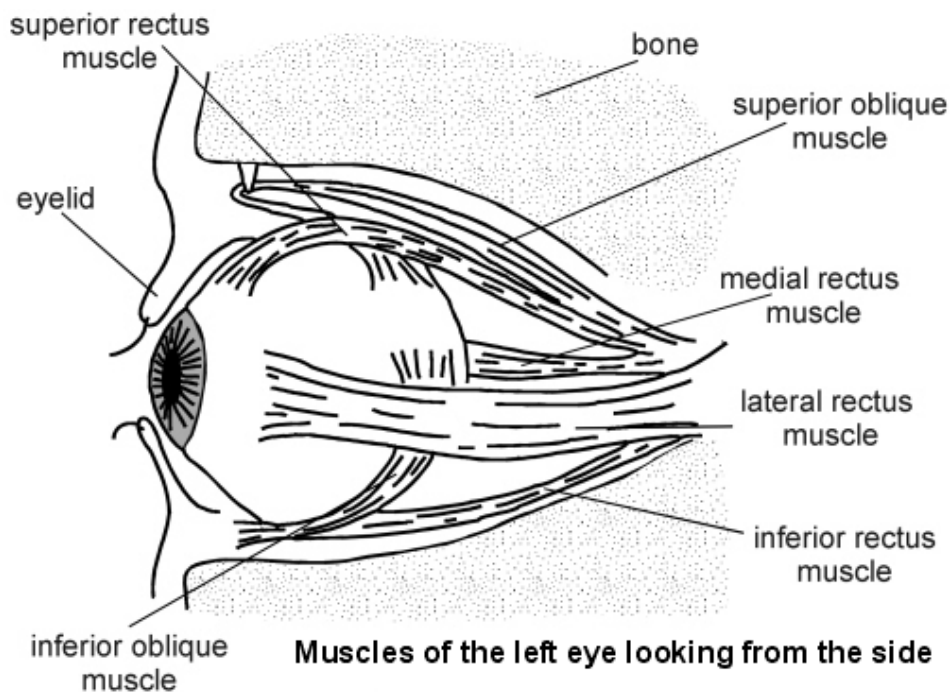
Alternative vision therapy

Alternative vision therapies are usually offered by unlicensed practitioners, though a minority of optometrists also provide them. These treatments are controversial, as they are sometimes promoted as being effective alternatives to mainstream treatments for dyslexia and learning difficulties, as well as for visual disorders, and they may be costly.

Many scientific studies have demonstrated that ocular coordination, motility, and visual processing are normal in children with dyslexia. The scientific evidence does not support the use of eye exercises or behavioural/perceptual vision therapy in improving the long-term educational performance in children with learning disabilities.

Understanding the eye muscles

The movement of each eye is controlled by six muscles. Each pulls the eye in a specific direction. A squint develops when the eye muscles do not work together in a balanced way, so that the eyes do not move together correctly.



The eye is a ball in a socket, and each muscle actually 'rolls' the eye in its socket, allowing us to look in multiple different directions.

- The **lateral rectus muscle** rolls the eye outwards, turning the gaze outwards.
- The **medial rectus muscle** rolls the eye inwards, turning the gaze towards the nose.
- The **superior rectus muscle** pulls the eye upwards and slightly inwards.
- The **inferior rectus muscle** pulls the eye downwards and slightly inwards.
- The **inferior oblique muscle** tends to turn the eye outwards and upwards.

- The **superior oblique muscle** tends to make the eye look downwards towards the mouth and, together with the inferior oblique muscle, stops the eye rotating around the pupil as the other eye muscles work.

In order for both of our eyes to turn to look at the same thing, we need the eye muscles on one side to coordinate perfectly with the eye muscles on the other side. For example, to look to the left, the lateral rectus muscle of the left eye pulls the left eye outwards and the medial rectus muscle of the right eye pulls the right eye inwards towards the nose.

If this doesn't happen, either because the eye muscles on one side don't receive exactly matching signals from the brain, or because the eye muscles respond unequally to those signals, then the eyes will not point in a perfectly matching direction.

Dr Mary Lowth is an author or the original author of this leaflet.

Further reading

- [Guidelines for the Management of Strabismus in Childhood](#); Royal College of Ophthalmologists (2012)
- [Moorfields Eye Hospital: Botulinum Toxin Treatment for Squint in Children](#), August 2018
- [Research into improving treatments for amblyopia](#), or 'lazy eye', Moorfields Eye Charity, September 2018
- [Rowe FJ, Noonan CP](#); Botulinum toxin for the treatment of strabismus. Cochrane Database Syst Rev. 2017 Mar 2;3:CD006499. doi: 10.1002/14651858.CD006499.pub4.

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