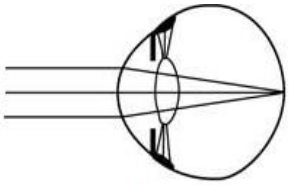
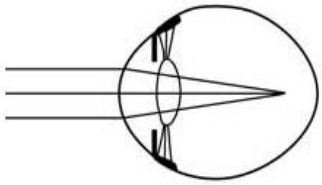
The Myopia Management Program at Achord Eye Clinic

Myopia: What Is It?



Average eye



Myopic eye

Myopia, also called nearsightedness, is a condition where near objects are clear but distant objects are blurred. Typical myopia can be diagnosed as young as 4 or 5 years old and is caused by the eye continuing to elongate after it should have stopped growing. Myopia gets worse as children get older - this is the reason why children need new glasses every year. Usually, this process stabilizes sometime after 18 years old.[1] The higher the nearsighted prescription, the higher the risk for a variety of sight-threatening eye conditions, including glaucoma, retinal detachments, and macular degeneration. After reaching prescriptions higher than -4.00 diopters, the risk is so high that it becomes almost a certainty that one of these conditions will occur at some point in a myopic individuals' lifetime.[2,3] Higher prescriptions also limit the possibilities and affect outcomes for refractive (LASIK) surgery later in life.

	How much does the risk for disease increase?		
Degree of Myopia	Retinal Detachment	Glaucoma	Macular Degeneration
< -3.00 D	3X	2X	2X
>-5.00 D	21.5X	14.4X	40X

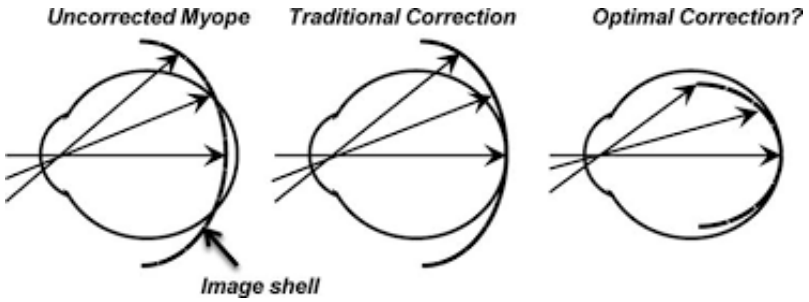
While we can fully correct the blur from myopia with standard contact lenses or glasses, slowing down this yearly increase, or progression, of myopia lowers a child's risk for these sight-threatening conditions and improves their future quality of life. Several different methods have been shown to slow myopia progression in children. These methods are:

- Multifocal Soft Contact lenses
  - Daily lenses: MiSight lenses
  - Monthly lenses: Aquaclear or Biofinity lenses
- Orthokeratology (also called Corneal Refractive Therapy or CRT)
- Low-Dose Atropine

There are no guarantees that these treatments will work for every individual, but the seriousness of these conditions warrants taking steps to prevent any possible future loss of vision.[4]

How Do Myopia Management Interventions Work?

Multifocal Soft Contact Lenses and Orthokeratology lenses appear to reduce myopia progression by about 50% per year. This means, if a patient's prescription was going to increase by 1.00 diopter in a year, wearing these lenses could slow this change to only 0.50 diopters over the course of that year. Multifocal Soft Contact lenses and Orthokeratology lenses appear to work the same way. Nearsighted patients wearing traditional glasses or contacts have clear focused vision centrally, but around the periphery these glasses and contacts push the focus of light behind the eye. This focus behind the eye has been hypothesized to create a signal for growth which triggers the eye to grow even longer. Multifocal soft contact lenses and orthokeratology both bring this peripheral focus from behind to inside the eye. Bifocal glasses work by a similar mechanism, but are only predicted to slow myopia progression by around 15-30% per year. This is likely due to the fact that bifocal lenses can only adjust the defocus in part of the eye, as opposed to 360 degrees around the eye.[5,6]



Low-dose Atropine (0.05%) dosed once a day at night has also been shown to be effective in slowing myopia progression in children, at the rate of 50% to 60%. We don't fully understand the mechanism by which Atropine works to slow progression. Atropine may also cause re-bound growth if the drop is ever stopped.[7] For this reason, parents who wish to start Atropine therapy on their child should commit to using the drop at least until their child is at least 17 years old.

Further reading:

- The Myopia Institute (myopiainstitute.org)
- My Kids Vision (mykidsvision.org/en-us)
- Bullimore, Mark & Brennan, Noel. (2019). *Myopia Control: Why Each Diopter Matters.* Optometry and Vision Science 96.1.10.1097

Meet the Doctor

Dr. Lea Hair attended University of Houston College of Optometry. While in Optometry school she opted to start a dual-degree program and earned a Masters in Optometric Research and Vision Science. Dr. Hair's master's thesis research centered on the soft contact lenses used in Myopia Control. Her research was presented at national Optometry meetings and published in a peer reviewed journal in 2021. Now she works at Achord Eye Clinic, where her primary passion involves fighting the Myopia Epidemic. This is personal for Dr. Hair, as she is a –7.50 diopter myope herself and her father is blind in one eye due to complications from his myopia.

Sources:

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2. Annechien E. G. Haarman, Clair A. Enthoven, J. Willem L. Tideman, Milly S. Tedja, Virginie J. M. Verhoeven, Caroline C. W. Klaver; The Complications of Myopia: A Review and Meta-Analysis. Invest. Ophthalmol. Vis. Sci. 2020;61(4):49. doi: https://doi.org/10.1167/iovs.61.4.49.
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7. Wu, PC., Chuang, MN., Choi, J. *et al.* Update in myopia and treatment strategy of atropine use in myopia control. *Eye* **33,** 3–13 (2019). https://doi.org/10.1038/s41433-018-0139-7