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DEPARTMENT: NURSING

QUESTION: WRITE SHORT NOTES ON ANY TWO EYE DEFECTS

1. **ASTIGMATISM**

**What is astigmatism?**

Astigmatism is a common vision problem caused by an error in the shape of the [cornea](https://www.healthline.com/human-body-maps/cornea). With astigmatism, the lens of the eye or the cornea, which is the front surface of the eye, has an irregular curve. This can change the way light passes, or refracts, to your [retina](https://www.healthline.com/human-body-maps/retina). This causes blurry, fuzzy, or distorted vision. [Farsightedness](https://www.healthline.com/health/farsightedness) and [nearsightedness](https://www.healthline.com/health/nearsightedness) are two other types of problems with the way light passes to your retina. Farsightedness is called hyperopia. Nearsightedness is called myopia.

T**ypes of astigmatism**

The two main types of astigmatism are corneal and lenticular. A corneal astigmatism happens when your cornea is misshapen. A lenticular astigmatism happens when your lens is misshapen.

**Causes of astigmatism**

It’s not known what causes astigmatism, but genetics is a big factor. It’s often present at birth, but it may develop later in life. It may also occur as a result of an injury to the eye or after eye surgery. Astigmatism often occurs with nearsightedness or farsightedness.

**Who is at risk for astigmatism?**

Astigmatism can occur in children and adults. Your risk of developing astigmatism may be higher if you have any of the following:

* A family history of astigmatism or other eye disorders, such as keratoconus (degeneration of the cornea)
* Scarring or thinning of your cornea
* Excessive nearsightedness, which creates blurry vision at a distance
* Excessive farsightedness, which creates blurry close-up vision
* A history of certain types of eye surgery, such as [cataract](https://www.healthline.com/health/cataract) surgery (surgical removal of a clouded lens)

**Symptoms of astigmatism**

The symptoms of astigmatism may differ in each person. Some people don’t have any symptoms at all. The symptoms of astigmatism include:

* Blurry, distorted, or fuzzy vision at all distances (up close and far away)
* Difficulty seeing at night
* Eye strain
* Squinting
* Eye irritation
* Headaches

See a doctor if you have symptoms of astigmatism. Some symptoms may also be due to other health or vision problems.

**How is astigmatism diagnosed?**

An optometrist or ophthalmologist diagnoses astigmatism through a comprehensive eye examination. An optometrist is a doctor who diagnoses vision problems and eye diseases. An ophthalmologist is a doctor who provides medical and surgical treatment of vision problems and eye diseases. There are several tests optometrists and ophthalmologists may use during your eye examination to diagnose astigmatism.

**Visual acuity assessment test**

During a [visual acuity assessment test](https://www.healthline.com/health/visual-acuity-test), your doctor will ask you to read letters from a chart at a specific distance to determine how well you can see the letters.

**Refraction test**

A [refraction test](https://www.healthline.com/health/refraction-test) uses a machine called an optical refractor. The machine has multiple corrective glass lenses of different strengths. Your doctor will ask you to read a chart while looking through lenses that are different strengths on the optical refractor. They’ll eventually find a lens that appropriately corrects your vision.

**Keratometry**

Keratometry is a way for your doctor to measure the curvature of your cornea. They will do this by looking at your eye through a keratometer.

**Treatments for astigmatism**

Mild cases of astigmatism may not require treatment. Your doctor may treat astigmatism that causes vision problems by using one of the following methods.

**Corrective lenses**

Corrective eyeglasses and contact lenses prescribed by a doctor are the most common and least invasive treatments for astigmatism.

**Orthokeratology (Ortho-K)**

Orthokeratology (Ortho-K) is a treatment that uses rigid contact lenses to temporarily correct the irregular curvature of your cornea. You’ll wear rigid contact lenses for limited periods of time. You may wear them during sleep and then remove them during the day. Some people have clear vision during the day without corrective lenses when undergoing Ortho-K. The benefits of Ortho-K are only present when using it. Your vision will return to its previous state after stopping Ortho-K.

**Surgery**

Your doctor may recommend refractive surgery if you have a severe case. This type of surgery involves using lasers or small knives to reshape your cornea. This will permanently correct your astigmatism. The three common surgeries for astigmatism are laser in situ keratomileusis (LASIK), photorefractive keratectomy (PRK), and radial keratotomy (RK). All surgeries carry some risks. Talk to your doctor about the risks and benefits before getting surgery for astigmatism.

**What are the complications associated with astigmatism?**

A [lazy eye](https://www.healthline.com/symptom/lazy-eye) can occur if astigmatism in one eye isn’t corrected. Lazy eye is also called amblyopia.

**The lazy eye**

The medical term for lazy eye is “amblyopia.” Amblyopia occurs when your brain favors one eye, often due to poor vision in your other eye. Eventually, your brain might ignore signals from your weak, or “lazy,” eye. The condition can result in vision impairment and loss of depth perception.

Your affected eye doesn’t necessarily look different, although it may “wander” in different directions. That’s where the term “lazy” comes from. The condition will usually only affect one of your eyes, but in certain circumstances, the vision in both of your eyes can be affected.

The condition usually occurs in children. According to the [Mayo Clinic](http://www.mayoclinic.org/diseases-conditions/lazy-eye/basics/definition/con-20029771), it’s the leading cause of decreased vision among children.

It’s important to note that a lazy eye isn’t the same as a crossed or turned eye. That condition is called strabismus. However, strabismus can lead to amblyopia if your crossed eye gets much less use than your uncrossed one.

If amblyopia goes untreated, temporary or permanent loss of vision can occur. This can include loss of both depth perception and 3-D vision.

**Signs of lazy eye**

Amblyopia may be hard to detect until it becomes severe. Early warning signs include:

* A tendency to bump into objects on one side
* An eye that wanders inward or outward
* Eyes that appear not to work together
* Poor depth perception
* Double vision
* Squinting

**What is the long-term outlook?**

Corrective lenses or surgery can usually restore your vision to normal. There’s no known way to prevent astigmatism from developing.

1. **MYOPIA**

Myopia occurs when the eyeball is too long, relative to the focusing power of the cornea and lens of the eye. This causes light rays to focus at a point in front of the [retina](https://www.allaboutvision.com/resources/retina.htm), rather than directly on its surface.

Nearsightedness can also be caused by the [cornea](https://www.allaboutvision.com/resources/cornea.htm) 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.

**Myopia treatment**

Nearsightedness can be corrected with [eyeglasses](https://www.allaboutvision.com/eyeglasses/), [contact lenses](https://www.allaboutvision.com/contacts/) or [refractive surgery](https://www.allaboutvision.com/visionsurgery/).

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](https://www.allaboutvision.com/lenses/highindx.htm) (for thinner, lighter glasses) and lenses with [anti-reflective coating](https://www.allaboutvision.com/lenses/anti-reflective.htm). Also, consider [photochromic lenses](https://www.allaboutvision.com/lenses/photochromic.htm) 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](https://www.allaboutvision.com/eyeglasses/eyeglass-prescription.htm) or [contact lens prescription](https://www.allaboutvision.com/contacts/contact-lens-rx.htm) 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](https://www.allaboutvision.com/visionsurgery/prk.htm) 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.

Then there’s [orthokeratology](https://www.allaboutvision.com/contacts/orthok.htm)a non-surgical procedure where you wear special rigid gas permeable ([RGP or GP](https://www.allaboutvision.com/contacts/rgps.htm)) contact lenses at night that reshape your cornea while you sleep. When you remove the lenses in the morning, your cornea temporarily retains the new shape, so you can see clearly during the day without glasses or contact lenses.

Orthokeratology and a related GP contact lens procedure called corneal refractive therapy (CRT) have been proven effective at temporarily correcting mild to moderate amounts of myopia. Both procedures are good alternatives to surgery for individuals who are too young for LASIK or are not good candidates for refractive surgery for other reasons.

Implantable lenses known as [phakic IOLs](https://www.allaboutvision.com/visionsurgery/implantable-lenses.htm%22%20%5Co%20%22) another surgical option for correcting nearsightedness, particularly for individuals with high amounts of myopia or thinner-than-normal corneas that could increase their risk of [complications from LASIK](https://www.allaboutvision.com/visionsurgery/lasik_complication_1.htm) or other laser vision correction procedures.

Phakic IOLs work like contact lenses, except they are surgically placed within the eye and typically are permanent, which means no maintenance is needed. Unlike IOLs used in [cataract surgery](https://www.allaboutvision.com/conditions/cataract-surgery.htm), phakic IOLs do not replace the eye’s natural lens, which is left intact.

**Controlling myopia**

With more people becoming nearsighted, there is a lot of interest in finding ways to control the progression of myopia in childhood.

A number of different techniques have been tried, including fitting children with [bifocals](https://www.allaboutvision.com/lenses/multifocal.htm), [progressive lenses](https://www.allaboutvision.com/lenses/progressives.htm) and gas permeable contact lenses. All of these have delivered mixed results.

Recent clinical trials showed that low-dose atropine eye drops could slow myopia progression in school-age children, with significantly fewer side effects compared with higher concentrations.

Some kids, though, don't respond well to atropine drops.

A dual-focus daily disposable contact lens decreased the progression rate of myopia in children between 8 and 12 years old when compared to a single vision lens.

The specially designed multifocal lenses reduced [myopia progression](https://www.allaboutvision.com/parents/myopia-progression.htm) by 59 percent at one year, 54 percent at two years and 52 at three years, compared with the myopia progression experienced by children who wore conventional contact lenses.

**Degenerative myopia**

In most cases, nearsightedness is simply a minor inconvenience and poses little or no risk to the health of the eye. But sometimes myopia can be so progressive and severe it is considered a degenerative condition.

Degenerative myopia (also called malignant or pathological myopia) is a relatively rare condition that is believed to be hereditary and usually begins in early childhood. About 2 percent of Americans are afflicted, and degenerative myopia is a leading cause of [legal blindness](https://www.allaboutvision.com/lowvision/legally-blind.htm).

In malignant myopia, the elongation of the eyeball can occur rapidly, leading to a quick and severe progression of myopia and loss of vision. People with this condition have a significantly increased risk of retinal detachment and other degenerative changes in the back of the eye (such as bleeding in the eye from abnormal blood vessel growth).

Degenerative myopia also may increase the risk of [cataracts](https://www.allaboutvision.com/conditions/cataracts.htm).