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Myopia and Myopia Management

What is myopia?

Myopia is the medical word for short-sightedness. Short-sighted people usually have good near vision but need help from spectacles or contact lenses to see clearly in the distance (white-board, TV, cinema etc).

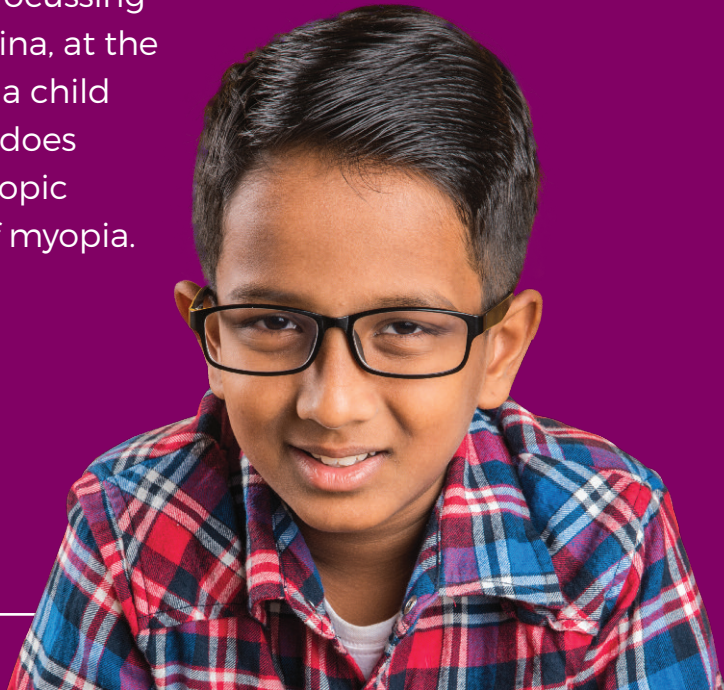
A myopic eye is usually longer from front-to-back than normal eyes meaning that light focuses in front of the retina, rather than focussing clearly onto the retina, at the back of the eye. As a child naturally grows, so does their eye, and if myopic so does the level of myopia.

Who is affected?

About 1 in every 3 people in the UK are myopic but that number is rising year on year. Myopia usually begins in childhood (6-13 years) and tends to worsen until the child stops growing (18-21 years). In the UK, the number of myopic children between 10-16 years of age has more than doubled over the last 50 years and children are becoming myopic at a younger age.

How is it treated?

Spectacles and contact lenses (or laser surgery for adults), help myopic eyes to see clearly. Negative or minus (-) powered lenses make the image reaching the retina clear, but do not prevent the myopia worsening as the child grows.



How myopic will my child become?

The exact cause of myopia and myopia progression is complex, so it is difficult to predict how myopic a child might become but research has shown that all the following increase the likelihood of a child becoming myopic and the myopia worsening:



Having one or both parents with myopia.



Spending more time indoors and less outdoors.



Spending too much time viewing close objects (eg phones, tablets etc).



The younger the child is when they become myopic, the greater the final level of adult myopia is likely to be. Becoming myopic at an early age increases the risk of 'high myopia' where myopia is -5.00 or more. If a person has a 'high myopia', they are at greater risk of developing a serious sight threatening condition later in life such as retinal detachment, glaucoma or macular degeneration.

A calculator is available to help assess the risk of your child becoming myopic: www.mykidsvision.org/en-us

A table showing the increased risk of a myope suffering from a serious sight threatening eye condition later in life and how the risk increases with the amount of myopia¹:

Myopia	Glaucoma	Cataract	Retinal Detachment	Myopic Macular Degeneration
-1.00 to -3.00	2x	2x	3x	2x
-3.00 to -5.00	3x	3x	9x	10x
-5.00 to -7.00>	5x	5x	21x	41x
>-7.00			44x	127x

This table demonstrates that when we are thinking about the adult complications connected to myopia, ANY amount of INCREASE in myopia makes a difference, so EVERY amount PREVENTED is beneficial.

How does spending excessive amounts of time looking at near object tasks and not spending time outdoors, increase myopia?

In this digital age, children are spending much more time on computers, screens, mobile phones and tablets than past generations. The distance they hold things, especially mobile phones, is generally much closer than they would usually hold a book and the length of time they concentrate on it for is much longer. It is difficult for the eye to maintain precise focus when being used in this way and the lack of a sharply focussed image encourages the eye to grow longer and the eye to become myopic.

The opposite happens when children are outdoors, where the eyes are likely to be more relaxed as they are generally looking further away rather than at near objects. Also, research shows that being in bright light, just like we find when outdoors, releases dopamine which slows eye-growth and might make it less likely that a child will become myopic or that myopia will worsen.

Both looking into the distance with relaxed eyes and being in brighter light happen naturally when a child is outdoors and both of these factors make myopia progression less likely, so spending more time outdoors should be encouraged.

Increasing cases and levels of Myopia appears to be a result of 'modern' lifestyles.



Can I reduce the progression of my child's myopia?

Trying to slow the progression of myopia is called Myopia Management and several methods have been developed. Research shows that the best results are found when specially developed spectacle or contact lenses are used, with results showing between 60-70% reduction in myopia progression.

Some increase in myopia is unavoidable. The purpose of myopia management is to slow-down the worsening of a child's myopia so that as an adult, they are less myopic than they would have been if we had done nothing.

Being less myopic means:

- less chance of developing adult sight threatening conditions.
- spectacle lens powers in adulthood being lower, meaning lenses are thinner and lighter and less dependence on spectacle wear for emergencies and sport.

What are the treatment options?

Changes in lifestyle

If your child is already myopic or scores as a high risk for myopia on the calculator, at the very least you should encourage them to:

- Spend more time outdoors.
- Limit 'screen time'.
- Hold screens further away from their face and sit further away from the television.
- Remove spectacles when doing near activities for long periods.



Spectacle lenses

Normal spectacle lenses only focus a clear image onto the centre of the retina. Specialist myopia management lenses maintain a clear image across the whole retina by having a centre for distance viewing surrounded by hundreds of tiny lenslets which also keep the image clear on the outer part of the retina. Having the whole image in focus across the retina has been shown to remove the driver for excessive eye growth.

Only a registered optician can supply these lenses to children. Cosmetically the lenses appear normal and accurate fitting will ensure the child is always looking through the correct part of the lens. These lenses have been shown to slow myopia progression by over 60% but they are not currently funded by the NHS.

Contact lenses

- Myopia management contact lenses work on the same basis as the myopia management spectacle lenses. Research has also shown these to slow myopia progression by over 60%.
- These lenses are daily disposable so offer the best in eye health, require minimal maintenance and so are suitable for children of all ages.

Both options are available at your local Colin Lee and Jenks practice.





Choosing no treatment

Traditional spectacles or contact lenses will be prescribed for distance vision if a child is diagnosed with myopia. The glasses or contact lenses will make your child see clearly but will not slow myopia progression. Please remember the lifestyle section previously discussed.

Is myopia management safe?

Manufacturers research shows that with the spectacle lens option 90% of children fully adapt within 3 days and 100% within one week. We will also provide a spare pair of standard single vision spectacles to be used for any activities which may risk damage being caused to the myopia management pair.

The risk of wearing contact lenses to manage myopia is the same as wearing traditional contact lenses. A mature understanding of hygiene is needed to reduce the potential risk of infection. It is important to follow advice about hygiene, caring for the contact lenses and to attend regular follow-up appointments which are included in the cost.

Although much research has already taken place and there is unanimous agreement that myopia progression can be slowed, there is currently no evidence regarding the long-term results of myopia management as the research only covers the medium term so far. This is because the children who have been through the clinical trials to prove the effectiveness of these treatments are now only young adults themselves.

Although myopia management should reduce the risk of your child developing myopia related sight loss in adulthood, it does not take away the risk altogether; simply makes it less likely. Only after a full generation of research will we know if myopia management is cost effective in reducing adult sight threatening conditions, but the evidence is overwhelming.

The current generation of children could be the last not to receive this treatment as standard procedure funded by the NHS.



Frequently asked questions

Q: Should I stop my child wearing existing glasses for myopia?

A: No. All the research shows that not wearing their existing spectacles or contact lenses, not only prevents children seeing clearly (which can have effects on education and social development) but also increases the of progression of Myopia. We would only advise that children take their glasses off when doing near tasks for long periods.

Q: Are there other management options available?

A: Researchers have used an eye drop called Atropine, other spectacle lenses like bifocals and varifocals and rigid contact lenses in clinical trials.

Atropine was found to slow the spectacle correction but the eye still continued to grow which did not reduce the risk of longer-term eye problems.

Bifocals and Varifocals were found to have low success rates of 10-20% reduction of myopia progression so were discounted as unsuccessful treatments.

Orthokeratology (OrthoK) rigid contact lenses are worn overnight to change the shape of the front of the eye during sleep, rather like a brace. They are removed in the morning so that the vision is clear in the daytime without glasses. The effect wears off during the day, so the process is repeated each night. OrthoK can only be used up to a certain degree of myopia and there are increased risks when sleeping in contact lenses. We are monitoring this option as more research becomes available.

References:

- 1 Practitioners guide to the Clinical myopia profile <https://myopiaprofile.com> table 1.
- 2 <https://bj.o.bmj.com/content/early/2021/04/01/bjophthalmol-2020-318367>
- 3 [https://www.aaojournal.org/article/S0161-6420\(21\)00326-2/fulltext](https://www.aaojournal.org/article/S0161-6420(21)00326-2/fulltext)

Further reading:

- www.myopiainstitute.org
- www.coopervision.co.uk/misight
- www.essilor.co.uk/lenses/stellest
- www.hoyavision.com/uk/vision-products/miyosmart/





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