

The Royal College of Ophthalmologists



Parent Information Squint/Strabismus

This leaflet is designed to answer some of the general queries relating to squint in childhood.

The Children's Eye Care Team

An **OPHTHALMOLOGIST** is a doctor who specialises in eye disorders. A **PAEDIATRIC OPHTHALMOLOGIST** specialises further in eye disorders in children. One of the commonest disorders is squint.

An **ORTHOPTIST** is specifically trained to assess children with squint and "lazy eyes". They are also experts in binocular vision (part of this is 3D vision). The orthoptist will be the person who will be most closely involved in your child's treatment.

An **OPTICIAN (OPTOMETRIST)** tests for and prescribes glasses, if required. They can also examine the eye for other diseases.

All professionals combine to provide the best possible care for your child. The priority is to achieve good vision in each eye, then ocular alignment (straighten the eyes), then binocular vision.

What is a squint?

A squint is a condition in which one eye is out of alignment i.e. one eye looks straight ahead whilst the other eye turns inwards, outwards, up or down.

Squints may be constant (apparent at all times) or intermittent (only apparent at certain times). The majority of squints appear in the first three years of life, but some may develop later.



How does a squint affect eyesight?

Squints in childhood can damage the vision leading to poor sight (amblyopia or "lazy eye"). The presence of a squint may indicate an optical error (need for glasses). Squints can sometimes be avoided by early and correct use of glasses. Children **DO NOT usually** grow out of true squints. (Some small children may appear to squint when in fact they don't – this is sometimes termed "pseudosquint".)

It is therefore essential that squints are examined by an eye specialist to assess their eye sight (visual acuity), for any need for glasses (refraction) and the eyes

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themselves. A child is never too young to be assessed or treated, and glasses may be suggested in some children who are as young as a year of age.

What causes Squints?

The commonest form of squint in childhood in the UK is one where the eye turns in towards the nose (convergent squint or esotropia). These children often have an optical error (a need for glasses also known as a refractive error) called hypermetropia (hyperopia, long sight). When a child or young person focuses from the distance to an object near by, they do this by altering the optics of their eyes. This process is called accommodation. If a child has hypermetropia, they have to focus (or accommodate) their eyes to see clearly even in the distance, and accommodate even more to see objects that are close. The eyes also move inwards to look at an object near by (a process termed convergence). In some children who are hypermetropic (or long sighted) the effort of focussing (accommodation) to see clearly, drives the eyes inwards causing a squint. The process is not fully understood, as some children who have hypermetropia, do not squint. Some children whose eyes turn in (esotropia) have little or no hypermetropia.

In some children an eye turns outwards (exotropia or divergent squint). This is commonly seen when children are tired or not concentrating. They are also sometimes observed to close one eye in sunlight. The cause of this form of squint (intermittent exotropia) is not known.

In rare cases squints can be caused by neurological or brain problems, for example if there is a high pressure in the fluid around the brain.

Treatment

Glasses

Your child will be tested for glasses. In young children (less than 5 years old) this test should be done with the use of drops to control the focusing of the eye so that an accurate measurement is obtained. This is called a cycloplegic refraction.

There are three basic types of refractive error: long sight (hypermetropia, hyperopia), short sight (myopia) and astigmatism. Astigmatism means that the correcting lens is not a sphere (like a soccer ball) but steeper in one direction as compared to the other (like the surface of a rugby ball). Astigmatism can co-exist with either hypermetropia or myopia, or it can be "mixed (i.e. one meridian (axis) is longsighted, one meridian is short sighted).

The term "long sight" does not describe what they see very well, as children often see as well (or as badly) for both distance and near objects by using their accommodation. Hypermetropia is corrected using a convex lens in spectacles. The

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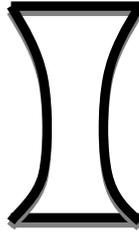


opposite to this is a concave lens which is used for short sighted people (myopia). Myopes can't see clearly in the distance, hence the term "short sighted".

Convex Lens



Concave Lens



Long sighted children need to put in effort to focus to see in the distance, and even more effort to see clearly at near. This means that they may tire more quickly doing close work. They may rub their eyes, or (if old enough) complain of eye strain or headache. Paradoxically uncorrected longsighted children may sometimes watch the television very close too (which means others can't!). Despite this they are often noted to be able (like other children) to pick up small items.

A small degree of hypermetropia is normal in children and usually does not need treating if there is no squint. However, if it is associated with a squint then glasses may be considered to try and control the focussing effort (accommodation), which in turn controls the squint.

If glasses are prescribed your child will usually need to wear them constantly so that an assessment can be made as to whether the glasses affect the eyesight and the squint. This assessment is usually carried out after approximately 6 weeks of full time wear of the glasses.

Glasses may partially or completely straighten the eyes in certain types of squint. However the squint may still be noticeable when the glasses are not worn. This is commonplace – it doesn't mean the glasses are not working, just that they need to be worn to work!

Amblyopia

Amblyopia is a term describing poor visual acuity (scored by reading letters on the chart). It can be caused by uncorrected refractive error (hypermetropia, myopia or astigmatism), squint, or an obstruction to vision (stimulus deprivation) for example a cataract. It may be present in both eyes, but more commonly affects one eye.

The term "lazy eye" is used sometimes to describe an amblyopic eye.

Young children's brains usually prevent the double vision which would be caused by a squint by ignoring the image from the squinting eye. This process is initially reversible and is called suppression. When the non squinting eye is covered up, the vision returns in the squinting eye, but when both eyes are open the central vision from the squinting eye is ignored - the brain suppresses it to prevent double vision.

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3
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In amblyopia, when the straight eye is covered, the squinting eye (amblyopic eye) still has poor vision. If this is present for a long time, it becomes established and difficult to treat, and may become irreversible.

Amblyopia is treated first by the use of correct glasses, then patching of the “good” (non squinting) eye. Sometimes drops are used as alternative to patching.

Patching treatment **DOES NOT** straighten the eye, but is **VERY** important as it is the most effective method of improving the sight in the “lazy” eye.

Although patching can be carried out until approximately 7-8 years old, the best results, if the “lazy” eye is caused by a squint, are achieved in younger children.

The amount and duration of patching needed varies from child to child. It also depends upon the level of vision, age and co-operation.

Binocular vision

Sometimes treatment is needed to support or help the two eyes working together.

Binocular vision is one of the most advanced processes in the brain. The two eyes sit in different positions in space so that the image formed from each eye is slightly different as the object being viewed has a slightly different perspective. This difference is called disparity. In theory we should all see double for everything except a very small point in space at the centre of our vision. The fact that we don't is down to brain processing power. The brain takes the two images that are slightly different and forms one – a process called fusion.

Some children demonstrate fusion but no stereopsis (3D vision). This is because the brain's binocular system is functioning at a sub normal level. In normal binocular vision, the brain processes the amount of disparity and computes the depth. This is how 3D films work by giving the two eyes two different (disparate) images.

It is important to note that there are other ways of “seeing” depth. The brain uses other clues, such as parallax, texture, lighting and shadows, movement and prior knowledge of the size of objects. Thus children who have no binocular vision can still appreciate depth.

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Squint Surgery

There are a number of reasons that surgery for a squint might be discussed. These include poor appearance of the squint (with glasses, if required) promoting binocular vision, worry about the loss of binocular vision, poor control of the squint, to treat a compensatory head posture and to eliminate double vision or eye strain. More than one operation may be needed in order to achieve the desired results.

Follow up appointments are still required after an operation. Your child may still need to wear glasses (if indicated), and if the vision in the squinting eye becomes “lazy” again he/she may need further patching treatment.

Paediatric Sub-Committee

ⁱ Photograph courtesy of Mr Robert Taylor, Consultant Ophthalmologist