

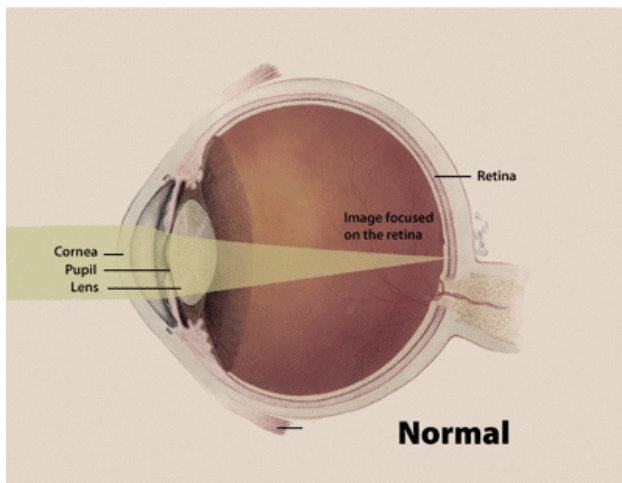
Refractive Errors

This material will give you an overview of what causes the different types of refractive errors and how each is treated.

What is a refractive error?

In a normal eye, the front part of the eye, which includes the cornea and the lens, acts like a camera lens. It focuses the light onto the retina in the back of the eye to transmit a clear image to the brain.

The cornea is the clear window on the front of the eye and the lens sits just behind the iris, or the colored part of the eye. The retina is the thin tissue at the back of the eye. (See picture below)

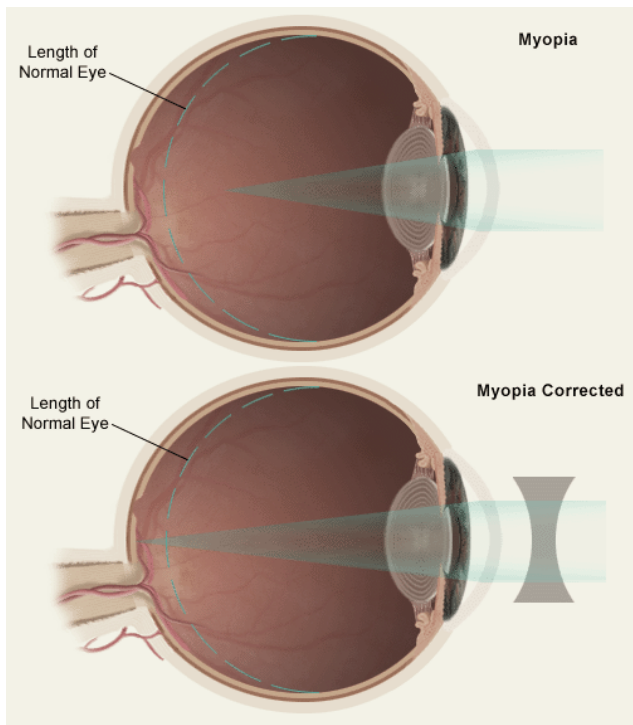


A refractive error occurs when the shape of your eye does not refract light properly. This leads to blurred vision.

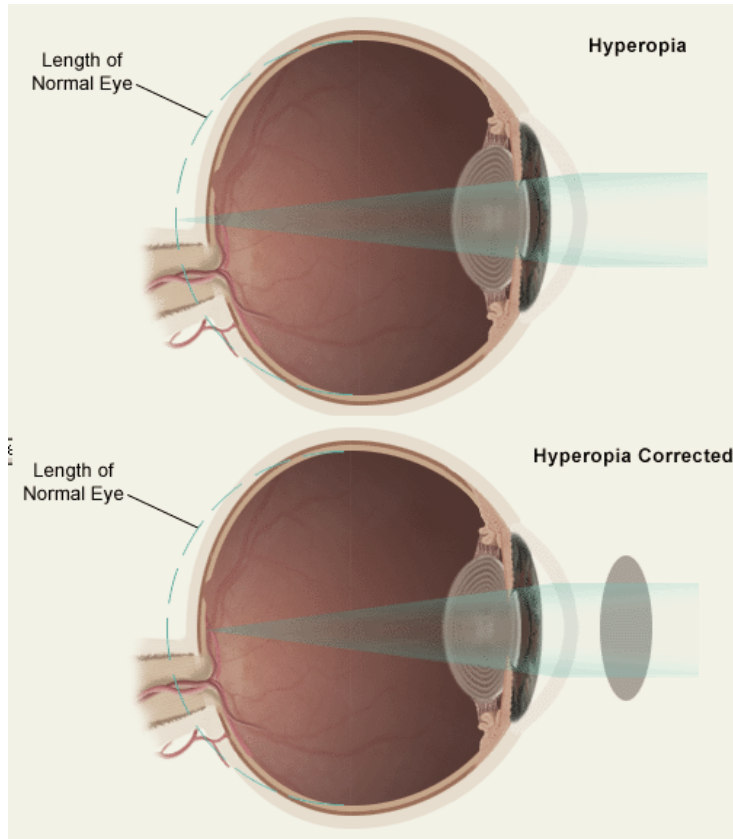
What causes refractive errors?

These are the four main causes of refractive errors: myopia, hyperopia, astigmatism, and presbyopia.

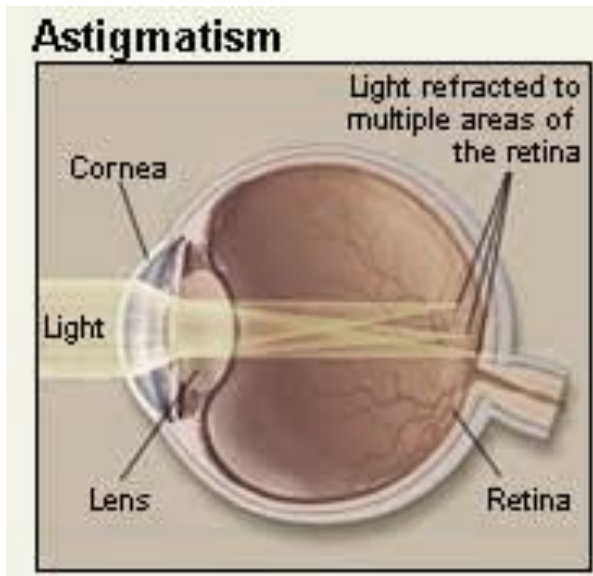
1. Myopia is also known as being “nearsighted.” It is caused when your eye is longer than normal or the cornea is too steep. This causes the light to be focused in front of the retina instead of on it when a person is looking far away. (See picture below) Nearsighted people all have a certain distance at which they can see really well up-close without glasses. This is why they are called “near” sighted.



2. Hyperopia is also known as being “farsighted.” This occurs when your eye is shorter than normal or has a cornea that is too flat. This causes the light to be focused behind the retina instead of on it (see picture below), especially when a person is looking at things close-up. Their near vision is worse than their distance vision, which is why they are called “far” sighted.



3. Astigmatism occurs when the cornea is shaped more like a football than like a basketball, making it unequally round in all directions. Because the cornea is not equally round in all directions, the light is not focused in a sharp point on the retina (see picture below), and your vision is blurry both for things that are close up and for things that are far away.



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4. Presbyopia is the name given for needing to use reading glasses when you are over the age of 40. When you are young, the lens of your eye is flexible and can focus at many different distances. As you age, your lens changes and becomes less flexible so that it becomes difficult to focus on near things. This makes it difficult to read without reading glasses.

How are most refractive errors treated?

Refractive errors are treated with eyeglasses or contact lenses. If you choose not to wear glasses all of the time, this will not damage your eyes as long as you are over the age of 9. (Children need to wear glasses in order for their eyes to develop good vision.) If your vision is poor enough and you choose not to wear glasses, you may not be legal to drive without your glasses even if it is fine not to wear glasses to do other activities. You should discuss this with your eye doctor.

Refractive surgery (such as LASIK) can also correct your refractive error. This is a good option for people who do not want to wear glasses or contact lenses.

During surgery, a doctor uses a laser to reshape the surface of the eye so that light will be better focused on the retina.

How is presbyopia treated?

If a person only has presbyopia, it can most often be treated with over-the-counter reading glasses. You can go to any drugstore, or sometimes even the dollar store, and try on different strengths of over-the-counter reading glasses. Bring your favorite reading material with you to the store and try on different pairs of glasses. If you are 40 years old, start by trying a +0.75. If you are 50, start by trying a +1.50. If you are 60, start by trying a +2.25. If you are 65 or older, start by trying a +2.50. Go up or down in strength by 0.25 each time to see what strength makes your reading material the clearest.

The strength of reading glasses you need depend on your age and on how far away you like to hold your reading material. You can use any strength of reading glasses that allows you to read comfortably. Wearing or not wearing glasses will not damage your eyes at all. It will just affect how clearly you can see.

For more information, scan these codes with your smartphone or visit these websites listed.



<http://www.kellogg.umich.edu/patientcare/conditions/refractive.errors.html>



<http://www.nlm.nih.gov/medlineplus/refractiveerrors.html>

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