



## Refractive Errors

Refractive errors occur when light does not focus properly on the retina because of the shape of the eye. The resulting image is blurred. Common refractive errors are myopia (nearsightedness), hyperopia (farsightedness), astigmatism (distorted vision), and presbyopia (aging eyes).

### **Myopia**

A myopic eye is longer than a normal eye or has a cornea that is too steep, causing light rays to focus in front of the retina instead of on it. With myopia, close objects appear clear, but distant ones appear blurred.

### **Hyperopia**

A hyperopic eye is shorter than normal or has a cornea that is too flat. The light rays focus beyond the retina instead of on it. Distant objects appear clear, but close ones appear blurred.

### **Astigmatism**

The cornea of an astigmatic eye is curved unevenly. Images focus in front of and beyond the retina, causing both close and distant objects to appear blurry.

### **Presbyopia**

Presbyopia refers to the hardening of the lens that occurs with age. After the age of 40, the lens becomes more rigid and cannot change shape as easily to accommodate near objects. This makes reading and other tasks performed at close range difficult. Presbyopia can occur in combination with any of the other three refractive errors.

Refractive errors are usually corrected with eyeglasses or contact lenses. Sometimes surgery is needed or desirable. Some common surgical procedures include the following:

### **LASIK**

This popular procedure uses an instrument called a microkeratome to create a flap in the cornea so that the underlying corneal tissue can be reshaped with a laser.

### **Epi-LASIK**

This procedure is similar to LASIK in that it also uses a laser to reshape the cornea, but it uses a different device to create the corneal flap.

### **Photorefractive Keratectomy**

Photorefractive keratectomy (PRK) sculpts the surface of the cornea using a laser. A "bandage" contact lens is then applied for about three days to allow it to heal.

### **Intrastromal Corneal Rings**

Intrastromal corneal rings are crescent-shaped plastic segments implanted in the cornea to flatten the cornea and correct mild nearsightedness.

If you are considering any of these surgical procedures, it is important to discuss them with your ophthalmologist (Eye M.D.) so as to make an informed decision about whether refractive surgery is right for you. Sometimes the best option is to choose eyeglasses or contact lenses instead of surgery to correct a refractive error.

Side effects of any of these refractive surgery techniques include blurring, glare, poor night vision, corneal scarring, or permanent vision loss. No one method is known to be better than another. The most appropriate method depends on the specific condition and lifestyle of the patient.