

Progressive myopia in children: What parents should know

What is Myopia?

Myopia, also known as near-sightedness, is a condition where a child can see nearby objects clearly, but distant objects look blurry. It happens usually when the eye grows too long from front to back, which is also called axial elongation. This causes incoming light rays to focus in front of the retina instead of directly on it. Myopia can also occur due to abnormalities in the lens and cornea. Myopia usually begins in childhood and tends to get worse, or progress, as a child grows. Many children can have a combination of myopia and astigmatism. Astigmatism is when the eye is more oval, like an American football instead of a basketball, and can cause light to focus unevenly on the retina, contributing to blurred or distorted vision.

Why Does Myopia Matter?

- Uncorrected myopia will cause blurry distance vision which can affect school performance, ability to participate in sports, confidence, and even long-term visual development.
- Myopia increases the risk of ocular complications. Even moderate myopia (-3 Diopters or higher) is associated with higher risks of retinal detachments, glaucoma, and cataracts. High myopia is when the glasses prescription increases above -6.0 Diopters or higher and has been found to be associated with even 20 times higher risk of retinal detachments along with glaucoma, early cataracts and myopic degeneration. These risks of other eye diseases do not go away if the child goes on to get LASIK or other refractive surgeries later in life because the heightened risks are due to the axial elongation, not due to the direct need for eyeglasses.

How Do We Treat Myopia?

Children with myopia need eyeglasses or contact lenses to help them see clearly in the distance. Refractive surgeries such as LASIK are not options for children because their eyes are still growing.

How Can We Slow Myopia Progression?

While myopia cannot usually be reversed, there are several strategies that have been shown to slow down its progression and slow axial elongation.

1. Environmental Changes

- **Increased Outdoor Time:** Many studies have shown that children who spend more time outdoors with exposure to natural light have less myopic progression. Children should aim to have at least 2 hours outside per day.
- **Limiting Digital Devices:** Children should avoid prolonged screen time for entertainment and should be encouraged to use larger devices held farther away from their eyes and faces (i.e. television on opposite wall would be preferable to a handheld tablet). Follow the **20-20-20 rule:** every 20 minutes of near work, look at something 20 feet away for 20 seconds.

2. Optical Strategies

- **Defocus Spectacles:** These spectacles are designed to have a central zone that helps children see better to correct their myopia, but they also have multiple small lens segments in the periphery (edge) of the lenses to create a controlled blur, or defocus, on the peripheral retina. This peripheral defocus has been found to slow progression of myopia and eye growth. The Essilor Stellest spectacles have been FDA approved for slowing myopic progression, and there are other brands available that offer similar designs as well. Children may not be candidates for these spectacle lenses if their eyeglasses prescription is too high or if they have certain other eye conditions such as strabismus (crossing or drifting of the eyes).
- **Dual Focus Soft Contact Lenses:** These are soft contact lenses worn during the day with different focus zones built into the lens designs. The central zone allows good vision and corrects the child's myopia while the outer zones create a peripheral defocus, like the defocus spectacles above, that slows eye growth and myopia progression. MiSight contact lenses by CooperVision are FDA approved daily wear contact lenses for slowing myopic progression and are available in a variety of powers. There are also other contact lens brands with similar designs, each with a different range of powers. This may be a good strategy for a child already interested in contact lenses wear.
- **Orthokeratology ("OrthoK"):** These are special rigid gas permeable contact lenses that are worn overnight to reshape the cornea (the front of the eye) while the child sleeps. This reshaping can provide clear vision during the day without glasses or contact lenses and also creates a focus pattern that helps slow myopia progression. This strategy does not "cure" myopia, works best for lower refractive errors and because children sleep in the rigid contact lens, there is an increased risk of corneal infections, scarring, and inflammation which can lead to loss of vision.

3. Medical Treatment

- **Low Dose Atropine Eyedrops:** Atropine is a long-acting dilation drop, like the eyedrops used to dilate children's eyes for their comprehensive eye exams. Mild doses (usually 0.01% to 0.05%) used on a nightly basis have been shown to slow eye growth and myopia progression in children. Low dose atropine eyedrops have been well studied and are typically well tolerated with no long-term side effects or complications. However, some children may experience mild light sensitivity or blurring of their near vision.

Which Strategy is Best for My Child?

If you are considering a treatment strategy to slow myopia progression in your child, it is important for your child to have complete and regular eye exams to look for ocular disease, track eye growth, adjust eyeglasses or contact lens prescriptions and discuss myopia control options. Each child is different, and it is best to discuss with your physician the best strategy for your child. Whichever treatment you and your physician choose is important because the most successful therapy will be the one that the child sticks to!