

Refractive Errors in Children

How does the eye focus light?

The eye works a lot like a camera. Light enters through the pupil (the dark spot in the colored part of the eye). The cornea (the clear outer layer) and the lens (a round clear part inside the eye) help focus the light. The retina, at the back of the eye, receives the focused light and sends the image to the brain. To see clearly, the light must focus directly on the retina. If it doesn't, the person may have a refractive error.

There are three main types of refractive error: [myopia](#), hyperopia and [astigmatism](#) [See figures below].

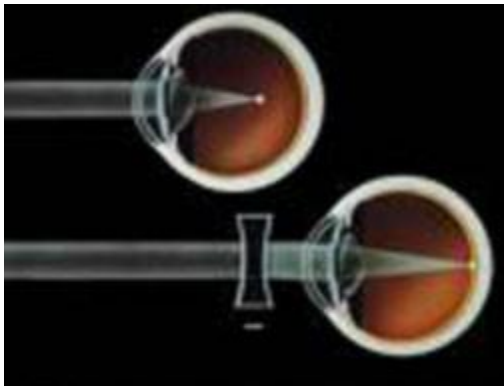


Figure. 1: Myopia

Light focuses **in front of** the retina because the eye is too long or the lens/cornea focuses too strongly. Far-away objects look blurry. Glasses or contact lenses with **minus (-) power** help by moving the focus back onto the retina.

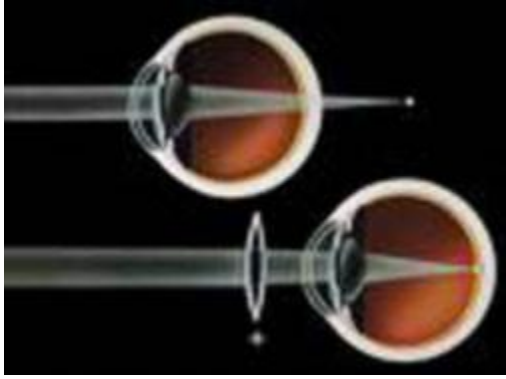


Figure. 2: Hyperopia

Light focuses **behind** the retina because the eye is too short or the lens/cornea doesn't focus enough. Near and far objects may both look blurry. **Plus (+) power** lenses help by moving the focus onto the retina.

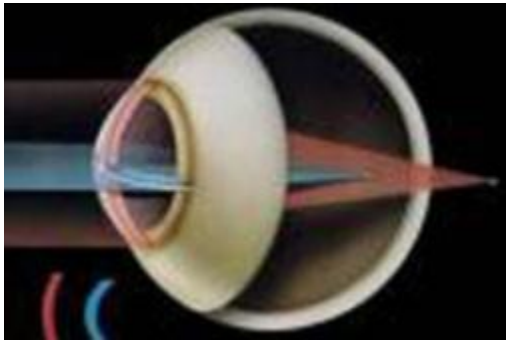


Figure. 3: Astigmatism

The front of the eye is shaped more like a football than a basketball. Light doesn't focus at one point, but at different spots, causing vision to look **blurry or stretched**. Special **cylinder-shaped lenses** help correct this.

WHAT IS MYOPIA (NEARSIGHTEDNESS)?

Myopia is when the eye is too long or has too much focusing power. This makes far-away things look blurry, but things up close are clear. It often starts in childhood and gets worse each year until the late teen or early adult years. **Glasses** with minus power are the most common treatment. **Contact lenses** may be used if the child is old enough to care for them. In older teens or adults, **laser surgery** might be an option once the eyes stop growing. There is no approved treatment to stop it from getting worse, but doctors are studying treatments like **eye drops (atropine)** and encouraging kids to spend more time **outdoors**.

WHAT IS HYPEROPIA (FARSIGHTEDNESS)?

Hyperopia means the eye is too short or does not focus light strongly enough. This makes near objects (and sometimes far ones too) look blurry. It is more common in children under 7 years old.

Small amounts of hyperopia are normal and often don't need treatment. Children can usually focus on their own using their eye muscles. If the hyperopia is high, the child's eyes are **crossed** or vision is blurry, they may need **plus (+) power glasses**.

Hyperopia often gets worse until around age 7–8 and then may improve as the child grows. **Contacts** or **laser surgery** may help later, but surgery usually isn't done until the eye stops growing.

WHAT IS ASTIGMATISM?

Astigmatism happens when the **cornea or lens is curved unevenly**, like a football instead of a round ball like a basketball. This causes blurry or distorted vision at all distances. It is common in babies and young children and may run in families.

Cylindrical lenses in glasses can correct astigmatism. Some people may also use **contact lenses** or **laser surgery** when they are older.

MANAGEMENT OF REFRACTIVE ERRORS

Kids often do not complain about blurry vision, especially if only one eye is affected. Parents may not notice any signs. However, if not treated, refractive errors can cause **permanent vision problems** in children. This is called **amblyopia** (lazy eye).

The best way to find a refractive error is with a **complete eye exam**. During the exam, the doctor will use **eye drops** to make the pupils bigger. This helps the doctor get an accurate reading of the child's refractive error. If needed, glasses or contacts will be prescribed.

If you have questions about your child's eyes or glasses, talk to your eye doctor.

Summary for Patients and Caregivers

The eye needs to focus light directly on the retina to see clearly. If it doesn't, your child may have a **refractive error** like **nearsightedness (myopia)**, **farsightedness (hyperopia)**, or **astigmatism**. These are common and can usually be treated with **glasses, contact lenses**, or later, **laser surgery**. Children often don't complain about blurry vision, so regular eye exams are important. If not treated early, vision problems can become

permanent. If you notice your child squinting, holding things too close, or struggling to see, talk to an eye doctor for help.