



MYOPIA MANAGEMENT: THE SOONER, THE BETTER



Intervening even before risk factors present may give patients the best chance of visual success.

BY KAELEEN FRANSON, OD

Myopia management has been a hot topic for the past few years. With increased myopia education and multiple treatment options available, most optometrists have a good grasp on *how* to treat the condition, but we must also consider *when* to treat it.

Consider an older child who is increasing half a diopter or more each year. They are obviously a good candidate for myopia management, but what if they are still farsighted and have above average axial lengths and several risk factors? Or what about a 7-year-old who is plano acceptable with low risk factors?

Treating a child earlier, before the critical growth period of 8 to 12 years of age, generally has several benefits, including reduced risk for both ocular diseases and reliance on glasses and contact lenses.¹ Many parents may be hesitant to treat their child this early, but as we now know, children who develop myopia at younger ages tend to have faster progression and higher amounts of nearsightedness.¹ By identifying risk factors and pre-myopia in our youngest patients and implementing treatment sooner, we can get ahead of the pandemic-level proportions that myopia is expected to become; almost half of the global

population is expected to be myopic by 2050, with one billion having high myopia.² As clinicians, we can no longer wait for myopia to progress before we initiate therapy.

ASSESSING RISK

Identifying pre-myopia and assessing a patient's risk factors will help determine when it's necessary to start treatment early. *Pre-myopia*, as defined by the International Myopia Institute, is "a refractive state of an eye of $\leq +0.75$ D and > -0.50 D in children, where a combination of baseline refraction, age, and other quantifiable risk factors provide a sufficient likelihood of the future development of myopia to merit preventative interventions."³ A patient with pre-myopia, coupled with two or more additional risk factors, indicates that myopia control is warranted. Risk factors to look for include parental myopia, ethnicity, time spent outdoors, sleeping habits, and axial length.

Parental Myopia

A child is 1.5-times more likely to develop myopia if they have only one myopic parent and almost two-times more likely if both of their parents have myopia.⁴

Ethnicity

Patients of Eastern and Southeastern Asian descent are at higher risk for myopia development and progression than those of European or African ethnicity.⁵

Time Spent Outdoors

Children who spend approximately 2 hours outside each day have reduced risk of myopia progression.⁶

Sleeping Habits

Children who sleep less than 7 hours each night have an increased risk of myopia progression.⁷

Axial Length

Measuring axial length has become an easy and efficient way to manage myopia risk and progression in the office and, while not required, is quickly becoming a major component of myopia management. Although a child may still be hyperopic or have low myopia, having an axial length that is growing too much too quickly raises red flags. The average annual axial length growth for children is between 0.1 mm and 0.2 mm. In children who are myopic or pre-myopic, an accelerated annual growth can be seen with an average of 0.2 mm to 0.3 mm per year.⁸ By closely monitoring change in axial length, deciding when to initiate

treatment becomes easier and can help determine whether combination therapy is warranted in a child who continues to progress despite therapy.

INITIATING TREATMENT

Once risk factors and refractive error have been determined, closely monitor the patient as often as every 6 months to ensure treatment is initiated when appropriate. Educating the patient and their parents on lifestyle factors, such as spending adequate time outdoors, reducing near work to less than 2.5 hours per day, and getting proper nutrition and sleep, allows a more comprehensive management approach.

When more advanced myopia management is required, there are several treatment options to consider. Atropine is a long-standing popular option for the pre-myopic patient and those with higher amounts of astigmatism; however, recent studies have suggested reduced efficacy due to patient compliance and variation in the prescribed concentration.⁹

FDA-approved daily disposable contact lenses, such as MiSight 1 day soft contact lenses (CooperVision), which start at -0.50 D, or Acuvue Abiliti Overnight Therapeutic Lenses for Myopia Management (Johnson & Johnson Vision), which start at -0.25 D, are an option for those with

low myopia. Off-label use of multifocal contact lenses is another option, as are various orthokeratology lenses, as long as the child fits within the keratometry and manifest parameters.

In the future, myopia management may also be carried out with the use of eyeglasses such as MiyoSmart (HOYA Vision Care), Stellest (Essilor), and SightGlass (SightGlass Vision), upon approval in the United States.

KEEP UP, NOT CATCH UP

With data indicating that even low myopic refractive error increases disease risk, there is no longer a “safe” level of myopia.¹⁰ And based on today’s understanding of myopia progression, treating the low hyperope with accelerated axial length growth or the young emerging myope a few years sooner will set these patients up for the best visual outcomes. Treating myopia early or before it even begins gives future generations the best chance for good ocular health and visual success. ■

AT A GLANCE

- ▶ Almost half of the global population is expected to be myopic by 2050, with one billion having high myopia.
- ▶ Risk factors for myopia include parental myopia, ethnicity, time spent outdoors, sleeping habits, and axial length.
- ▶ By identifying risk factors and pre-myopia in our youngest patients and implementing treatment sooner, we can get ahead of the pandemic-level proportions that myopia is expected to become.

1. Chua SYL, Sabanayagam C, Cheung YB, et al. Age of onset of myopia predicts risk of high myopia in later childhood in myopic Singapore children. *Ophthalmic Physiol Opt.* 2016;36(4):388-394.
2. Holden BA, Fricke TR, Wilson DA, et al. Global prevalence of myopia and high myopia and temporal trends from 2000 through 2050. *Ophthalmology.* 2016;123(5):1036-1042.
3. Fittcroft DL, He M, Jonas JB, et al. IMI - Defining and classifying myopia: a proposed set of standards for clinical and epidemiologic studies. *Invest Ophthalmol Vis Sci.* 2019;60(3):M20-M30.
4. Jiang X, Tarczy-Hornoch K, Cotter SA, et al. Association of parental myopia with higher risk of myopia among multiethnic children before school age. *JAMA Ophthalmol.* 2020;138(5):501-509.
5. Luong TQ, Shu YH, Modjtahedi BS, et al. Racial and ethnic differences in myopia progression in a large, diverse cohort of pediatric patients. *Invest Ophthalmol Vis Sci.* 2020;61(13):20.
6. Wu PC, Tsai CL, Wu HL, Yang YH, Kuo HK. Outdoor activity during class recess reduces myopia onset and progression in school children. *Ophthalmology.* 2013;120(5):1080-1085.
7. Liu XN, Naduvilath TJ, Sankaridurg PR. Myopia and sleep in children—a systematic review. *Sleep.* 2023;46(11):zsad162.
8. Hou W, Norton TT, Hyman L, Gwiazda J. Axial elongation in myopic children and its association with myopia progression in the correction of myopia evaluation trial. *Eye Contact Lens.* 2018;44(4):248-259.
9. Repka MX, Weise KK, Chandler DL, et al. Low-dose 0.01% atropine eye drops vs placebo for myopia control: a randomized clinical trial. *JAMA Ophthalmol.* 2023;141(8):756-765.
10. Haarman AEG, Enthoven CA, Tideman JWL, Tedja MS, Verhoeven VJM, Klaver CW. The complications of myopia: a review and meta-analysis. *Invest Ophthalmol Vis Sci.* 2020;61(4):49.

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