

MYOPIA AND TREATMENT OF MYOPIA IN CHILDREN

WHAT IS MYOPIA?

Myopia (“near-sightedness”) is a condition in which the front parts of the eye focus the incoming light rays that are coming from a distance to a point that is in front of the retina. The human eye works a lot like a traditional camera. The front part of the eye bends light so that a clear image is focused on the retina, a tissue in the back part of the eye which captures a picture like film does in a traditional camera. Myopia causes blurry vision because the light rays hitting the retina are out of focus. Different things can cause this problem with focusing of light rays, including problems in the lens (focusing part in the middle of the eye) or cornea (clear shield on the front of the eye), or by an eye that is abnormally long. Although persons with untreated myopia have blurred vision looking at a distance, they often have a spot at a close viewing distance where objects are clear. (See Figure 1.)

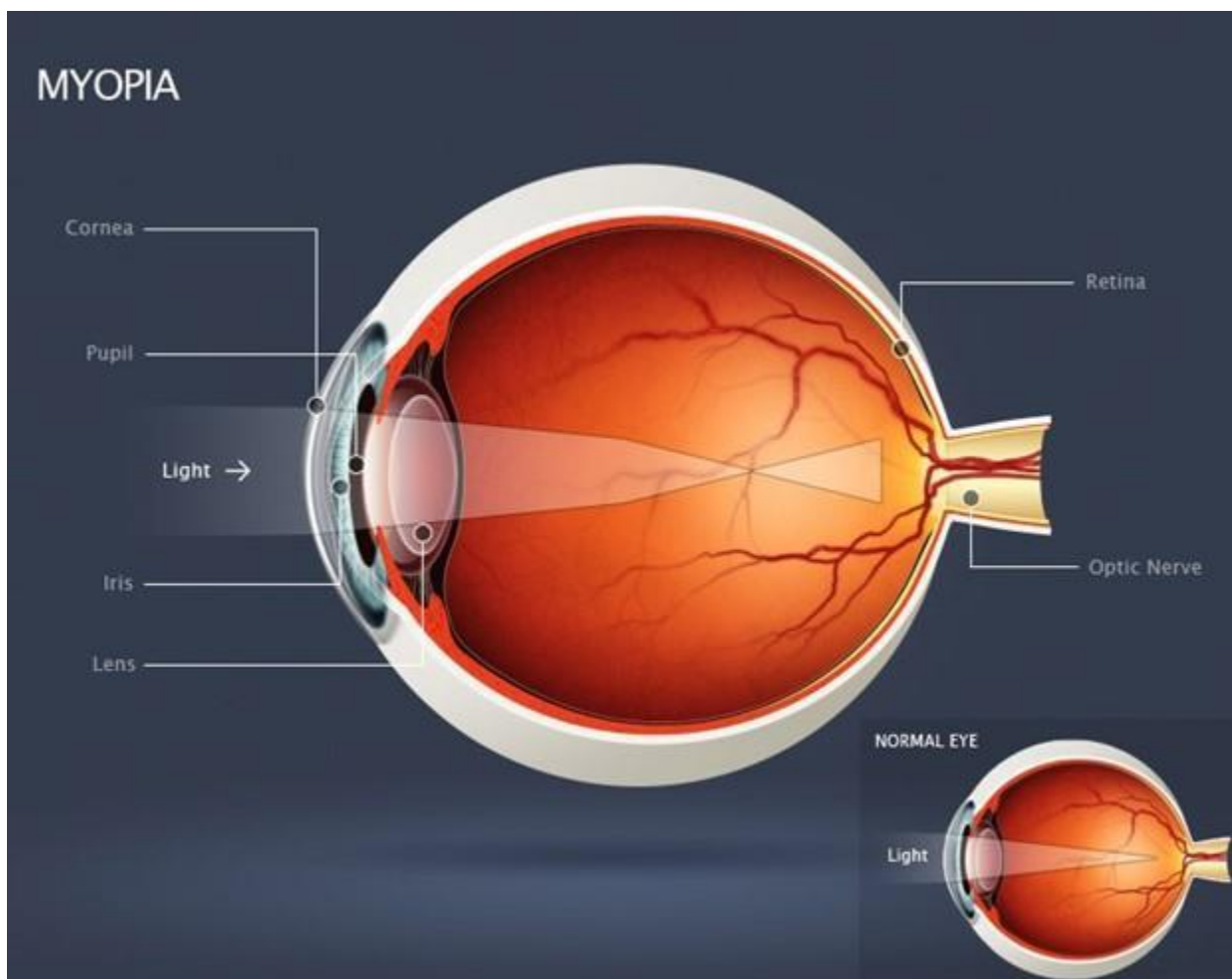


Figure 1. An eye with myopia is shown the light focusing in front of the retina. The is compared to a normal eye, in the bottom right, where light is focused on the retina.

WHY DOES MYOPIA GET WORSE WITH TIME?

Children with myopia (or nearsightedness) generally have a larger amount of nearsightedness as they grow through childhood and early adulthood. The time of greatest growth in nearsightedness is between ages 6 and 10 years in most children. As the eye grows it becomes longer and more nearsighted. There are many things that can cause a child's eye to become more or less nearsighted, including the amount of nearsightedness that each parent has, the time spent doing work close up and the amount of outdoor light exposure.



HOW DO GLASSES AND CONTACT LENSES WORK TO CORRECT MYOPIA?

During childhood, myopia (nearsightedness) is usually treated with glasses or contact lenses. Glasses and contact lens change how the light entering the eye is bent so that it is focused on the retina.

IS REFRACTIVE SURGERY A GOOD OPTION FOR CHILDREN?

Refractive surgery permanently changes how the front part of the eye bends light to make the light better focused on the retina. It is generally not a good treatment for children because during childhood the eye is still growing, so the effect of the surgery would not last.

WHAT IS HIGH MYOPIA?

High myopia, also called pathologic myopia, is when there is near-sightedness of -6.00 diopters or more OR the length of the eye measures greater than 26.5mm. Children who have parents with high myopia and/or those start to develop nearsightedness early in childhood are more likely to develop high myopia over time.

WHAT EYE PROBLEMS CAN OCCUR WITH HIGH MYOPIA?

Persons with high myopia have a higher chance of retinal holes, tears, and retinal detachment. Other possible eye problems include abnormal blood vessel growth beneath the retina, high eye pressure (glaucoma) and changes in the gel (vitreous) that fills the eye. These eye problems can cause permanent vision loss.

WHAT ARE THE CHANCES MY CHILD WILL DEVELOP MYOPIA?

There is a strong genetic link to myopia, so if either parent is nearsighted, the child is more likely to become nearsighted.

CAN MY CHILD DO ANYTHING TO SLOW DOWN MYOPIA?

There is currently a lot of research being done worldwide to try to understand myopia progression in children. Large amounts of time spent working at near focusing on things less than 1 foot has been shown to make myopia worse. An easy way to break up the focusing effort at near is to encourage kids to hold near work at least a foot from the face and to take breaks from near work every 20 minutes to look at a distance of 20 feet or more for a few seconds. Outdoor sunlight exposure has been shown to delay the start of nearsightedness in kids, so encouraging at least an hour of outdoor sunlight exposure per day (in a safe environment with sun protection) is a good practice.

WHAT TREATMENTS ARE THERE THAT SLOW MYOPIA?



Treatments that are shown to help keep nearsightedness from getting much worse in kids include eye drops and specially designed contact lenses and glasses.

Special contact lenses and glasses change how light is bent as it enters the eye. Animal studies show that the focus of light on different parts of the retina can control eye growth. The cells in the area of the retina that controls side vision makes signals that cause more eye growth and increased nearsightedness. The contacts and glasses that help slow myopia change how the light is bent so the growth controlling cells receive a more focused image and don't push the eye to grow longer or become more nearsighted. The contact lens types that are helpful to slow myopia include MiSight lenses, bifocal contact lenses and lenses that are worn nightly to change the shape of the cornea (orthokeratology). While these lenses are helpful in reducing nearsightedness, contact lens use in children should be carefully supervised. If contact lenses are not worn correctly and taken care of, it can cause infections and vision loss. The special glasses that similarly change how light enters the eye to slow nearsighted progression are not yet widely available in the United States.

Eye drops called low dose atropine have also been shown to help keep nearsightedness from getting much worse. Atropine is an eye drop that has been used for a long time in eye care to make the pupil (black spot in the center of the colored part of the eye) larger. The low small dose atropine for treatment of nearsightedness has very little effect on the size of the pupil and does not cause blurred vision when focusing at near. It is a treatment that has been well tolerated in children. Studies in many countries show that the drops help to slow nearsightedness. The studies in the United States are ongoing and the drop is not yet approved by the FDA. It is available for treatment of children with myopia or nearsightedness, but it must be made by a special compounding pharmacy. Atropine drops are generally used for the time that myopia typically increases in children and are stopped when myopia is likely to have stopped increasing or the eye has stopped growing. We are still learning what is the best way to treat with atropine, when to start it, when to stop it, and what strength to use.

HOW OFTEN SHOULD I HAVE MY CHILD'S MYOPIA CHECKED?

A yearly eye exam is recommended to check on myopia. If treatment to slow the rate of the nearsighted is started, the child may need to be seen multiple times a year and may need extra testing to help understand if the treatment is working.

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