

Myopia Management at Cameron Optometry

What is myopia?

Myopia is the medical term for short-sightedness, when the eyeball is too long or too powerful. The result is that light coming into the eye does not focus directly on the retina (the light sensitive layer at the back of the eye), but instead falls in front of it, causing objects in the distance to look blurred. Myopia is traditionally corrected by wearing spectacles or contact lenses. As the eye grows, a person typically becomes more myopic and the power of their spectacle or contact lens prescription increases. Prescriptions over -6DS are considered to be high myopia.

Is myopia becoming more common?

Yes. Myopia is expected to affect 50% of the world population by 2050. In the UK, the amount of myopia has increased from 10% to 23% of children in the past 50 years.

Why do people develop myopia?

Research suggests that a person's genetics, lifestyle and their day-to-day environment all play a part. People who spend more time doing tasks at a close distance such as working on computers and reading, and those who spend less time outdoors seem more likely to develop myopia. If both parents have myopia then there is a 46% chance that a child will develop it, 31% with one parent and 22% if no parents are myopic. Females have a greater gender tendency for myopia than males.

Does myopia get worse during childhood?

Yes. Generally, once you have myopia your spectacle prescription gets greater over time, in particular during childhood as the eye grows. The key years of change in myopia are between six and 17 years old with the largest change in prescription typically happening at around age seven to eight years and changes getting less as you get older. Generally, myopic children wearing traditional glasses or contact lenses will continue to increase in myopia by approximately 0.50 to 1.00 D (units of measurement) per year. We can use these figures to calculate what we expect a child's prescription level to be by the time they are in their late teens when change generally starts to slow or stop. Many people develop myopia later in life, however if a child develops myopia, they are at risk of their vision deteriorating much more quickly and for many more years leading to a higher eventual prescription.

Why are higher levels of myopia a problem?

A higher prescription is not only an inconvenience causing poorer vision without glasses or contact lenses but all myopia and especially higher prescriptions (over -6.00DS) are linked to an increased risk of developing eye diseases such as glaucoma, retinal detachment, myopic macular degeneration and cataract in later life. Each dioptre increase in myopia results in 67% increased risk of myopic macular degeneration.

You can use this simulator to get an idea of what your close and distance vision would look like without spectacles or contact lenses as your prescription gets higher.

<https://coopervision.co.uk/eye-health-and-vision/childhood-short-sightedness/myopia-simulator>

What is myopia management?

Myopia management aims to slow down the progression of myopia in children and young adults through lifestyle changes, the use of specialised contact lenses, eye drops (not available in the UK) and specially designed spectacle lenses. It is unlikely that myopia management will stop the progression of myopia completely and the "average" child will still have some progression of myopia even with myopia management.

At Cameron Optometry our expertise in contact lenses and spectacle lenses, allows us to provide the most advanced options available based on up to date research. We have now been successfully fitting children with contact lenses for myopia management since 2015. Research has found the results of myopia management using specialised contact lenses, to be effective, with recent studies showing that a 59% reduction in the progression of myopia is achievable and that contact lenses are tolerated very well by children. An example of this would be a child who comes for an eye examination with a prescription of -2.00DS. If we calculate that they are likely to reach -6.00DS by the time they are 17 then by using myopia management contact lenses we would hope that their final prescription would end up as -4.25DS. Some children may get an even better result than this and some may find the lenses to be less effective.

The results of a large trial on soft contact lenses for myopia management (MiSight) has found that over a three year period half of the eyes that were studied had no change in prescription and over six years a quarter of eyes had no change. *

*The children in this study were aged between eight to 12 years with a starting prescription of between 0.50 and 4.00DS with astigmatism of <0.75DC.



What are the treatment options?

Contact lenses

Myopia management contact lenses are designed to firstly correct your child's vision so they can see well and secondly to slow the process of eyeball growth, with the aim of reducing how short sighted they eventually become. The aim of treatment is to slow the rate of decline by around 50%. Myopia management contact lenses cannot reduce your child's prescription from the point at which they start with the contact lenses.

There are two contact lens options - either soft daily disposable multi focal contact lenses (MiSight) that are worn during the day or specially designed gas permeable lenses Orthokeratology lenses (OK) which are worn when asleep.

MiSight lenses have two powers in them and are thought to slow the progression of myopia in children by focusing light at the centre of the retina for good vision but creating defocus on the surrounding parts of the retina to slow the eye's desire to grow.

OK lenses are rigid gas permeable contact lenses worn overnight to reduce myopia by temporarily and reversibly reshaping the cornea (front surface of the eye). These contact lenses are taken out in the morning so that the wearer can have clear vision all day without having to wear spectacles or contact lenses and are great for people who swim or have an active lifestyle. These are thought to slow the progression of myopia in the same way as the soft contact lenses. Patients get used to them very quickly and their sleep is rarely affected by them.

Spectacle lenses

In early 2021, the first spectacle lens for myopia management became available in the UK. The Hoya MiyoSmart lens works very similarly to the contact lenses in giving clear vision through the centre of the lens and a variation in the power of the lens away from the centre to create defocus on the peripheral retina helping reduce the eyes desire to grow. The results of a two year study suggest that these spectacles are as effective as the contact lenses in slowing the progression of myopia. Although the initial vision through these spectacles will feel different to previous spectacles your child might have worn this is expected to settle within two weeks.

Eye drops

Atropine is a prescription eye drop used to temporarily open the pupil and limit the ability to focus. If it is used at a very low concentration it does not cause any visual difficulties with focussing but has been found to slow the progression of myopia. It is thought to do this by interaction with some of the receptors in the eye that control eye growth. Atropine is not currently available for this use in the UK however a three-year trial started in 2019 which may lead the way to availability in the future.

What is the best age to start myopia management?

The earlier the better. Myopia gets worse most quickly in younger eyes levelling off by late teens/ early adulthood. To get the best overall reduction in myopia children should start myopia management with spectacle lenses as soon as they become myopic and with contact lenses as soon as the parents, child and optometrist think they are ready. Research shows that myopia management still slows the rate of change of prescription in older children so it is worth using myopia management at any age while the prescription is still changing.

Is myopia management a treatment for life?

The eye does not continue to change shape for your whole life and so by late teens or early adulthood most people will find the myopia naturally stops progressing. At this stage spectacles or traditional contact lenses will become appropriate for your child's visual correction.

What are the benefits of myopia management?

1: Good vision

- As with non-myopia management contact lenses, soft daily disposable contact lenses offer clear vision without having to wear spectacles during the day.
- OK lenses offer clear vision without having to wear spectacles or contact lenses during the day. Some parents also like that they can oversee contact lens wear since lenses are only worn at night and not during the school day.

MiyoSmart spectacles offer good vision for those who would

- rather not wear contact lenses or for times where you are resting your eyes from your contact lenses.

2: Reduced prescription power

- As part of the eye examination we will use current evidence to predict how short sighted your child might become, the aim of myopia management is to reduce this final prescription by on average about 50%. We appreciate the effect for each individual person could be higher or lower than this and the long-term effectiveness is not fully understood but is now being researched.

- A reduced prescription means your child will have better vision without their contact lenses or spectacles on and will need thinner and lighter lenses in their spectacles.

3: Eye health

- By reducing the prescription then we can also assume that the growth of the eyeball has been reduced, although we do not measure this directly. This reduces the risk of eye complications such as retinal detachment, myopic macular disease, cataracts and glaucoma in later life. Each dioptre less myopia is associated with reduced risks of eye disease in later life. So if someone has a prescription of -5.00DS they are 80% less likely to develop problems with the retina than someone who is -8.00DS.
- Conclusive evidence of reduced rates of eye disease will unfortunately not be around for decades until today's myopic children reach later life.

Are there any disadvantages to wearing myopia management contact lenses?

Risks of eye infections and dry eyes:

- Like all lens wear there are potential risks of infection but these are hugely reduced by good compliance to the lens care advice you and your child are given. The risks of wearing myopia control contact lenses are the same as wearing ordinary contact lenses.

- The most significant risk associated with contact lenses is microbial keratitis, a bacterial infection of the clear front of the eye (the cornea). In a small percentage of cases this can result in the vision becoming permanently worse in the eye. Each year 13-15 people out of 10,000 contact lens wearers will develop this type of eye infection. The rate of microbial keratitis for children eight to 12 years of age wearing soft contact lenses appears to be less than that of adults or teenagers, and we think this is because they have adults supporting them in caring for their contact lenses. The risk of overnight wear of contact lenses is higher than daily wear.
- Other risks associated with the use of contact lenses include other types of less serious eye infections or inflammation (swelling) or scratches of the eye. Most of these complications do not result in any long-term damage to the eye.
- Symptoms of dry eyes can be made worse in response to contact lenses but your optometrist will monitor the eye surface and give appropriate advice on lens wear or additional lubrication if required.

Will the myopia come back if I stop using the contact lenses or MiyoSmart spectacles?

Again we do not have strong evidence for this as this has not been tested in trials, however because the contact lenses work to restrict the growth of the eye there should not be a rebound effect once wear of the lenses has stopped, particularly if they are worn until the late teenage years when the eyes typically stop growing. It may however be possible that myopia continues to progress from the point at which it stopped once lens wear ceases. Research trials to look into the effects of stopping the lenses after years of lens wear have now started.

How often will my child visit the optometrists?

If wearing contact lenses there may be a number of appointments required to establish the best lenses for your child and to assess their suitability for lens wear. After the initial appointment, they will have a lens collection appointment at which they will see the optometrist and also a clinical assistant who is available to answer any contact lens questions you or your child have and will take all the time they need to ensure they can handle the lenses safely and confidently. Your child will return to the practice for a review appointment with your optometrist two weeks later.

If you are trialing overnight orthokeratology lenses for myopia management then you will need to have a number of appointments during the first couple of weeks of the trial. This includes an initial fitting appointment, a contact lens collection appointment, then appointments on day one, day five and day fourteen of the trial.

Your child will be expected to attend for a contact lens or MiyoSmart spectacle check on at least a six monthly basis to monitor their progress.

Like all new skills, learning to insert, remove and care for contact lenses can take time to master. We find that success with contact lenses often hinges on the confidence of the person wearing them and with that in mind we do not like to issue the contact lenses to take home until you, your child and us are happy that you can manage them. It is not uncommon for this to take a few appointments so do not be disheartened if you do not take the lenses home on the first day.

What are the costs of Myopia Management?

Due to the complexity of the lenses and the importance of closely monitoring your child at regular intervals, we only supply myopia control spectacle and contact lenses as part of our comprehensive Vision+ membership programme. The monthly Vision+ payment covers all appointments, examinations, tests, scans and gives you a host of other benefits as well.

MiyoSmart spectacle lenses

Myopia management with MiyoSmart spectacle lenses costs £35 per month. This includes Vision+ membership and a new pair of spectacle lenses each year.

MiSight daily disposable contact lenses

For myopia management with daily disposable soft lenses the price is £48.98 per month. This includes Vision+ membership and all contact lenses required. No cleaning solutions are required. If you wish to have MiyoSmart spectacle lenses in addition to soft contact lenses then this will add £20 per month to the monthly cost, taking it to a total of £68.98 per month.

Orthokeratology

Myopia management with orthokeratology also costs £48.98 per month. This includes Vision+ membership, replacement contact lenses every six months, replacement lenses for any lost/broken lenses and contact lens cleaning solutions. There is an initial fee for orthokeratology of £99-£150 to cover the cost of ordering these bespoke lenses and the increased amount of initial appointments required.

You will receive a 10% discount on these costs if you have another family with Vision+ membership.

We hope this answers some of your questions, however we're sure you will have more, so please get in touch to discuss further.

We base our myopia management scheme on guidance by the International Myopia Institute. In 2019 the institute gathered together the leading figures in research into myopia and trawled through all the research on myopia to produce seven papers. If you are interested in further reading into myopia you can access these papers at:

<https://myopiainstitute.org/imi-whitepapers>



**CAMERON
OPTOMETRY**
EDINBURGH

5 St Vincent Street, Edinburgh, EH3 6SW · 0131 225 2235
vision@cameronoptom.com