



كلية المستقبل الجامعة

قسم تقنيات البصريات

الفيزياء الطبية والبصرية

المرحلة الاولى

المحاضرة التاسعة

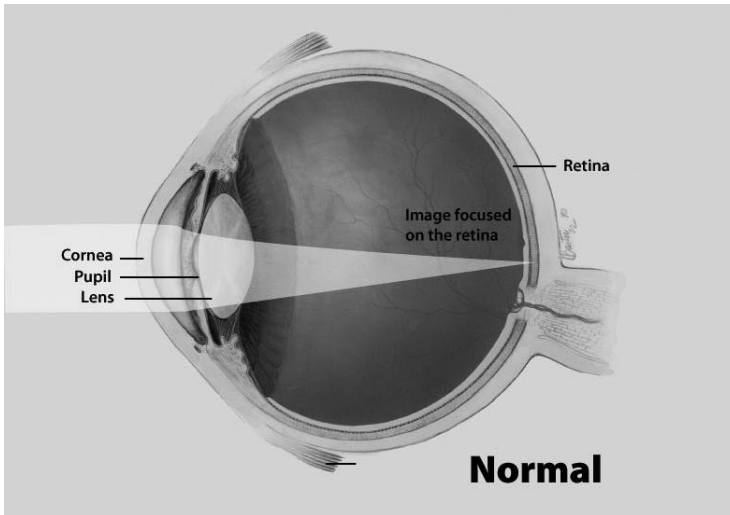
Department of Optics Techniques

Lecture 9

Refractive Errors

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Facts About Refractive Errors



Refractive errors occur when the shape of the eye prevents light from focusing directly on the retina. The length of the eyeball (longer or shorter), changes in the shape of the cornea, or aging of the lens can cause refractive errors.

● What are refractive errors?

Refractive errors occur when the shape of the eye prevents light from focusing directly on the retina. The length of the eyeball (longer or shorter), changes in the shape of the cornea, or aging of the lens can cause refractive errors.

● What is refraction?

Refraction is the bending of light as it passes through one object to another. Vision occurs when light rays are bent (refracted) as they pass through the cornea and the lens. The light is then focused on the retina. The retina converts the light-rays into messages that are sent through the optic nerve to the brain. The brain interprets these messages into the images we see.

● What are the different types of refractive errors?

The most common types of refractive errors are myopia, hyperopia, presbyopia, and astigmatism.

Myopia (nearsightedness) is a condition where objects up close appear clearly, while objects far away appear blurry. With myopia, light comes to focus in front of the retina instead of on the retina.

Hyperopia (farsightedness) is a common type of refractive error where distant objects may be seen more clearly than objects that are near. However, people experience hyperopia differently. Some people may not notice any problems with their vision, especially when they are young. For people with significant hyperopia, vision can be blurry for objects at any distance, near or far.

Astigmatism is a condition in which the eye does not focus light evenly onto the retina, the light-sensitive tissue at the back of the eye. This can cause images to appear blurry and stretched out.

Presbyopia is an age-related condition in which the ability to focus up close becomes more difficult. As the eye ages, the lens can no longer change shape enough to allow the eye to focus close objects clearly.

● Who is at risk for refractive errors?

Presbyopia affects most adults over age 35. Other refractive errors can affect both children and adults. Individuals that have parents with certain refractive errors may be more likely to get one or more refractive errors.

● What are the signs and symptoms of refractive errors?

Blurred vision is the most common symptom of refractive errors. Other symptoms may include:

- Double vision
- Haziness
- Glare or halos around bright lights
- Squinting
- Headaches
- Eye strain

● How are refractive errors diagnosed?

An eye care professional can diagnose refractive errors during a comprehensive dilated eye examination. People with a refractive error often visit their eye care professional with complaints of visual discomfort or blurred vision. However, some people don't know they aren't seeing as clearly as they could.

● How are refractive errors treated?

Refractive errors can be corrected with eyeglasses, contact lenses, or surgery.

Eyeglasses are the simplest and safest way to correct refractive errors. Your eye care professional can prescribe appropriate lenses to correct your refractive error and give you optimal vision.

Contact Lenses work by becoming the first refractive surface for light rays entering the eye, causing a more precise refraction or focus. In many cases, contact lenses provide clearer vision, a wider field of vision, and greater comfort. They are a safe and effective option if fitted and used properly. It is very important to wash your hands and clean your lenses as instructed in order to reduce the risk of infection.

If you have certain eye conditions you may not be able to wear contact lenses. Discuss this with your eye care professional.

Refractive Surgery aims to change the shape of the cornea permanently. This change in eye shape restores the focusing power of the eye by allowing the light rays to focus precisely on the retina for improved vision. There are many types of refractive surgeries. Your eye care professional can help you decide if surgery is an option for you.