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Short notes on two eye defects

Myopia: (nearsightedness) 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. Myopia can be corrected by wearing glasses/contacts with concave lenses these help to focus the image on the retina. Nearsightedness (myopia) is a common vision condition in which you can see objects near to you clearly, but objects farther away are blurry. It occurs when the shape of your eye causes light rays to bend (refract) incorrectly, focusing images in front of your retina instead of

on your retina. Nearsightedness may develop gradually or rapidly, often worsening during childhood and adolescence. Nearsightedness tends to run in families, a basic eye exam can confirm nearsightedness. You can compensate for the blur with eyeglasses, contact lenses or refractive surgery.

SYMPTOMS

Nearsightedness symptoms may include:

- Blurry vision when looking at distant objects
- The need to squint or partially close the eyelids to see clearly
- Headaches caused by eyestrain
- Difficulty seeing while driving a vehicle, especially at night (night myopia)

Nearsightedness is often first detected during childhood and is commonly diagnosed between the early school years through the teens. A child with nearsightedness may:

- Persistently squint
- Need to sit closer to the television, movie screen or the front of the classroom
- Seem to be unaware of distant objects
- Blink excessively
- Rub his or her eyes frequently

What causes myopia?

Myopia treatment

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.

Astigmatism: 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.

Astigmatism is a common vision condition that causes blurred vision. It occurs when the cornea (the clear front cover of the eye) is irregularly shaped or sometimes because of the curvature of the lens inside the eye.

An irregularly shaped cornea or lens prevents light from focusing properly on the retina, the light-sensitive surface at the back of the eye. As a result, vision becomes blurred at any distance. This can lead to eye discomfort and headaches.

Astigmatism frequently occurs with other vision conditions like myopia (nearsightedness) and hyperopia (farsightedness). Together these vision conditions are referred to as refractive errors because they affect how the eyes bend or "refract" light.

There are many causes to astigmatism. It can be hereditary and is usually present from birth. It can decrease or increase over time.

The curvature of the cornea and lens bends the light entering the eye in order to focus it precisely on the retina at the back of the eye. In astigmatism, the surface of the cornea or lens has a somewhat different curvature, the surface of the cornea is shaped more like a football instead of round like a basketball, the eye is unable to focus light rays to a single point. Vision becomes out of focus at any distance.

In addition, the curvature of the lens inside the eye can change, resulting in an increase or decrease in astigmatism. This change frequently occurs in adulthood and can precede the development of naturally occurring cataracts.

Sometimes astigmatism may develop following an eye injury or eye surgery.

Astigmatism also occurs due to a relatively rare condition called keratoconus in which the cornea becomes progressively thinner and cone-shaped. This results in a large amount of astigmatism, which causes poor vision that cannot be clearly corrected with eyeglasses. People with keratoconus usually need contact lenses for clear vision and eventually may need a corneal transplant.

ASTIGMATISM TREATMENT

- **Eyeglasses.** People with astigmatism primarily choose eyeglasses to improve their vision. The eyeglasses contain a special cylindrical lens prescription that compensates for the astigmatism. This provides additional power in specific parts of the lens.

  Generally, a single-vision lens is prescribed to provide clear vision at all distances. However, patients over age 40 who have presbyopia may need a bifocal or progressive addition lens.

- **Contact lenses.** Some people will have better vision with contact lenses rather than eyeglasses. Contact lenses may provide clearer vision and a wider field of view. However, since contact lenses are worn directly on the eyes, they require regular cleaning and care to safeguard eye health.

Standard soft lenses may not be effective in correcting astigmatism. However, special toric soft contact lenses can correct for many types of astigmatism. Because rigid gas-permeable contact lenses maintain their regular shape while on the cornea, they can compensate for the cornea's irregular shape and improve vision for people with astigmatism.

- **Orthokeratology:** Orthokeratology (ortho-k) involves the fitting of a series of rigid contact lenses to reshape the cornea. The patient wears contact lenses for limited periods, such as overnight, and then removes them. People with moderate astigmatism may be able to temporarily obtain clear vision without lenses for most of their daily activities. Orthokeratology does not permanently improve vision. If patients stop wearing the retainer lenses, their vision may return to its original condition.

- **Laser and other refractive surgery procedures.** Astigmatism can also be corrected by reshaping the cornea through LASIK (laser in situ keratomileusis) or PRK (photorefractive keratectomy). PRK removes tissue from the superficial and inner layers of the cornea. LASIK removes tissue only from the inner layer of the cornea.