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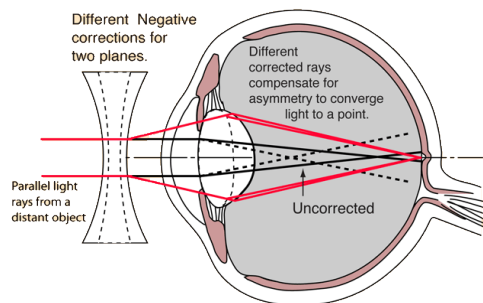
❖ **Write short notes on eye defects**

➤ **Astigmatism**

This is a type of refractive error in which the eye does not focus light evenly on the retina. This results in distorted or blurred vision at any distance

This defect is when the light rays do not all come to a single focal point on the retina, instead some focus on the retina and some focus in front of or behind it.

This is usually caused by a non-uniform curvature of the cornea. A typical symptom of astigmatism is if you are looking at a pattern of lines placed at various angles and the lines running in one direction appear sharp whilst those in other directions appear blurred. Astigmatism can usually be corrected by using a special spherical cylindrical lens; this is placed in the out-of-focus axis.



❖ **Symptoms of astigmatism**

- eyestrain
- headaches,
- Trouble driving at night.
- blurred vision
- double vision
- Squinting

❖ **Causes of astigmatism**

- Partially genetic factors

❖ **Classification**

- There are three primary types of astigmatism:

- myopic astigmatism,
 - hyperopic astigmatism
 - Mixed astigmatism.
- ✓ Cases can be classified further, such as regular or irregular and lenticular or corneal.

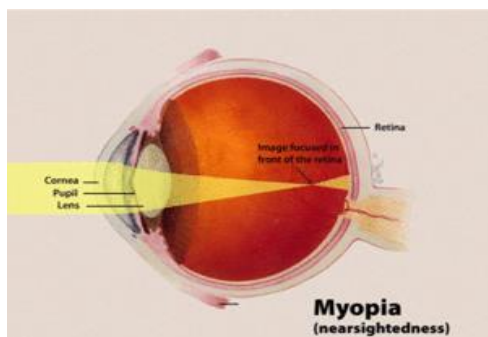
❖ Treatment

- ✓ Astigmatism may be corrected with
- eyeglasses,
 - contact lenses,
 - Refractive surgery.
- ✓ Glasses are the simplest and safest, although contact lenses can provide a wider field of vision.
- ✓ Refractive surgery can eliminate the need to wear corrective lenses altogether by permanently changing the shape of the eye but, like all elective surgery, comes with both greater risk and expense than the non-invasive options. Various considerations involving eye health, refractive status, and lifestyle determine whether one option may be better than another. In those with keratoconus, certain contact lenses often enable patients to achieve better visual acuity than eyeglasses. Once only available in a rigid, gas-permeable form, toric lenses are now also available as soft lenses.
- ✓ In older people, astigmatism can also be corrected during cataract surgery. This can either be done by inserting a toric intraocular lens or by performing special incisions (limbal relaxing incisions). Toric intraocular lenses probably provide a better outcome with respect to astigmatism in these cases than limbal relaxing incisions.

➤ Myopia (nearsightedness or short sightedness)

❖ Definition of myopia

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.



❖ Symptoms of myopia

- Difficulty reading road signs and seeing distant objects clearly, but will be able to see well for close-up tasks such as reading and computer use.
- Squinting, eye strain and headaches.
- Feeling fatigued when driving or playing sports also can be a symptom of uncorrected nearsightedness.

❖ Causes of myopia

- Nearsightedness can also be caused by the cornea and/or lens being too curved for the length of the eyeball. In some cases, myopia occurs due to a combination of these factors. Myopia typically begins in childhood, and you may have a higher risk if your parents are nearsighted. In most cases, nearsightedness stabilizes in early adulthood but sometimes it continues to progress with age.

❖ Treatment of myopia

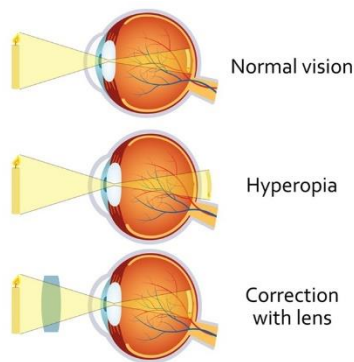
- Nearsightedness can be corrected with eyeglasses, contact lenses or refractive surgery. Depending on the degree of your myopia, you may need to wear your glasses or contact lenses all the time or only when you need very clear distance vision, like when driving, seeing a chalkboard or watching a movie.
- Good choices for eyeglass lenses for nearsightedness include high-index lenses (for thinner, lighter glasses) and lenses with anti-reflective coating. Also, consider photochromic lenses to protect your eyes from UV rays and high-energy blue light and to reduce the need for a separate pair of prescription sunglasses outdoors.
- If you're nearsighted, the first number ("sphere") on your eyeglasses prescription or contact lens prescription will be preceded by a minus sign (–). The higher the number, the more nearsighted you are.
- Refractive surgery can reduce or even eliminate your need for glasses or contacts. The most common procedures are performed with an excimer laser.

In PRK the laser removes a layer of corneal tissue, which flattens the cornea and allows light rays to focus more accurately on the retina.

In LASIK — the most common refractive procedure — a thin flap is created on the surface of the cornea, a laser removes some corneal tissue, and then the flap is returned to its original position.

➤ **Hyperopia (farsightedness or long sightedness)**

This is a defect of vision in which there is difficulty with near vision but far objects can be seen easily. The image is focused behind the retina rather than upon it. This occurs when the eyeball is too short or the refractive power of the lens is too weak.



❖ Causes of hyperopia

- Low converging power of eye lens because of weak action of ciliary muscles
- Abnormal shape of the cornea
- In rare instances hyperopia can be due to diabetes, and problems with the blood vessels in the retina.

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- ✓ Far-sightedness is often present from birth, but children have a very flexible eye lens, which helps to compensate.

❖ Signs and symptoms of hyperopia

- blurry vision
- headaches
- Eye strain
- Difficulty seeing with both eyes (binocular vision) may occur, as well as difficulty with depth perception.

❖ Complications

- Far-sightedness can have rare complications such as strabismus and amblyopia. At a young age, severe far-sightedness can cause the child to have double vision as a result of over-focusing.

❖ Diagnosis of hyperopia

- There are three clinical categories of hyperopia:
 - Simple hyperopia: Occurs naturally due to biological diversity.
 - Pathological hyperopia: Caused by disease, trauma, or abnormal development.
 - Functional hyperopia: Caused by paralysis that interferes eye's ability to accommodate.
- There are also three categories severity:
 - Low: Refractive error less than or equal to +2.00 diopters (D).
 - Moderate: Refractive error greater than +2.00 D up to +5.00 D.
 - High: Refractive error greater than +5.00 D.

❖ Treatment of hyperopia

- Corrective lenses

The simplest form of treatment for far-sightedness is the use of corrective lenses, eyeglasses or contact lenses. Eyeglasses used to correct far-sightedness have convex lenses.

- Surgery

There are also surgical treatments for far-sightedness:

- Photorefractive keratectomy (PRK)
- Removal of a minimal amount of the corneal surface[13][14]
- Laser assisted in situ keratomileusis (LASIK)
- Laser eye surgery to reshape the cornea, so that glasses or contact lenses are no longer needed.
- Refractive lens exchange (RLE)
- A variation of cataract surgery where the natural crystalline lens is replaced with an artificial intraocular lens; the difference is the existence of abnormal ocular anatomy which causes a high refractive error.
- Laser epithelial keratomileusis (LASEK)
- Resembles PRK, but uses alcohol to loosen the corneal surface.