



GUIDANCE FOR OPTOMETRISTS

Myopia Management

Prevalence of myopia

Myopia is a global problem. By 2050, it is predicted that half the world's population will have myopia, a fifth of whom will be at high risk of sight threatening ocular pathology as a result.

In the UK, the prevalence of myopia in children aged between 10-16 years has more than doubled over the last 50 years, and children are becoming myopic at a younger age. Children with parents with myopia are more likely to be myopic than those without.

New options for managing myopia

There are a number of options for managing myopia in the UK. These are:

- multi-focal contact lenses
- orthokeratology.

Outside the UK, low dose atropine is, and myopia control ophthalmic spectacle lenses are, available. Low dose atropine for myopia control is not licensed in the UK.

Many of the multi-focal contact lenses and orthokeratology lenses currently available are not specifically designed for myopia control, so their use is off-label. There are now a number of contact lenses designed for myopia control available, which has the required medical device approval. Other orthokeratology and contact lenses designed for use in managing myopia are likely to become available in the near future.

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Effectiveness

There is evidence that the progression of myopia may be slowed by around 50% across different intervention strategies, but there are a number of important things that the current evidence does not explain. The College's view is that the evidence is not sufficient to recommend the wide scale roll out of any intervention, or combination of interventions. Key limitations of the current evidence include:

- There are not enough European studies, and myopia prevalence varies with ethnicity. This means that we do not know if the current evidence base relating to slowing progression would be fully relevant to children with European ancestry.
- Insufficient studies of adequate duration to fully understand the rebound effect and longer-term impact of interventions – this means we cannot assess their risk properly, or provide reliable risk/benefit evaluations for individual patients.
- There has not been enough investigation of the inter-subject variations in efficacy to enable reliable predictions to be made about which patients will benefit from a given intervention, and to what extent, or to enable us to understand why these variations in response to interventions occur.

However, new evidence is being gathered and evaluated, and the new guidelines for research in this area from the International Myopia Institute (IMI) should enable future research to address these issues.

Short-term benefits compared with traditional management

There is evidence that multifocal contact lens designs can be used to slow the progression of myopia but their efficacy ranges from 40% to 60% for 1-2 years. Similar levels of efficacy have been found for orthokeratology lenses.

Recent research on the efficacy of myopia control spectacles has also demonstrated their ability to slow myopic progression. These may become available in the UK in the near future.

Short-term risks and ways of mitigating these

The change from standard contact lenses to myopia control lenses is unlikely to introduce any significant additional risk, but there could be an increased risk of corneal infections in children and young adults, associated with wearing lenses for longer periods.

A change from spectacle or standard contact lens use to orthokeratology may carry a greater risk of serious complications, due to the over-night wear.

The transition from spectacle wearing to wearing contact lenses for myopia control may carry additional risks in terms of infection, which should be considered for each patient, and clearly explained.

Long-term benefits compared with traditional management

There is almost no evidence about long-term results of myopia management. This is an important gap in the evidence base. The College agrees with the new IMI guidelines for research that advocate for more studies with longer intervention periods, and longer follow up periods once the interventions have been discontinued. Such research is critical to our understanding of these interventions, and to assessing the long-term benefits and outcomes, as well as the possible risks and unintended consequences of their use.

Long-term risks and ways of mitigating these

As noted above, there is almost no evidence about long-term risks, or about the effect on myopia progression following cessation of treatment. We do not have the evidence we need to understand whether interventions that limit myopic progression, also influence the risks of eye health issues associated with myopia. The assumption is that limiting axial elongation and the degree of myopia will reduce the associated risks, but there is no research to investigate this as yet.

Managing myopia

The College recognises that some optometrists in the UK are already offering myopia management interventions to patients. Following our 2018 Myopia Roundtable, and after reviewing the outputs from the IMI's work, our view is that if you are already offering myopia management interventions, it is safe and ethical for you to continue to do so, provided you follow relevant guidance. You should:

- Explain clearly what the evidence shows and does not show, together with short- and long-term benefits and risks. It is important that parents and patients understand that there is currently no reliable means of determining whether an individual will benefit at all from an intervention, or to what extent they may benefit.
There is no mechanism by which it is possible to show what would have happened had the intervention not been used once it has been started. Consider how you will manage expectations.
- If you recommend an intervention, keep up-to-date with the evidence about myopia management using that treatment in particular, but also more widely. This area of the evidence base is developing rapidly. You should also discuss the option of no treatment.
- Discuss the mechanism you will use to measure outcomes. Axial length monitoring is necessary to assess progression of myopia. It is especially important if orthokeratology is being used, but is the preferred measure for monitoring and evaluating all myopia control interventions. Refractive error on its own is not considered sufficient.
- Obtain explicit consent and keep accurate records of the discussions leading to consent being given. Ensure that you understand what is involved in obtaining explicit consent.
- Have a system for reporting adverse events to track safety issues. You should aim to collect data that is capable of supporting clinical audit of this aspect of your practice, and, if possible, that could be used (with appropriate consent) to add to data sets to build the evidence base for future research.

If you are not already offering myopia management interventions, you do not have to do so. However, you should make sure that you can hold a discussion with patients and their parents about the evidence, the benefits and the risks.

What to tell patients and parents

Why opt for myopia management?

- There is evidence that people with myopia are at a higher risk of developing sight threatening eye problems later in life. By undertaking myopia control, you may be reducing your risk of developing certain eye conditions such as retinal detachment, or myopic degeneration. There is not yet any long-term evidence about whether myopia management will have the desired effect long-term.

Risk factors for becoming highly myopic

- Parents with myopia
- East Asian ethnic origin
- Myopia before the age of nine
- Spending limited time outside and being heavily engaged in activities using near vision.

General

- The evidence does not currently tell us whether the benefits outweigh costs and risks.
- It is difficult to predict whether, and to what extent, an individual would benefit from an intervention or what would have happened if no intervention had taken place.
- We do not have the evidence needed to know how intervening, even when apparently successful, will affect eye health in the longer term.

Myopia control contact lenses

- There is no increased risk from wearing myopia control lenses during the day compared with wearing conventional contact lenses.
- There could be a small increased risk of corneal infections in children and young adults, associated with wearing lenses for longer periods, or for an individual moving from spectacle wear only to contact lenses wear.
- Children wearing contact lenses need to be able to handle them hygienically, hence the need for a full contact lens fitting evaluation, and patient instruction on lens wear and care.

Orthokeratology

- Orthokeratology is a way reshaping the cornea to reduce myopia by wearing gas permeable contact lenses while asleep overnight.
- Orthokeratology may carry increased risks of serious eye health problems due to the overnight wear.

Myopia control spectacles

- These have shown promising results in clinical trials, but are not yet licensed in the UK. They are likely to become available here in the near future.

Low dose atropine

- Low dose atropine is not licensed in the UK for myopia control. The long-term effect of atropine use for myopia control is not known.
- Some trials are starting in the UK.

All interventions

- There is no evidence that myopia control lenses prevent myopia from developing.
- There is evidence that multifocal contact lens designs can be used to slow the progression of myopia but their efficacy ranges from 40% to 60% for 1 – 2 years. Similar levels of efficacy have been found for orthokeratology lenses.
- There is no reliable, good quality evidence about long-term risks or about the effect on myopia progression following cessation of any of the treatments listed above.
- Not enough research has been carried out on children of European ancestry to know if any interventions work for these children.

- There is a significant commitment and cost for patients and their parents.
- There is evidence that encouraging children to play outdoors will reduce the onset of myopia.

Resources

- Northern Ireland Childhood Errors of Refraction Study – Six Year Refractive Change among White Children and Young Adults: Evidence for Significant Increase in Myopia among White UK Children
journals.plos.org/plosone/article/comments?id=10.1371%2Fjournal.pone.0146332
- The safety of orthokeratology – a systematic review:
ncbi.nlm.nih.gov/pmc/articles/PMC4697954/
- The safety of contact lenses in children -
ncbi.nlm.nih.gov/pmc/articles/PMC5457812/
- Cochrane Library – Interventions to slow progression of myopia in children – (2011 – due for update in 2019)
cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004916.pub3/abstract

This guidance is based on the outcomes of a myopia management roundtable hosted by The College of Optometrists on the 15 June 2018. Find out more about the roundtable at college-optometrists.org/myopia-roundtable



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