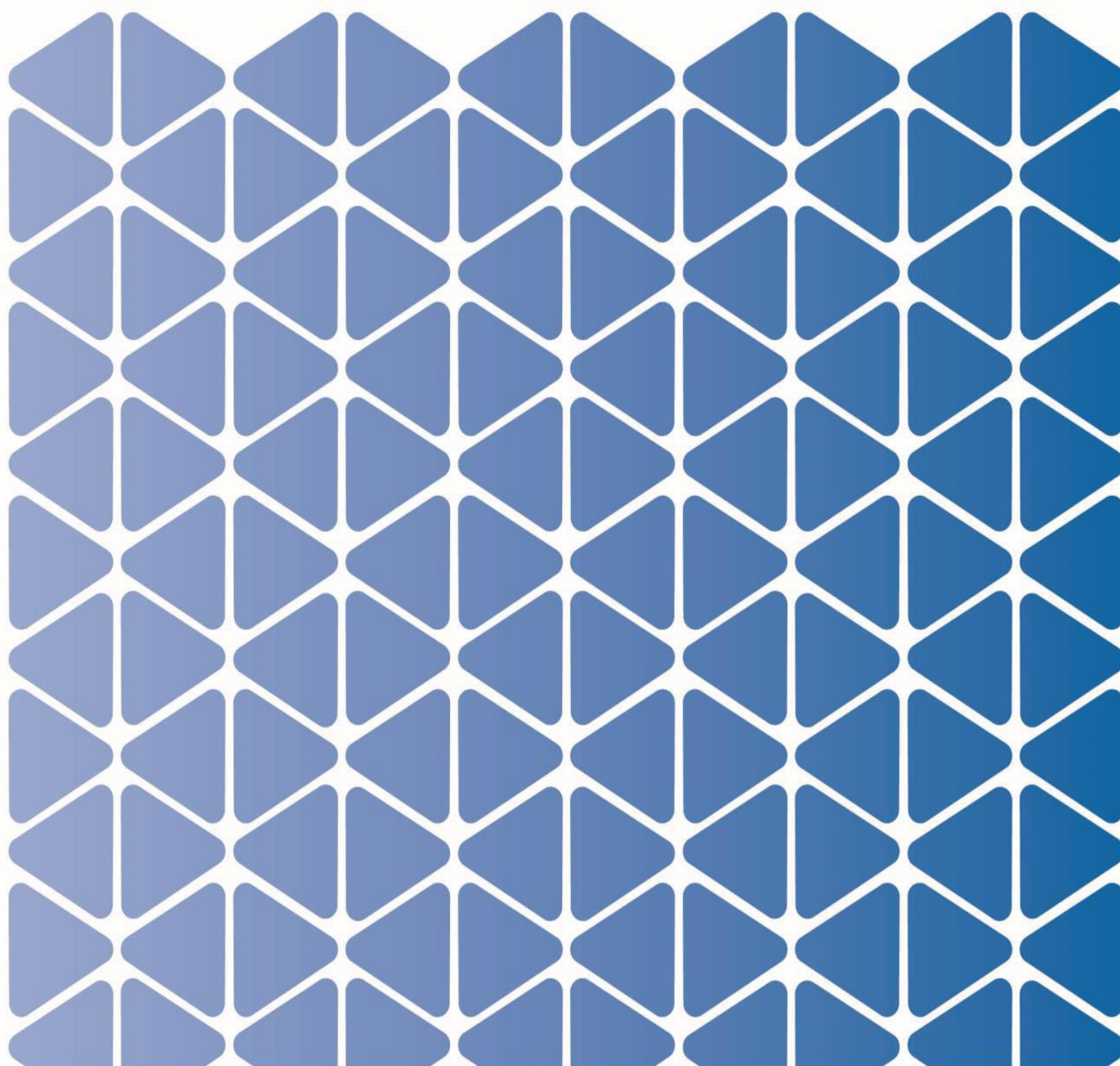


PATIENT INFORMATION**MYOPIA (SHORT SIGHT) IN
CHILDREN**

Introduction

Please ask for help if you are not happy to read English. This leaflet is about children with myopia (say 'my-owe-pee-uh'). This is also known as short-sight or near-sightedness. Please ask the optometrist (optician), the orthoptist or the ophthalmologist (eye doctor) if there is something you do not understand, or if you have more questions. Please see other leaflets for information about hyperopia (long-sightedness), information about 'lazy eye' (amblyopia) and information about children's glasses (spectacles). This leaflet does not discuss everything about myopia.

What is Myopia? What Makes an Eye Myopic (short-sighted)?

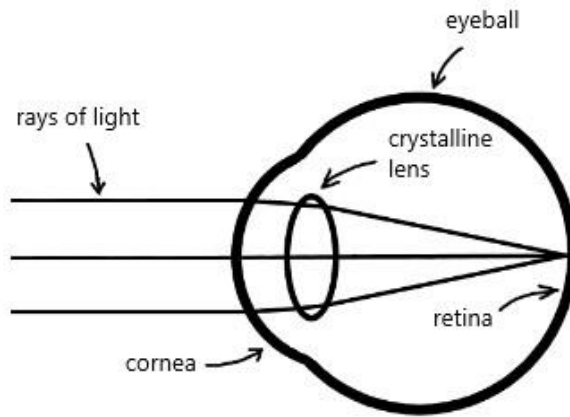
The eye is like a camera. The retina is a layer of cells at the back of the eye, like the film or sensor at the back of a camera. For a person to see an object clearly, the light from it must be focused on the retina. The eye has two lenses that focus the incoming light. The first lens is the cornea (the 'front window of the eye'). The second lens, called 'the crystalline lens', is inside the eye. A muscle inside the eye can change the focusing strength of the crystalline lens, for example, to focus on a close object. In adults, when this focusing muscle is relaxed, the light from a distant object should ideally be focused on the retina. In children, the focus is usually slightly behind the retina but normally, the focusing muscle can easily bring the focus onto the retina. If the light is focused in front of the retina, the eye has myopia (see diagram below). Myopia may be due to the lenses of the eye being too strong or to the eye being too long. (Hyperopia or long-sightedness is the opposite.)

How does Myopia Affect a Child?

A child with myopia will not have clear vision for distant objects. The more the myopia, the more blurred the distance vision will be and the stronger the correcting glasses will need to be. The amount of myopia is measured in dioptres. One dioptre of myopia typically means that a person without glasses can read only halfway down a standard eye test (Snellen) chart. In the UK, up to 3 dioptres is regarded as 'low myopia' and more than 6 dioptres as 'high myopia'.

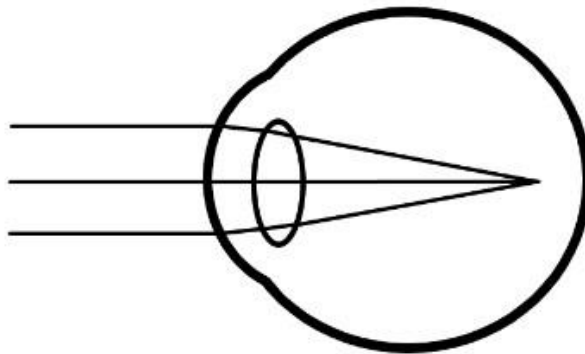
Eye with Perfect Focusing

Light from a distant object is focused on the retina, giving sharp vision



Myopic Eye

Light from a distant object is focused in front of the retina, giving blurred vision



Myopic Eye with Glasses

Light from a distant object is focused on the retina, giving sharp vision

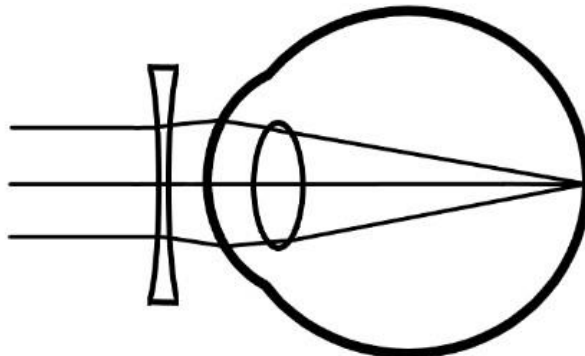


Diagram comparing an eye with perfect focusing with a myopic eye and a myopic eye with glasses

Does the Amount of Myopia Change?

Myopia commonly increases, so that glasses may need to be strengthened every 6 to 12 months. We can only find the true amount of myopia if the focusing muscle is completely relaxed. Before we test the focusing of the eyes in young children, we usually use eye drops to relax the focusing muscles. If these drops are not working well, the eye may appear to be more myopic than it really is. (This particularly happens in children with brown eyes.) The drops usually work better as the child gets older, so that testing becomes more accurate.

Why do some Children have Myopia?

Myopia may develop when the growth of the eye is not well controlled. For example, myopia in a pre-school child can be due to a preterm (premature) birth, or a problem with the retina. In older children, myopia commonly develops because children have inherited genes from parents with myopia. There are other things that are associated with myopia, such as educational achievement, living in a city, and increased time spent reading or using a mobile phone. These things may be associated with children spending less time outdoors. In general, children who spend a lot of time outdoors are less likely to develop myopia.

What is Anisometropia?

The amount of myopia may be different for each eye. When this difference (anisometropia) is significant, there is a risk of one eye becoming 'lazy' (amblyopic). This risk is reduced when each eye is correctly focused with glasses. You can read more about amblyopia ('lazy eye') in another leaflet.

What is Astigmatism?

The lenses that focus the eye are supposed to have the shape of the surface of a football, that is, a sphere. In eyes with astigmatism, at least one of the lenses is shaped like the surface of a rugby ball. This means that the shape is slightly more like the curved surface of a tin of food, that is, a cylinder. Astigmatism causes blurring for both near and distance vision. When someone with astigmatism looks at two lines that make a '+' or an 'x', one line may appear sharp while the other is blurred but they cannot both be sharp at the same time. We can usually correct astigmatism using glasses that have a 'cylinder' lens in them. A small amount of astigmatism may be normal (depending on the child's age) but significant astigmatism needs to be corrected with glasses.

Does my Child Need Glasses (Spectacles)?

We do not prescribe glasses without a good reason. In most cases, we want the glasses to be worn 'full time', which means 'almost all the time that the child is awake'. (Children can take off glasses for activities such as 'soft play' and swimming.) Until a child is around the age of 14 years, the brain may still be developing some skills that depend on vision, so for most children, it may be helpful to continue full-time wear of glasses, at least until this age. After the age of 14 years, the glasses are usually simply worn as much they are needed for clear comfortable vision (which usually means 'full time'). Before the age of around 14 months, we may not prescribe glasses for small amounts of myopia, as most of the child's interest will be in objects and people less than 1 metre away.

How Long will it take for my Child to get Used to Wearing Glasses?

Some children do not like wearing glasses. You can read more about this in the leaflet on glasses for children.

A child with myopia may have clear vision for near objects without making the normal focusing effort required for this. When the child wears glasses, it may take a few weeks for the focusing muscles to build up their strength. Wearing glasses may also change the relationship between focusing effort (accommodation) and the normal inward turning of the eyes for near vision (convergence). For these reasons, it might take the child a several weeks to get used to the glasses. However, usually, this is not a problem.

Will the Myopia Progress (get worse)?

Myopia usually increases during childhood and youth. It commonly stops increasing around the age of 21, but sometimes continues to progress until around the age of 40.

Does Wearing Glasses for Myopia Cause the Myopia to Progress (get worse)?

No. There is no advantage in trying to avoid wearing glasses for myopia.

My Child has Myopia but can Read Clearly Without Glasses. What should they do?

There is no advantage in people with myopia reading without glasses. If they do so, they are turning in their eyes (converging) for near vision, but they are making less than the 'normal' amount of focusing effort (accommodation). The focusing muscles could

become lazy, and the normal link between turning in and focusing could be strained. Although this may not cause significant harm, it is not recommended.

Can Myopia Cause Other Eye Problems in the Long Term?

There are some eye conditions that are more common in people with myopia, but these conditions are uncommon in children. For example, the more myopia people have, the greater the risk (over their lifetime) of retinal detachment. (For this reason, people with myopia should avoid sports such as boxing.) There is also a higher risk of degeneration of the central retina (myopic macular degeneration) especially in adults with high myopia. There is also an increased risk of cataract, glaucoma and squint (strabismus) in adult life, but these may be more easily treated. Unfortunately, wearing glasses or contact lenses does not reduce these risks.

What Simple Things Can Be Done to Help? ('Visual Hygiene').

The benefit of being outdoors may be due to daylight being brighter than artificial light. Some experts have recommended that children spend at least 90 minutes per day outdoors. It may also help to have quite bright electric lighting in the rooms where the child spends significant amounts of time. Using bulbs with 'daylight' colour rather than 'warm white' has been suggested. This idea is not proven to work but some families may want to try it. However, in the evening, when the child is preparing for sleep, a more gentle 'warm white' light may be better.

Another 'visual hygiene' idea is that people should not hold books or screens (such as a 'tablet') closer to their eyes than the distance from their elbows to their eyes. This is particularly important if people read books in bed or use mobile phones a lot. Using a desk-top computer is less of a concern as the screen is generally much further away.

Visual hygiene ideas may be more relevant for children under the age of 12. The evidence for some of these ideas is limited, however, when possible, children at primary school should be outdoors during their mid-morning and lunch breaks.

What Optical Treatments Can Slow the Progression of Myopia?

There is no treatment available on the NHS at this time. Many community optometrists are providing 'Myopia Management' treatments, but they are fairly expensive. Wearing special daytime contact lenses, or special glasses, appears to have a moderate benefit in slowing down the progression of myopia. These treatments work by making the centre of the vision fairly sharp, while deliberately making the peripheral vision (vision away from the centre) out of focus.

How Long are these Myopia Management Treatments Needed For?

It may be difficult to know how long to continue a treatment, or how by much the myopia will progress when the treatment is stopped. However, some studies appear to show that benefit may continue during treatment that lasts at least six years. They also appear to show that, if treatment is stopped, the rate of progression of the myopia goes back to the expected rate for untreated eyes. People often ask if the treatment is working for their child. It is difficult to be certain about this because, for the individual child, one does not know for sure how much the myopia would have progressed if it had not been treated. We do not expect these treatments to work for every child. In practice, treatment is often continued until the late teens.

Are There Disadvantages to these Myopia Management Treatments?

The special glasses have DIMS lenses (Defocus Incorporated Multiple Segments), which make the vision blurred unless one looks through the centre of the lenses. This means children may have to turn their head rather than their eyes to see to the side, which they may not like. We do not know if there are any disadvantages in reducing the amount of eye movements in this way. The vision with the special contact lenses may not be quite as sharp as the vision with ordinary contact lenses. Some of the general disadvantages of contact lenses are described later in this leaflet.

Another possible treatment for myopia is orthokeratology ('ortho-k'). This uses a special type of contact lens that is worn during sleep. This may increase the risk of serious infection.

The most important issue is not how fast the myopia is progressing, but what degree of myopia the person will have in adult life. At the moment, we know very little about the long-term results or safety of Myopia Management treatments. These treatments do not stop people needing glasses (or contact lenses) and will not take away all the risks of problems due to myopia.

Are there Alternatives to Optical Myopia Management Treatments?

It is possible to copy the effect of these treatments - at least for limited periods of time. This can be done when the child is reading while seated at a table. The book is placed on a cookery book stand (desk easel) and then this is placed on top of a pile of books (or shoe boxes) on the table. (A music stand is an alternative.) The book should be raised at least as high as the eyes of the child when they are seated. Bright lighting is important. The idea is that the child will see the book clearly, but most of the rest of the vision will be blurred, as it 'comes from the far side of the room'. You can do the same

thing with a lap-top computer (or ‘tablet’ or iPad) although a separate keyboard and mouse might be needed on the table-top. This idea is not proven to work, but some families may want to try it, particularly if the child is a keen reader.

What about using Eye Drops to Reduce Myopia Progression?

In research studies done in East Asian countries, treatment with an eye drop appears to work. However, the respected PEDIG study in the USA showed no benefit. Studies have used eye drops of different strengths, and we are waiting for the results of more studies.

What about Ordinary Contact Lenses?

In general, contact lenses are an option that the family needs to pay for at their community opticians. Some older children prefer to wear contact lenses instead of glasses, for example, while playing sport. However, children and parents need to understand the risks of infection and the need for very careful hygiene. Those who wear contact lenses should keep a suitable pair of glasses available to wear during any periods when they need to stop wearing the contact lenses. Contact lenses can correct astigmatism, but this is not always successful.

What about Laser for Short Sight?

In general, refractive surgery, such as the LASIK laser treatment, is not available on the NHS. It is avoided before the age of 21, because the myopia must be stable before the treatment. Even then, some eyes are not suitable for treatment. Even if the myopia is corrected, the risk of problems such as macular degeneration and retinal detachment remains.

Name of Child	Date
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Reasons for glasses being prescribed:

- ☐ Myopia
- ☐ Anisometropia
- ☐ Astigmatism
- ☐ As part of the treatment for amblyopia (lazy eye).
- ☐ To give some physical protection when there is only one good eye.

If your symptoms or condition worsens, or if you are concerned about anything, please call your GP, 111, or 999.

Patient Experience

We know that being admitted to hospital can be a difficult and unsettling time for you and your loved ones. If you have any questions or concerns, please do speak with a member of staff on the ward or in the relevant department who will do their best to answer your questions and reassure you.

Feedback

Feedback is really important and useful to us – it can tell us where we are working well and where improvements can be made. There are lots of ways you can share your experience with us including completing our Friends and Family Test – cards are available and can be posted on all wards, departments and clinics at our hospitals. We value your comments and feedback and thank you for taking the time to share this with us.

Patient Advice and Liaison Service (PALS)

If you have any concerns or questions about your care, we advise you to talk with the nurse in charge or the department manager in the first instance as they are best placed to answer any questions or resolve concerns quickly. If the relevant member of staff is unable to help resolve your concern, you can contact the PALS Team. We offer informal help, advice or support about any aspect of hospital services & experiences.

Our PALS team will liaise with the various departments in our hospitals on your behalf, if you feel unable to do so, to resolve your problems and where appropriate refer to outside help.

If you are still unhappy you can contact the Complaints Department, who can investigate your concerns. You can make a complaint orally, electronically or in writing and we can advise and guide you through the complaints procedure.

How to contact PALS:

Telephone Patient Services: 0300 123 1732 or via email at: wah-tr.PALS@nhs.net

Opening times:

The PALS telephone lines are open Monday to Friday from 8.30am to 4.00pm. Please be aware that you may need to leave a voicemail message, but we aim to return your call within one working day.

If you are unable to understand this leaflet, please communicate with a member of staff.