

**EHIE-BISHOP GINA**

**NURSING SCIENCE**

**17/MHS02/037**

### **HYPEROPIA( FARSIGHTEDNESS)**

Hyperopia (Farsightedness). Hyperopia, which is also known as “farsightedness,” is usually due to either an eye ball that is too short or, occasionally, a lens system that is too weak. In this condition, as seen in the middle panel of parallel light rays are not bent sufficiently by the relaxed lens system to come to focus by the time they reach the retina.

- To overcome this abnormality, the ciliary muscle must contract to increase the strength of the lens. By using the mechanism of accommodation, a farsighted person is capable of focusing distant objects on the retina.
- If the person has used only a small amount of strength in the ciliary muscle to accommodate for the distant objects, he or she still has much accommodative power left, and objects closer and closer to the eye can also be focused sharply until the ciliary muscle has contracted to its limit. In old age, when the lens becomes “presbyopic,” a farsighted person is often unable to accommodate the lens sufficiently to focus even distant objects, much less near objects.

### **MYOPIA( NEARSIGHTEDNESS)**

Myopia (Nearsightedness). In myopia, or “nearsightedness,” when

the ciliary muscle is completely relaxed, the light rays coming from distant objects are focused in front of the retina.

- This is a defect of vision in which far objects appear blurred but near objects are seen clearly. The image is focused in front of the retina rather than on it usually because the eyeball is too long or the refractive power of the eye's lens too strong.
- This is usually due to too long an eyeball, but it can result from too much refractive power in the lens system of the eye.
- No mechanism exists by which the eye can decrease the strength of its lens to less than that which exists when the ciliary muscle is completely relaxed.
- A myopic person has no mechanism by which to focus distant objects sharply on the retina. However, as an object moves nearer to the person's eye, it finally gets close enough that its image can be focused. Then, when the object comes still closer to the eye, the person can use the mechanism of accommodation to keep the image focused clearly.
- A myopic person has a definite limiting "far point" for clear vision.

### **CORRECTION OF MYOPIA AND HYPEROPIA**

- Correction of Myopia and Hyperopia by Use of Lenses. It will be recalled that light rays passing through a concave lens diverge. If the refractive surfaces of the eye have too much refractive power, as in myopia, this excessive refractive power

can be neutralized by placing in front of the eye a concave spherical lens, which will diverge rays.

- Conversely, in a person who has hyperopia—that is, someone who has too weak a lens system—the abnormal vision can be corrected by adding refractive power using a convex lens in front of the eye. One usually determines the strength of the concave or convex lens needed for clear vision by “trial and error”—that is, by trying first a strong lens and then a stronger or weaker lens until the one that gives the best visual acuity is found.

### **Formation of an Image by a Convex Lens**

A convex lens with two point sources of light to the left. Because light rays pass through the center of a convex lens without being refracted in either direction, the light rays from each point source of light are shown to come to a point focus on the opposite side of the lens directly in line with the point source and the center of the lens

Any object in front of the lens is, in reality, a mosaic of point sources of light. Some of these points are very bright some are very weak, and they vary in color.

