THE COLLEGE OF OPTOMETRISTS

Myopia and myopia management

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Overview

What is myopia?

Myopia is also known as being short-sighted or near-sighted. If you are short-sighted you have problems seeing things in the distance clearly, but can see things that are close to you. There are different degrees of short-sightedness. Myopia is often due to the eye being slightly too long (from the front to the back). To have clear vision, light must focus directly on the retina. The retina is the light sensitive tissue at the back of the eye. In myopia, light focuses in front of the retina, so that distance vision is blurry.

The visual symptoms can be corrected using standard glasses or contact lenses, but they do not slow down how quickly myopia develops. Some treatments with specially designed glasses or contact lenses (or both), may help slow down myopia. This is known as myopia management. However, they do not stop myopia from developing in the first place. More research is needed to understand the long-term results.

Who is affected by myopia?

Around a third of people in the UK are myopic. The condition usually starts in childhood (between six and 13 years of age) and tends to get worse until the eye has stopped growing. Myopia can also develop in younger children and adults. People are more likely to become myopic if their parents are also myopic.

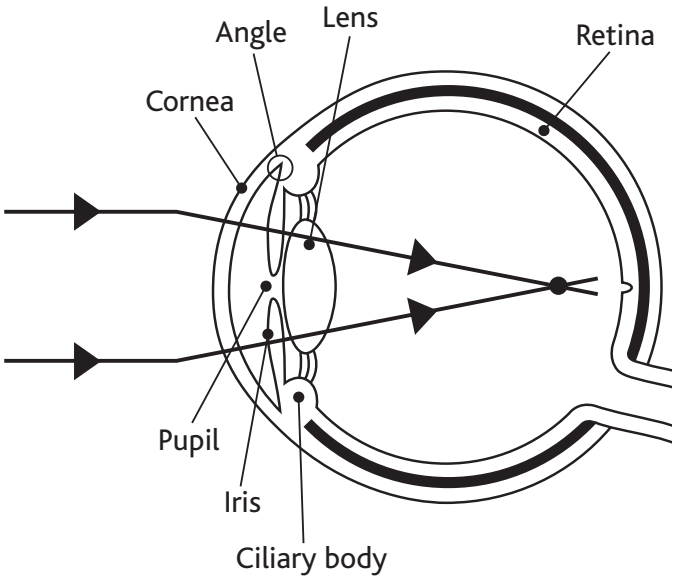
What are the symptoms of myopia?

If your child is myopic, they will have problems seeing things in the distance clearly without glasses or contact lenses. But they will often be able to see things that are close to them. This means your child might have to move closer or squint (narrow their eyelids) to see this clearly. There are varying degrees of myopia and your optometrist can detect it during a sight test.

What causes myopia?

Long periods of reading and screen use (phones, tablets, laptops and computers) may have an impact on myopia development, but the evidence is not strong and we do not fully understand why this happens. Spending time on these activities might mean your child will spend less time outdoors, which we know can help prevent or delay myopia developing.

A diagram of myopia, with light focusing in front of the retina.



We know that the following things may also make it more likely that a child will become myopic:

- having a parent with myopia
- East Asian ethnic origin
- spending limited time outside.

Can myopia be prevented?

Myopia management treatments aim to slow myopia development but don't prevent myopia from developing in the first place.

Research shows that spending more time outdoors may help prevent or delay myopia from developing in children, especially if they are at risk of developing it. Spending time outdoors may also help children who already have myopia by slowing its development, but the evidence for this is not strong.

Long periods of reading and screen use may affect how myopia develops. Researchers do not fully understand why this happens. Spending more time reading or using a screen might mean your child will spend less time outdoors.

How is myopia treated?

The blurred vision in myopia is usually easy to correct with standard glasses or contact lenses (or both). Some adults with myopia may have laser surgery to correct the blurred vision. There are some treatments that may also slow down myopia during childhood. This is called myopia management.

How myopic may my child become?

The exact causes of myopia are not fully understood. This means it is difficult to predict accurately how myopic any child may become in the future. If a child develops myopia before nine years old this may mean they are more likely to develop a higher level of myopia. If a person has a high level of myopia, they will be at a slightly greater risk of serious eye conditions later in life compared to people with normal vision. These conditions include retinal detachment, glaucoma and myopic retinal degeneration. These conditions can lead to sight loss. But most cases can be treated and the risk of developing these conditions is small.

Can I reduce how myopic my child will become?

Trying to slow down how quickly myopia gets worse is called myopia management. Some treatments have been developed for this, including specially designed contact lenses or glasses.

If a child becomes myopic before nine years old, this may mean they are more likely to develop a high level of myopia and will be at a slightly greater risk of serious eye conditions later in life.

Current evidence suggests that using special contact lenses or glasses may reduce progression of the level of myopia by around 0.50D - 0.75D (D = dioptre; unit of lens power) on average compared with using standard glasses and contact lenses. The reduction in any individual may be lower or higher than this and is usually seen over one to three years, but most of this effect happens early on during treatment. Treatment may need to be continued to maintain this reduction.

If myopia management is successful, this may mean your child grows up with a lower level of myopia than they would have had without treatment. This means that:

- they may not depend on their glasses as much as they would otherwise have had to
- the prescription for their glasses will be lower, and
- their glasses will be thinner and lighter.

Myopia management may reduce the risk of your child developing myopia-related eye problems in adulthood, but it will not take away this risk altogether. Being less myopic may mean your child is slightly less likely to be affected by serious eye conditions in the future, but we do not yet have enough evidence to be sure of this. Although a lot of research has already taken place, it will take many more years before we fully understand how successful myopia management can be. This includes whether myopia will start to get worse again after the treatment has stopped.

What are the options for myopia management?

There are two main treatments to try to reduce the progression of myopia:

- specially designed glasses or
- specially designed contact lenses.

These treatments work by changing how light is focussed on different parts of the retina while providing clear vision.

Glasses

There are specially designed glasses for myopia management. They look the same as standard glasses and your child would wear these in a similar way.

Contact lenses

There are two types of contact lenses which may be used to manage myopia:

- Soft contact lenses. Your child would wear these in a similar way to standard contact lenses. Their vision may be slightly less clear compared to traditional contact lenses.
- Orthokeratology (Ortho-K) or corneal-reshaping lenses. Your child would be fitted with specially designed rigid gas- permeable (RGP) lenses. They would wear these lenses overnight to alter the shape of the front of the eye (cornea).

Is one treatment more effective than another?

Based on current research, orthokeratology lenses are the most effective at slowing down the growth of the eye. Myopia management glasses and myopia management contact lenses have similar results in terms of reducing the level of myopia.

Myopia management may reduce the risk of your child developing myopia-related eye problems in adulthood, but it will not take away this risk altogether.

What age can my child start myopia management treatment?

There is no minimum age when myopia management treatment can be started. However, for contact lens and orthokeratology treatments your child needs to be old enough to be able to carefully use and look after their lenses. Your optometrist will show them how.

Is myopia management safe?

Wearing myopia management glasses do not have any more risks than wearing standard glasses.

The risks of wearing contact lenses to manage myopia are similar to the risks of wearing standard contact lenses. Some people experience mild discomfort and occasional blurred vision.

With all types of contact lenses there is also a low risk of serious complications, such as corneal infections, that may result in sight loss. There is a higher risk of complications associated with wearing contact lenses overnight.

Orthokeratology lenses are more likely to cause discomfort, particularly in children.

If your child wears any contact lenses, it is important that they follow your optometrist's advice about hygiene and caring for the lenses to prevent complications. It is also important that they have regular contact lens check-ups. Children can be just as good as adults at using contact lenses.

Common questions

What are the advantages and disadvantages of myopia management?

Advantages	Disadvantages
• Myopia management may slow down the rate at which myopia develops compared with standard vision correction. • There may be a lower risk of myopia-related eye problems later in life. • Lower levels of myopia means they may depend less on their glasses or contact lenses. • Lower levels of myopia may mean glasses are thinner and lighter.	• Some people's vision may be slightly less clear during treatment. • There is a risk of complications from wearing contact lenses. • You have to pay for myopia management treatments as they are not available on the NHS in any part of the UK. • Myopia management glasses and contact lenses are more expensive than standard glasses or contact lenses.

The evidence does not currently tell us whether the long-term benefits of myopia management outweigh the risks of treatment. Despite this, children with myopia who are being considered for standard glasses or contact lenses could also be considered for myopia-management treatments.

Will my child still need to wear glasses or contact lenses after myopia management?

It is very likely that your child will still need to wear glasses or contact lenses even if the treatment to manage their myopia has been successful. However, they are likely to have a lower level of myopia than they may have had without myopia management.

How will I know whether myopia management is working?

Your child's optometrist should discuss how they plan to monitor how well the treatment is working depending on your child's age. They may measure the growth of their eye and the level of myopia to check progression. They may use a calculator to predict your child's expected level of myopia and assess the reduction in the development of myopia. However, it is not possible to know for certain how much their myopia development has reduced and how successful their treatment has been.

Your child may not respond to myopia management treatment as expected. They may need to change to a different treatment, or try a combination of treatments if the first choice doesn't work.

When will my child be able to stop using myopia management contact lenses?

There is not yet enough evidence from research to provide clear guidance on when and how to end the treatment. Experts and health professionals currently believe that children should stop using myopia management in their late teens or when the level of myopia stabilises. Your child may need to continue to have treatment, or they may need to restart their treatment if their myopia starts to get worse again.

Will myopia management prevent my child from losing their sight in adulthood?

There is limited evidence about the long-term results of myopia management. Myopia management may reduce the risk of your child having eye problems as a result of high myopia later in life. However, it is very likely that there will still be some risk of myopia-related eye problems in the future. It is not possible to remove the risk completely.

Does playing outdoors affect myopia in children?

Spending time outdoors does appear to help prevent or delay myopia in children who are at higher risk of developing it. It may also encourage an active lifestyle, which is good for general health.

Does using a screen affect myopia in children?

It is not clear whether near activities (such as reading or using a screen or mobile device) are associated with myopia development. Some studies show that the length of time your child spends doing near activities may be linked to myopia development while others show that reducing time spent on near activities does not appear to reduce myopia development or rate of progression.

However, spending time on these activities might mean your child will spend less time outdoors, and we know that time spent outdoors can help prevent myopia. Taking regular breaks and reducing time spent on non-essential screen use or near activities can also help keep the eyes feel comfortable.

What happens if I choose not to have myopia management treatment?

Your child will still be prescribed traditional glasses or contact lenses if they are diagnosed with myopia. These will improve how well your child can see, but will not slow myopia development. Your child may be at a slightly higher risk of being affected by conditions that can lead to sight loss later in life compared to people with normal vision. But these conditions can be treated and the risk of developing these conditions is small.

I can't afford myopia management treatment - are there cheaper options to treat my child?

Myopia management is not currently funded by the NHS in any part of the UK. That means you have to pay for it. Myopia management treatments are more expensive than traditional glasses or contact lenses.

If you have any concerns about the health of your eyes, please visit your local optometrist. Optometrists are eye health specialists.

This information should not replace advice that your optometrist or other relevant health professional gives you.

For more information, please talk to your local optometrist.

If you have any concerns about the health of your eyes, please visit your local optometrist. Optometrists are eye health specialists. An eye examination is a vital health check and should be part of everyone's regular health care. Visit **lookafteryoureyes.org** for clear and helpful information on vision and eye health issues and keeping your eyes healthy.

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