



Glaucoma

GIAUCOMA



Glaucoma is an eye disease that can damage your optic nerve . optic nerve supplies visual information to brain from eyes

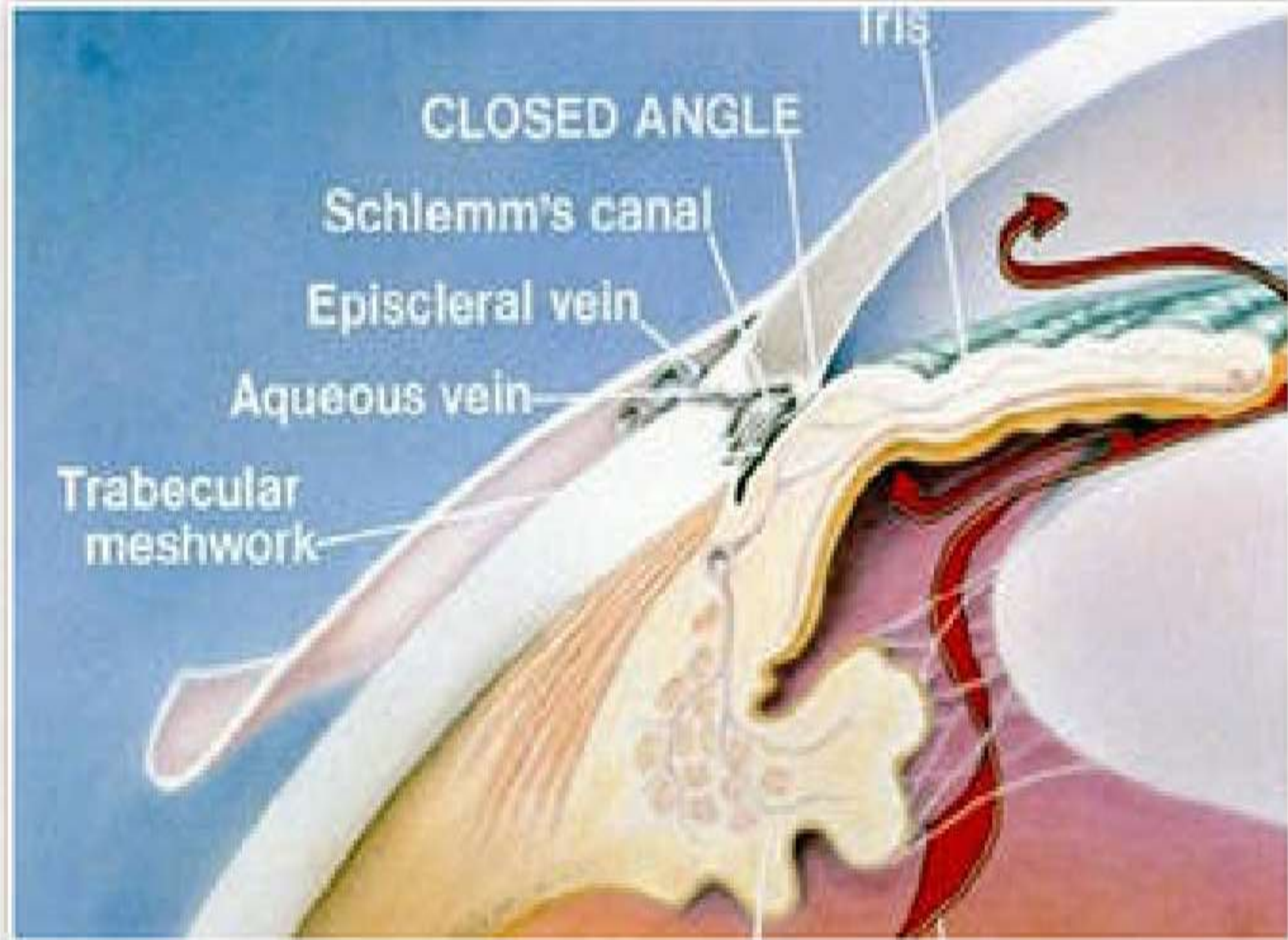
Glaucoma



Glaucoma is usually, but not always , the result of abnormally high pressure inside eye . Over time, the increased pressure > 20 can erode optic nerve tissue, which may lead to vision loss or even blindness. If it's caught early, you may be able to prevent additional vision loss

Causes OF Glaucoma

The back of eye continuously makes a clear fluid called aqueous humor. As this fluid is made, it fills the front part of eye. Then, it leaves eye through channels in your cornea and iris. If these channels are blocked or partially obstructed, the natural pressure in eye, which is called the intraocular pressure (IOP), may increase. As IOP increases, optic nerve may become damaged. As damage to nerve progresses, may begin losing sight in eye



causes the pressure in eye

dilating eye drops •

blocked or restricted drainage in your eye •

poor or reduced blood flow to your optic nerve •

high or elevated blood pressure •

▪

Types of Glaucoma

Open-Angle (Chronic) Glaucoma

Angle-Closure (Acute) Glaucoma

Congenital Glaucoma

Secondary Glaucoma

Normal Tension Glaucoma



Glaucoma

Risk factor of Glaucoma



Age

Family History

Medical History

Eye Problems

Diagnose



Detailed Medical History

Pachymetry Test

Perimetry Test

Tonometry Test

Treatment of Glaucoma




The goal of glaucoma treatment is to reduce IOP to stop any additional eyesight loss. Typically, begin treatment with eye drops. If these don't work or more advanced treatment is needed, may suggest one of the following treatments



Medications



Several medicines designed to reduce IOP are  available. These medicines are available in the form of eye drops or pills, but the drops are more common.

Surgery



if a blocked or slow channel is causing increased IOP, surgery to make a drainage path for fluid or destroy tissues that are responsible for the increased fluid. □

Surgery

Treatment for angle-closure glaucoma is different. This type of glaucoma is a medical emergency and requires immediate treatment to reduce eye pressure as quickly as possible. Medicines are usually attempted first, to reverse the angle closure, but this may be unsuccessful. A laser procedure called laser peripheral iridotomy may also be performed. This procedure creates small

holes in iris to allow for increased fluid movement.

Prevention of Glaucoma

Glaucoma can't be prevented, but it's still important to catch it early so you can begin treatment that will help prevent it from getting worse. The best way to catch any type of glaucoma early is to have an annual preventive eye care appointment. Make an appointment with an ophthalmologist. Simple tests performed during these routine eye checks may be able to detect damage from glaucoma before it advances and begins causing vision loss

Will a Person with Glaucoma Go Blind?

If your increased IOP can be stopped and the pressure returned to normal, vision loss can be slowed or even stopped. However, because there's no cure for glaucoma, you'll likely need treatment for the rest of your life to regulate your IOP. Unfortunately, vision lost as a result of glaucoma cannot be restored.



Cataract

Cataract



clouding of the lens in the eye which leads to a decrease in vision . Cataracts often develop slowly and can affect one or both eyes.

Symptoms

faded colors
blurry or double vision,
halos around light,
trouble with bright lights,
and trouble seeing at night. This may result in
trouble driving, reading, or recognizing faces.
Poor vision caused by cataracts may also result
in an increased risk of falling and depression

Risk factors

Cataracts are most commonly due to aging but ☐ may also occur due to trauma or radiation exposure, be present from birth, or occur following eye surgery for other problems. diabetes, smoking tobacco, prolonged exposure to sunlight, and alcohol.

The underlying mechanism involves accumulation ☐ of clumps of protein or yellow–brown pigment in the lens that reduces transmission of light to the retina at the back of the eye.

Prevention

wearing sunglasses and avoiding smoking. Early on the symptoms may be improved with glasses. If this does not help, surgery to remove the cloudy lens and replace it with an artificial lens is the only effective treatment. Surgery is needed only if the cataracts are causing problems and generally results in an improved quality of life. Cataract surgery is not readily available in many countries, which is especially true for women, those living in rural areas, and those who do not know how to read. □

Causes •

Age ☐

Trauma ☐

Genetics ☐

Skin diseases ☐

Radiation ☐

Inadequate vitamin C ☐

Medications ☐

Classification

1. **Nuclear sclerosis** : is the most common type of cataract, and involves the central or 'nuclear' part of the lens. This eventually becomes hard, or 'sclerotic', due to condensation on the lens nucleus and the deposition of brown pigment within the lens. In its advanced stages it is called a brunescent cataract. In early stages, an increase in sclerosis cause an increase in refractive index of the lens. This causes a myopic shift (lenticular shift) that decreases hyperopia and enables presbyopic patients to see at near without reading glasses. This is only temporary and is called **second sight**.

Classification

- 2 - Cortical cataracts are due to the lens cortex (outer layer) becoming opaque. They occur when changes in the fluid contained in the periphery of the lens causes fissuring. When these cataracts are viewed through an ophthalmoscope, or other magnification system, the appearance is similar to white spokes of a wheel. Symptoms often include problems with glare and light scatter at night. - □

Classification

- □

3- Posterior sub capsular cataracts are cloudy at the back of the lens adjacent to the capsule (or bag) in which the lens sits. Because light becomes more focused toward the back of the lens, they can cause disproportionate symptoms for their size. □





Cortical Cataract - Dr MBOUSSOU Yoan



Blepharitis

Blepharitis



is one of the most common ocular conditions characterized by inflammation, scaling, reddening, and crusting of the eyelid. This condition may also cause burning, itching, or a grainy sensation when introducing foreign objects or substances to the eye.

Blepharitis

Although blepharitis is not sight-threatening, it can lead to permanent alterations of the eyelid margin . The overall etiology is a result of bacteria and inflammation from congested meibomian oil glands at the base of each eyelash. Other conditions may give rise to blepharitis, whether they be infectious or noninfectious, including, but not limited to, bacterial infections or allergies.

Signs and symptoms

Watery eyes - due to excessive tearing.

Red eyes - due to dilated blood vessels on the sclera. •

Swollen eyelids - due to inflammation. •

Crusting at the eyelid margins/base of the eyelashes/medial canthus, generally worse on waking - due to excessive bacterial buildup along the lid margins. •

Eyelid sticking - due to crusting along the eyelid margin. •

Eyelid itching - due to the irritation from inflammation and epidermis scaling of the eyelid. •

Flaking of skin on eyelids - due to tear film suppressed by clogged meibomian glands. •

Associated Symptoms

- Gritty/burning sensation in the eye, or foreign-body sensation - due to crusting from bacteria and clogged oil glands ••
- Frequent blinking - due to impaired tear film from clogged oil glands unable to keep tears from evaporating. •
- Light sensitivity/photophobia •
- Misdirected eyelashes that grow abnormally - due to permanent damage to the eyelid margin •
- Eyelash loss - due to excessive buildup of bacteria along the base of the eyelashes. •
- Infection of the eyelash follicle/sebaceous gland (hordeolum) •



Prevention

Blepharitis is a result of bacteria and inflammation from congested meibomian oil glands at the base of each eyelash. Routine washing of the eyelids helps subdue symptoms and prevent blepharitis. Washing each eyelid for 30 seconds, twice a day, with a single drop of hypoallergenic soap (e.g. baby shampoo) and ample water can help. The most effective treatment is over the counter lid scrubs used twice a day. Some doctors may recommend using a hypochloric acid treatment depending on the severity.

Treatment

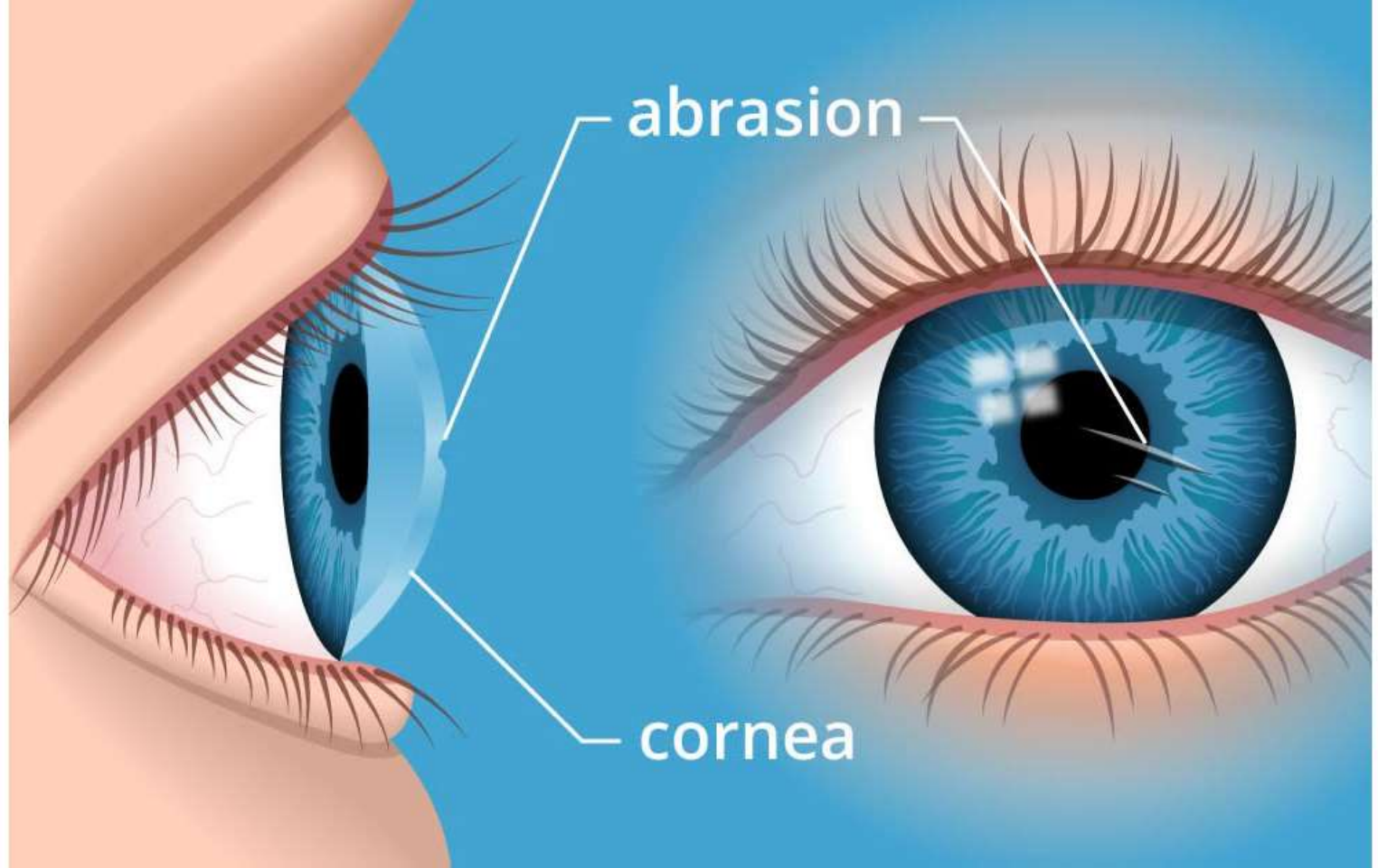
Blepharitis is a chronic condition causing frequent exacerbation, thus requiring routine eyelid hygiene. Hygienic practices include warm compresses, eyelid massages, and eyelid scrubs. A Cochrane Systematic Review found topical antibiotics to be effective in providing symptomatic relief and clearing bacteria for individuals with anterior blepharitis. Topical steroids provided some symptomatic relief, but they were ineffective in clearing bacteria from the eyelids. Lid hygiene measures such as warm compresses and lid scrubs were found to be effective in providing symptomatic relief for participants with anterior and posterior blepharitis. Ophthalmologists or optometrists may prescribe a low-dose, oral antibiotic such as Doxycycline.

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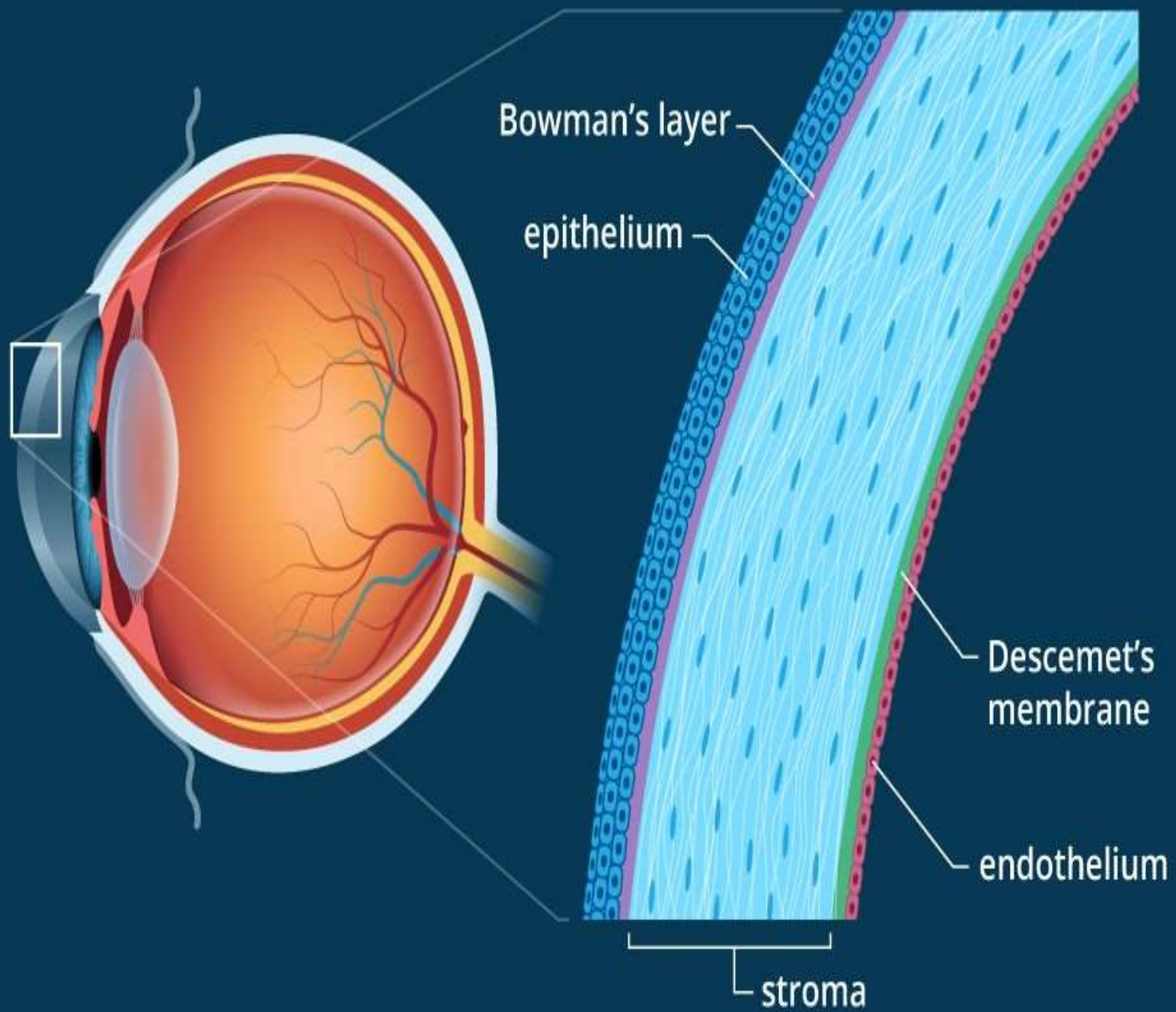
Prognosis

Blepharitis is a chronic condition that has periods of exacerbation and remission. Patients should be informed that symptoms can frequently improve but are rarely eliminated. Infrequently, severe blepharitis can result in permanent alterations in the eyelid margin or vision loss from superficial keratopathy, corneal neovascularization, and ulceration. Patients with an inflammatory eyelid





Cornea



Cornea

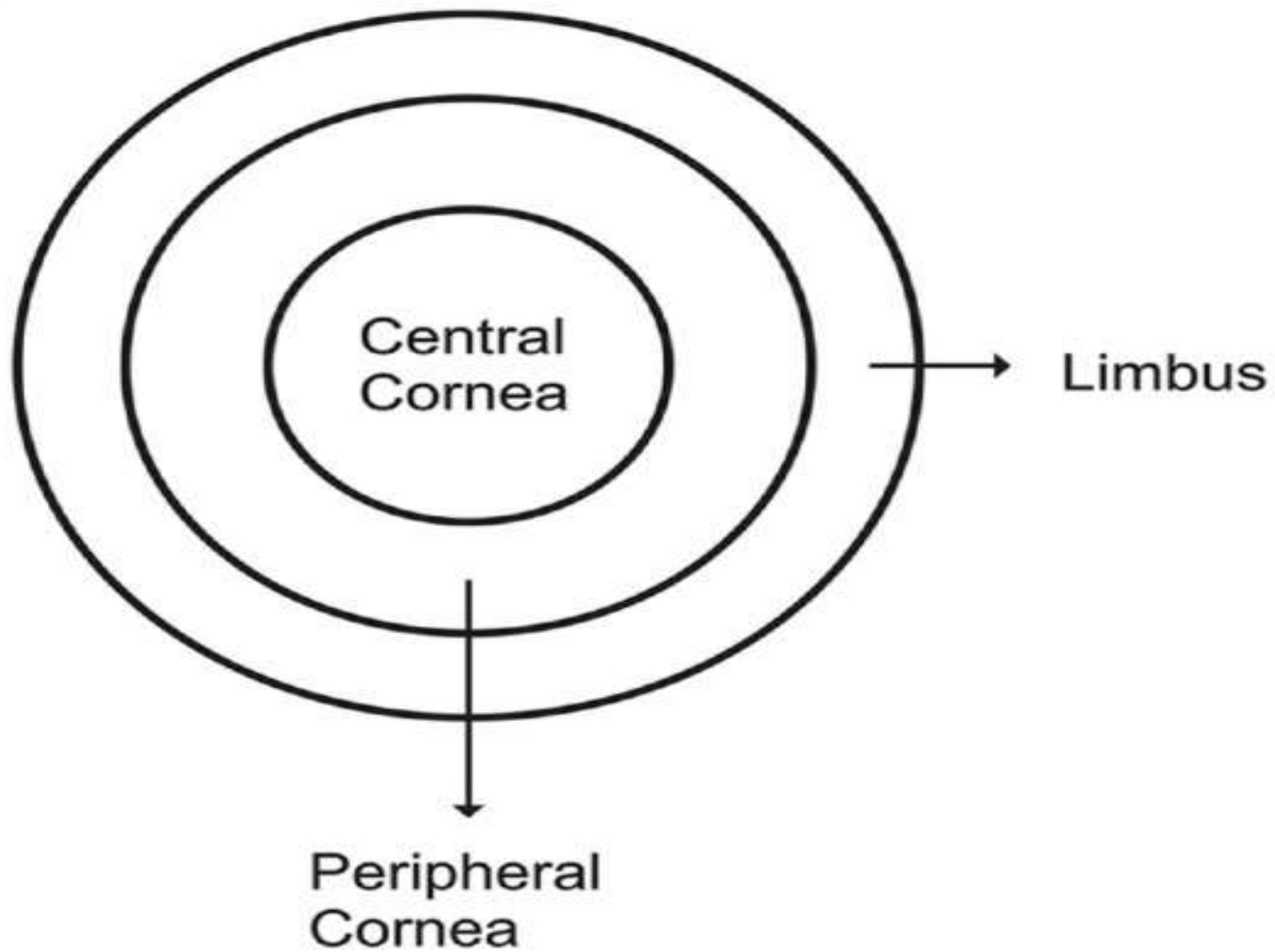
- dome-shaped transparent membrane about 12 mm (0.5 inch) in diameter that covers the front part of the eye. Except at its margins, the cornea contains no blood vessels, but it does contain many nerves and is very sensitive to pain or touch..

Cornea

It is nourished and provided with oxygen anteriorly □ by tears and is bathed posteriorly by aqueous humour. It protects the pupil, the iris, and the inside of the eye from penetration by foreign bodies and is the first and most powerful element in the eye's focusing system. As light passes through the cornea, it is partially refracted before reaching the lens.

Cornea

The curvature of the cornea, which is □ spherical in infancy but changes with age, gives it its focusing power; when the curve becomes irregular, it causes a focusing defect called astigmatism, in which images appear elongated or distorted.



CORNEALLAYERS



Corneal epithelium

Bowman's layer

Corneal stroma

Descemet's membrane

Corneal endothelium

Corneal epithelium

an exceedingly thin multicellular epithelial tissue layer □
(non-keratinized stratified squamous epithelium) of
fast-growing and easily regenerated cells, kept moist
with tears. Irregularity or edema of the corneal
epithelium disrupts the smoothness of the air/tear-film
interface, the most significant component of the total
refractive power of the eye, thereby reducing visual
acuity. It is continuous with the conjunctival
epithelium, and is composed of about 6 layers of cells
which are shed constantly on the exposed layer and are
regenerated by multiplication in the basal layer.

Bowman's layer

(also known as the *anterior limiting membrane*): when discussed in lieu of a sub epithelial basement membrane, Bowman's Layer is a tough layer composed of collagen (mainly type I collagen fibrils), laminin, nidogen, perlecan and other HSPGs that protects the corneal stroma. When discussed as a separate entity from the subepithelial basement membrane, Bowman's Layer can be described as an acellular, condensed region of the apical stroma, composed primarily of randomly organized yet tightly woven collagen fibrils. These fibrils interact with and attach onto each other. This layer is eight to 14 micrometres (μm) thick¹ and is absent or very thin in non-primates

Corneal stroma

(also *substantia propria*): a thick, transparent middle layer, consisting of regularly arranged collagen fibers along with sparsely distributed interconnected keratocytes, which are the cells for general repair and maintenance. They are parallel and are superimposed like book pages. The corneal stroma consists of approximately 200 layers of mainly type I collagen fibrils. Each layer is 1.5-2.5 μm . Up to 90% of the corneal thickness is composed of stroma

2 theories of how transparency in the cornea comes about:

- The lattice arrangements of the collagen fibrils in the stroma. The light scatter by individual fibrils is cancelled by destructive interference from the scattered light from other individual fibrils .1
- The spacing of the neighboring collagen fibrils in the stroma must be < 200 nm for there to be transparency. .2

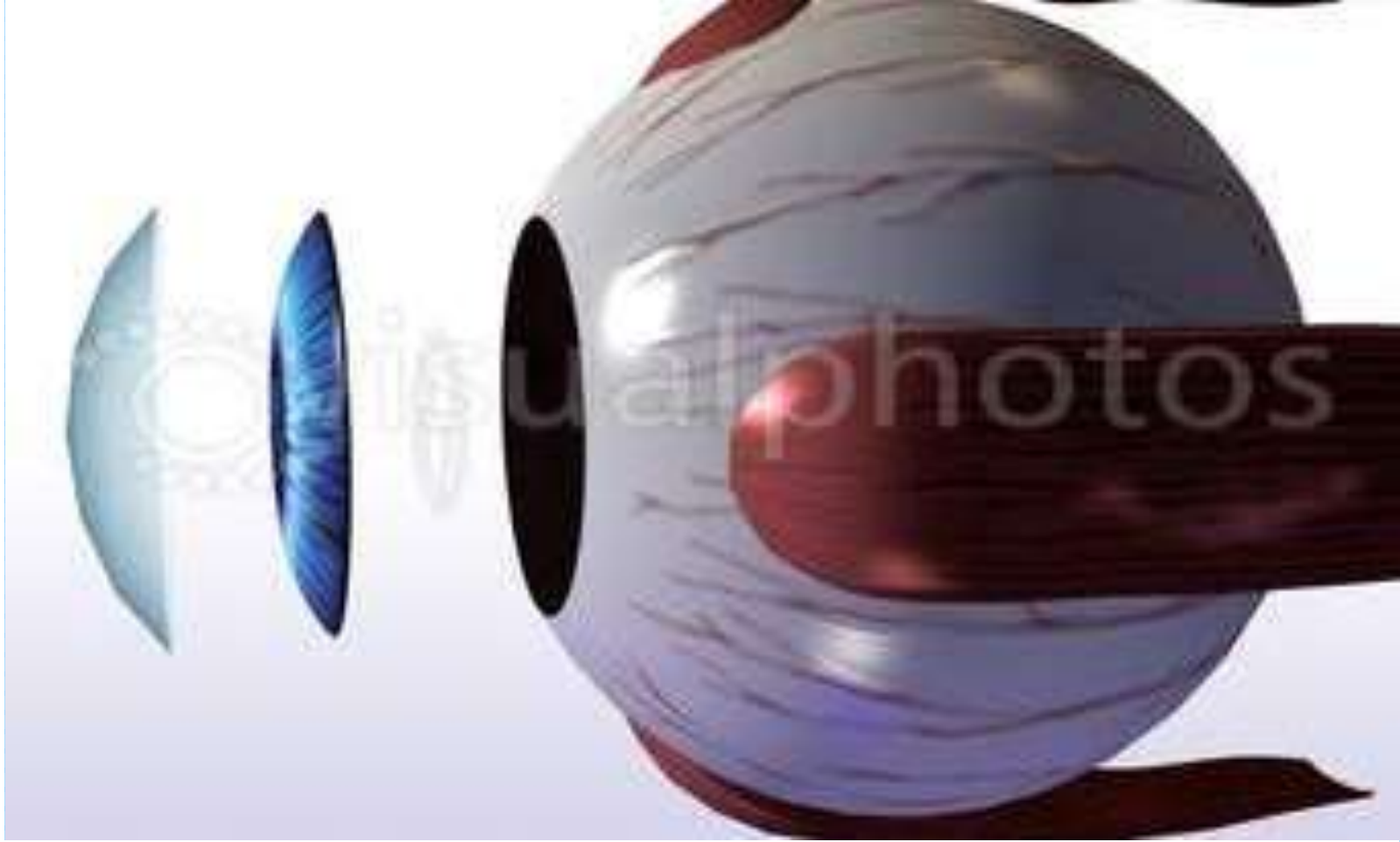
Descemet's membrane

(also *posterior limiting membrane*): a thin acellular □ layer that serves as the modified basement membrane of the corneal endothelium, from which the cells are derived. This layer is composed mainly of collagen type IV fibrils, less rigid than collagen type I fibrils, and is around 5-20 μm thick, depending on the subject's age. Just anterior to Descemet's membrane, a very thin and strong layer, Dua's layer, 15 microns thick and able to withstand 1.5 to 2 bars of pressure

Corneal endothelium:

a simple squamous or low cuboidal monolayer, □
approx 5 μm thick, of mitochondria-rich cells.


These cells are responsible for regulating fluid and solute transport between the aqueous and corneal stromal compartments



TERMINOLOGY

GLOSSARY OF EYE TERMINOLOGY



Common terms, tests, treatments, 
diseases & conditions, anatomy --
These definitions may help you
understand them better .

Ectropion

Outward turning of the upper or lower eyelid so that the lid margin does not rest against the eyeball, but falls or is pulled away. Can create corneal exposure with excessive drying, tearing, and irritation. Usually from aging □



En tropion

Inward turning of upper or lower eyelid so that the lid margin rests against and rubs the eyeball □



Exotropia



cross-eyes misalignment in which one eye deviates outward (outside) while the other fixates normally □

Eso tropia

cross-eyes misalignment in which one eye deviates □
inward (toward nose) while the other fixates
normally



A. Right esotropia



B. Right exotropia

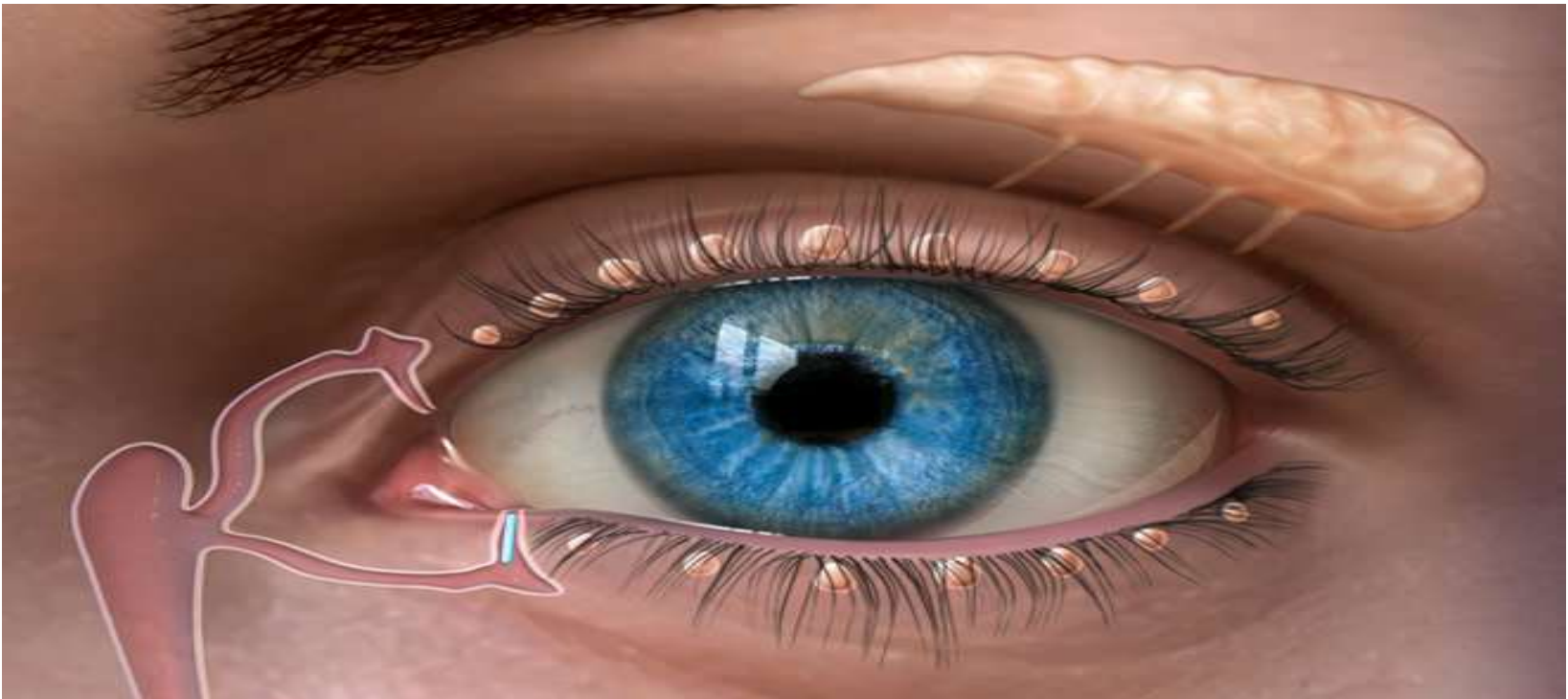
Convergence

Inward movement of both eyes toward each other, usually in an effort to maintain single binocular vision as an object approaches □



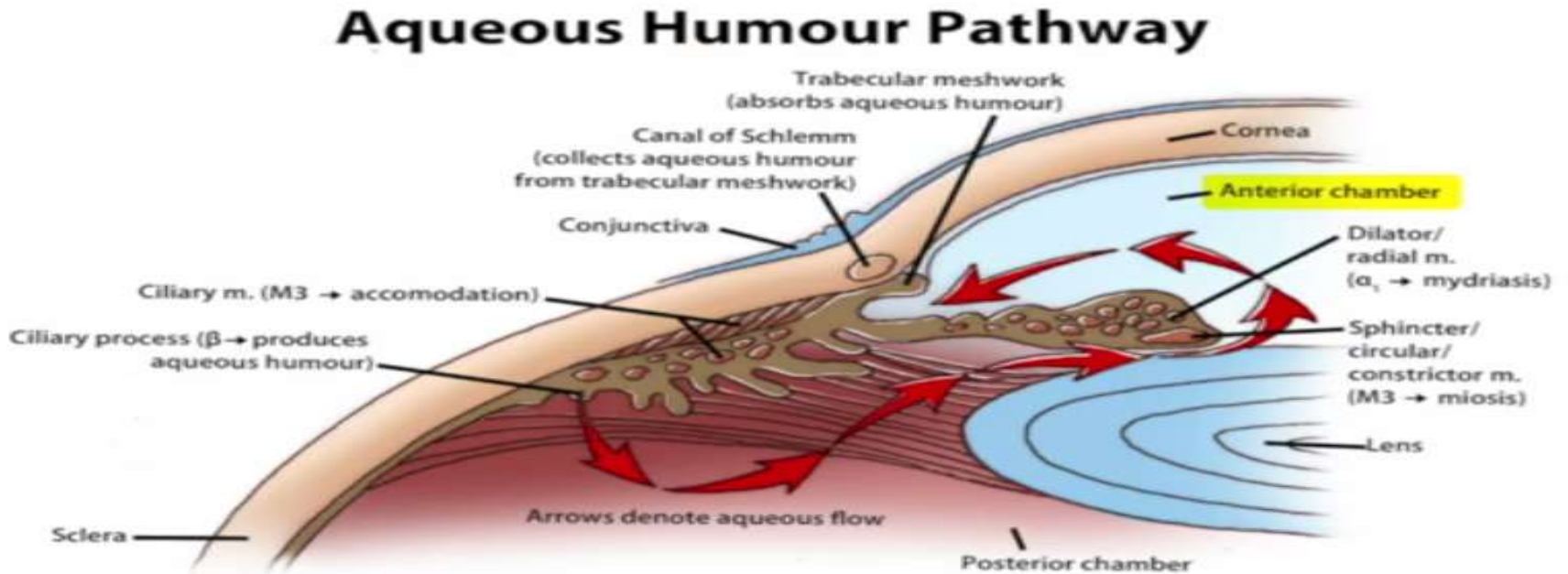
Lacrimal gland

Almond-shaped structure that produces tears. □
Located at the upper outer region of the orbit, above the eyeball



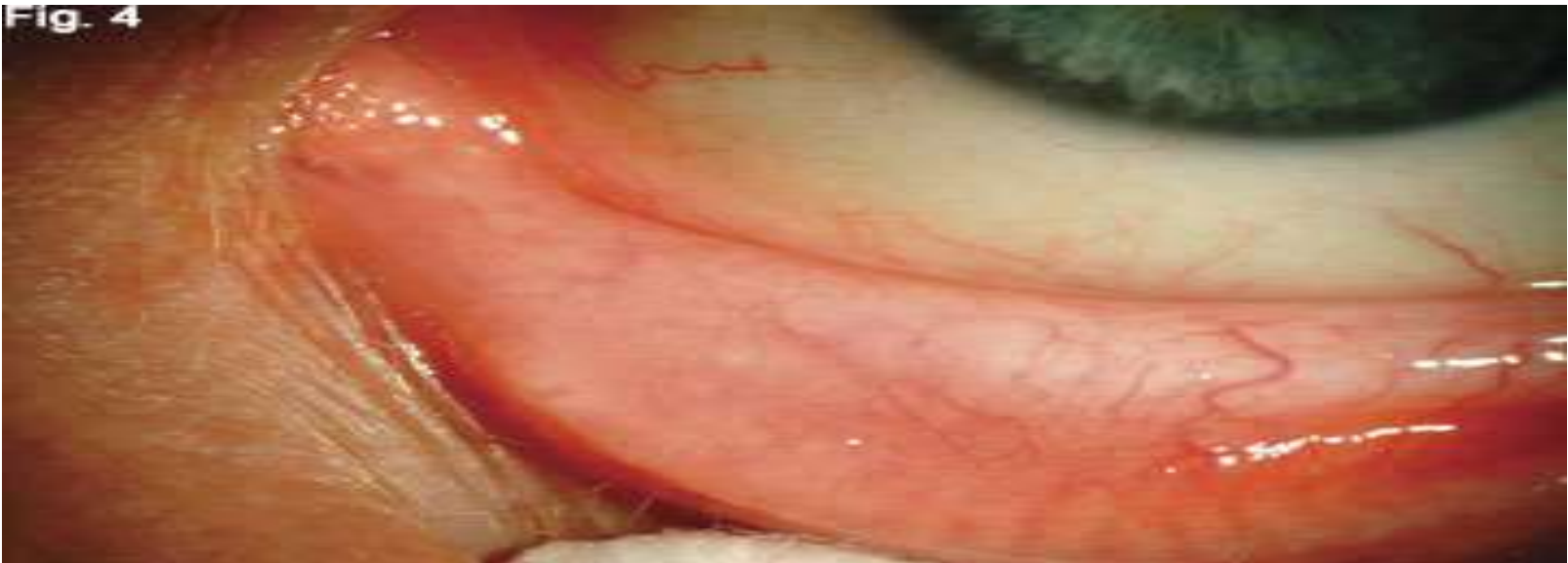
Schlemm's canal

Circular channel deep in corneoscleral junction (limbus) that carries aqueous fluid from the anterior chamber of the eye to the bloodstream



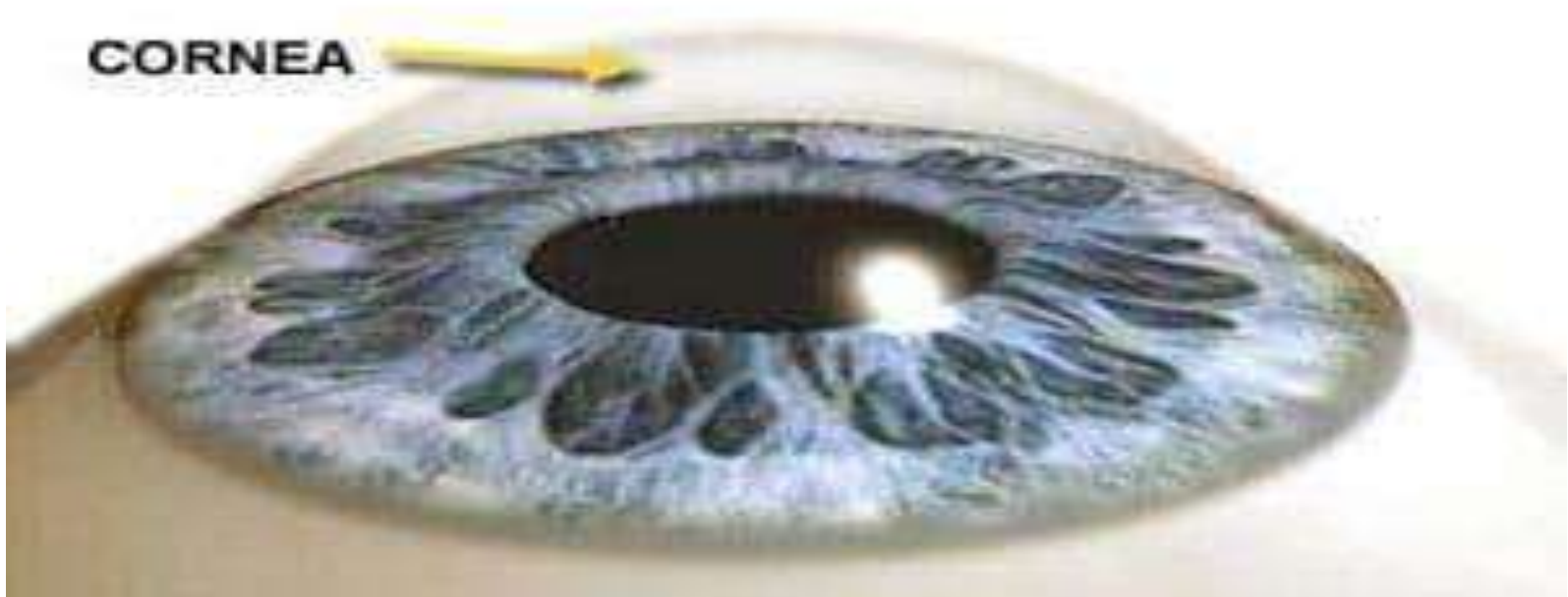
Conjunctiva

Transparent mucous membrane covering the outer surface of the eyeball except the cornea, and lining the inner surfaces of the eyelids □



Cornea

Transparent front part of the eye that covers the iris, pupil, and anterior chamber and provides most of an eye's optical power □



Sclera Opaque

fibrous, protective outer layer of the eye ("white of the eye") that is directly continuous with the cornea in front and the sheath covering optic nerve behind



Conjunctivitis

"pink eye." Inflammation of the conjunctiva. □
Characterized by discharge, redness and swelling.
Usually viral in origin , but may be bacterial or
allergic; may be contagious.



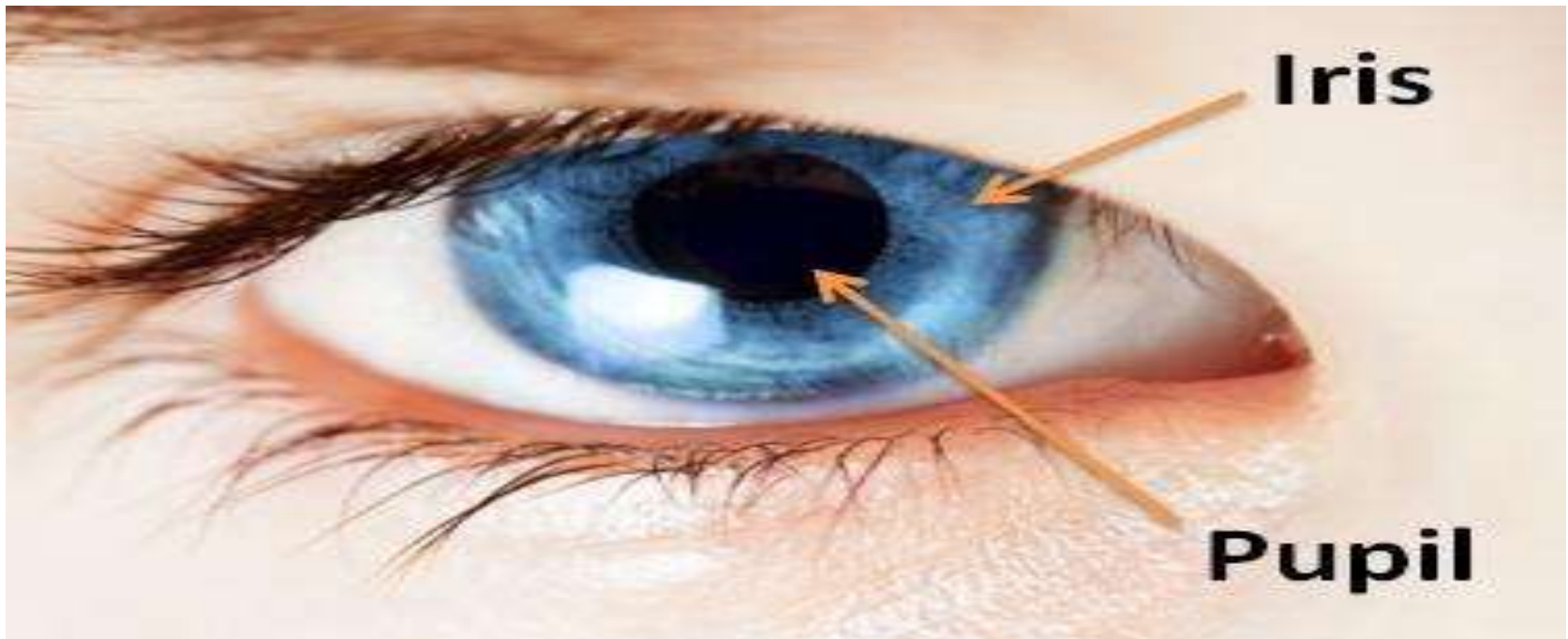
Iris

Pigmented tissue lying behind the cornea that gives color to the eye (e.g., blue eyes) and controls amount of light entering the eye by varying the size of the pupillary opening □



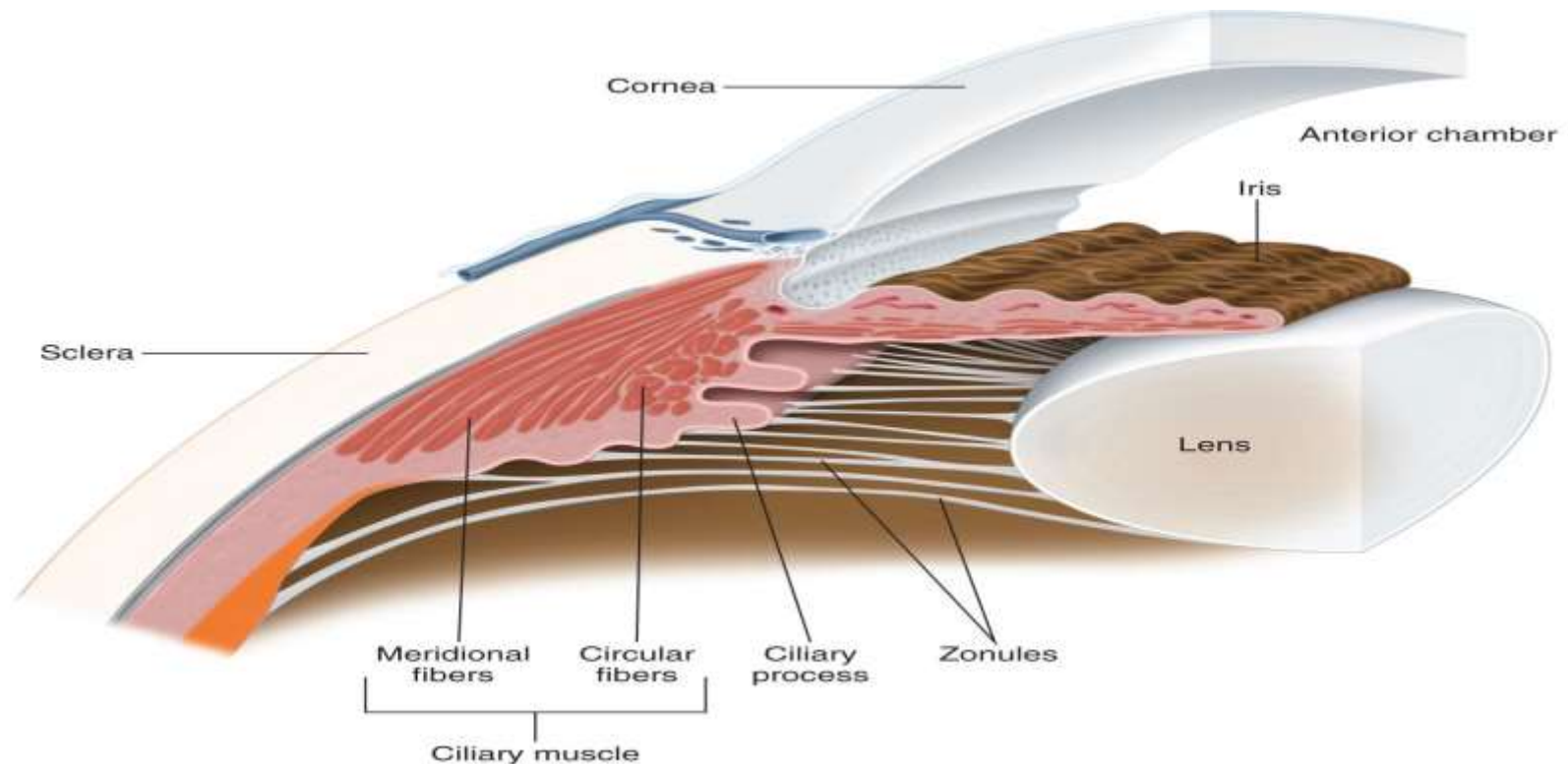
Pupil

Variable-sized black circular opening in the center of the iris that regulates the amount of light that enters the eye. □



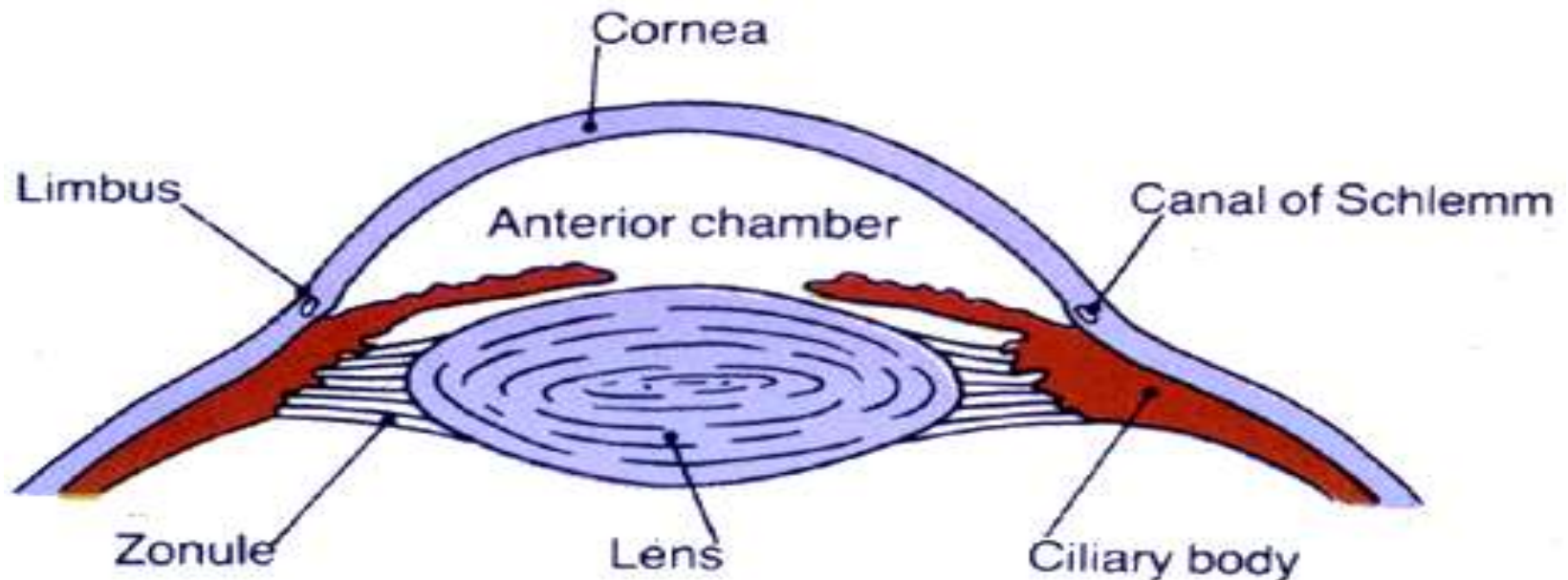
Zonules

Radially arranged fibers that suspend the lens from the ciliary body and hold it in position □



Anterior chamber

Fluid-filled space inside the eye between the iris and the innermost corneal surface




Lens



crystalline lens The eye's natural lens. Transparent, biconvex intraocular tissue that helps bring rays of light to a focus on the retina □

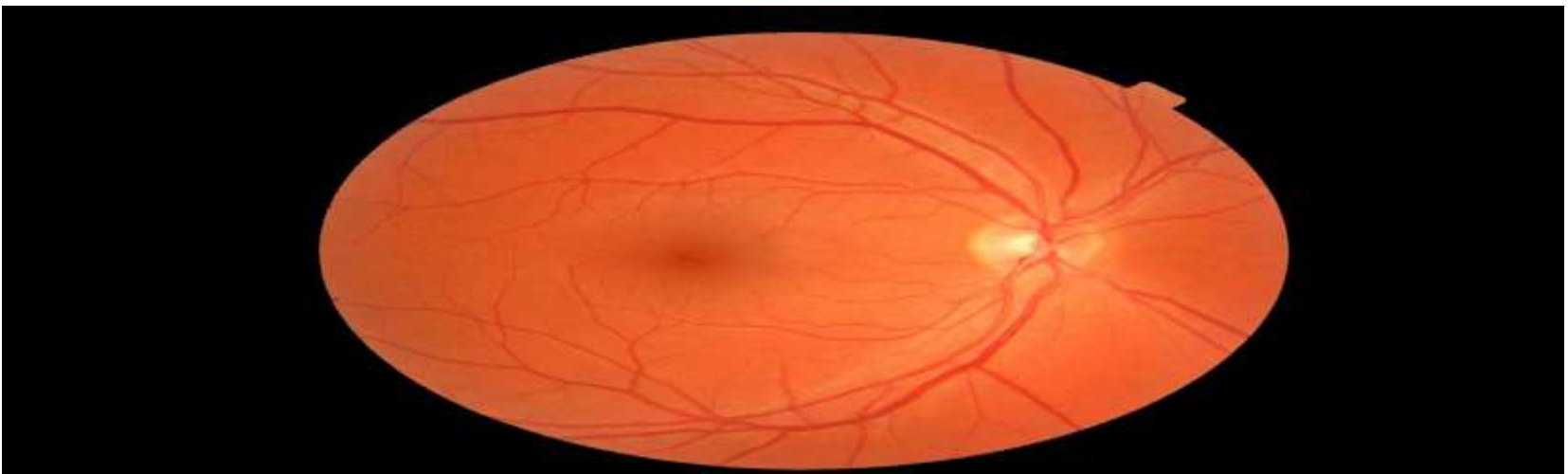
Aqueous

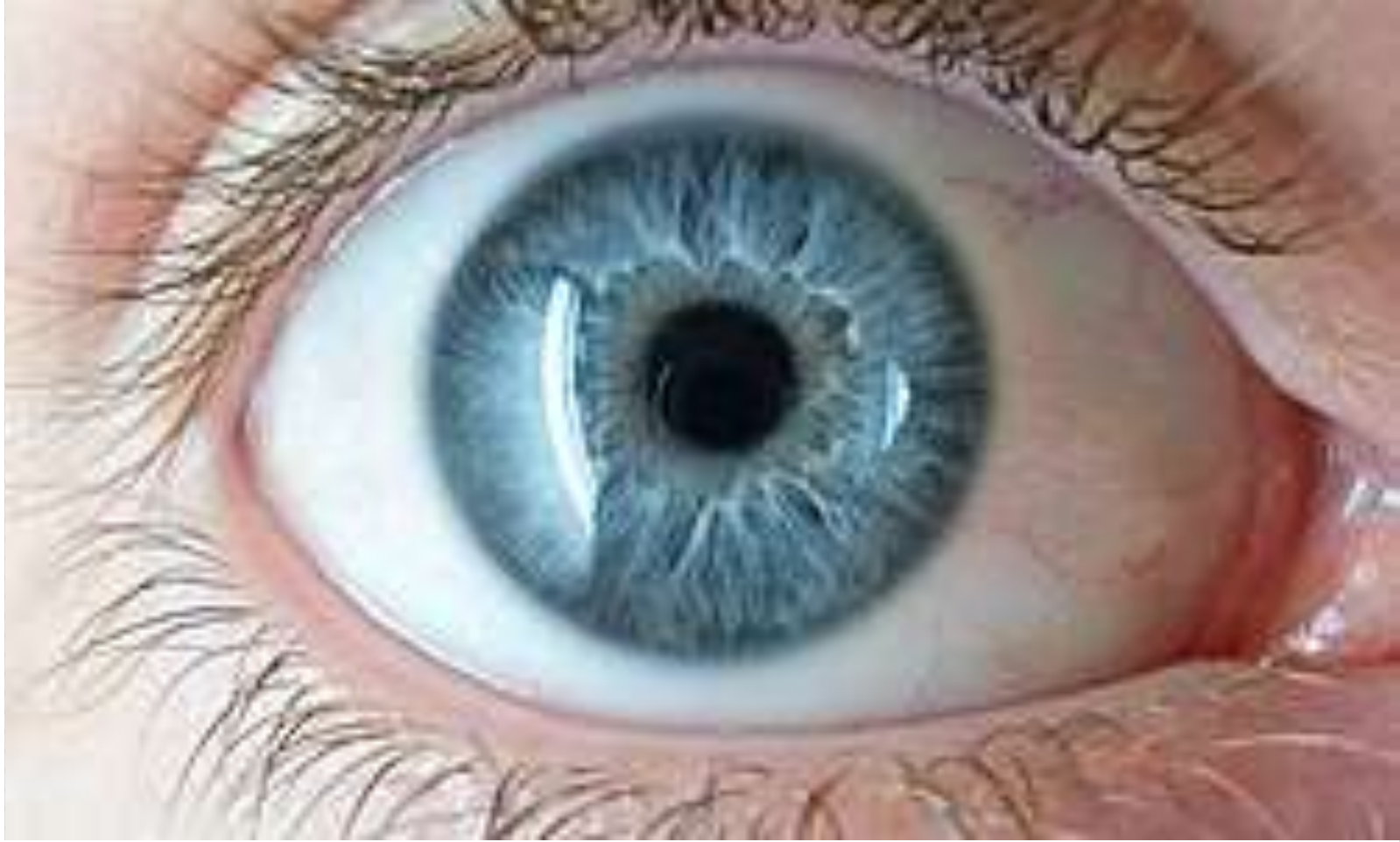


aqueous humor Clear, watery fluid that fills the 
cornea and space between the back surface of the
the front surface of the

Retina

Light sensitive nerve tissue in the eye that converts images from the eye's optical system into electrical impulses - that are sent along the optic nerve to the brain. Forms a thin membranous lining of the rear two-thirds of the globe □

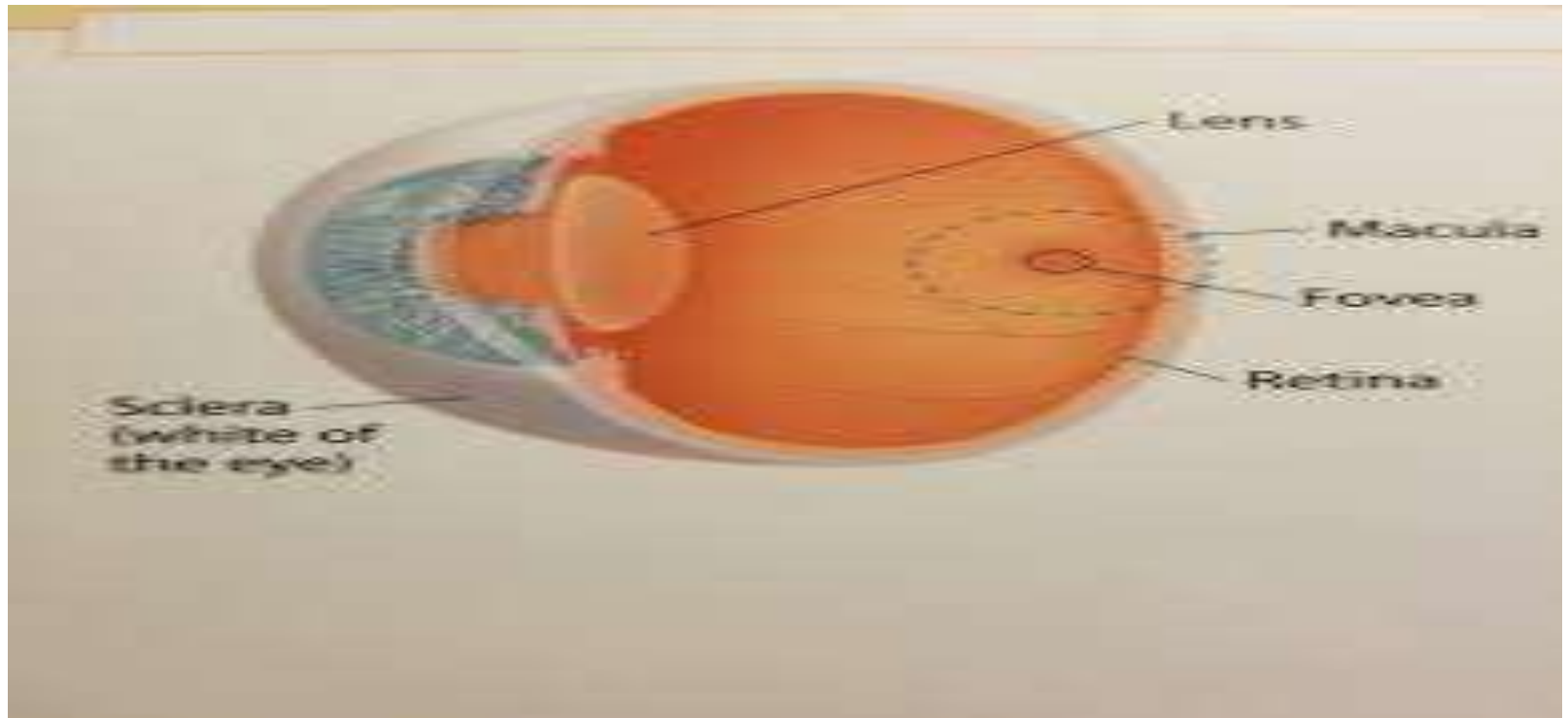




TERMINOLOGY 2

Macula

Macula Small central area of the retina surrounding the fovea; area of acute central vision □



Optic disc

Optic disc, Ocular end of the optic nerve. □

Denotes the exit of retinal nerve fibers from the eye and entrance of blood vessels to the eye



Optic nerve

Optic nerve Largest sensory nerve of the eye; □ carries impulses for sight from the retina to the brain



Uvea

Uvea, uveal tract Pigmented layers of the eye □
(iris, ciliary body, choroid) that contain most
of the intraocular blood vessels

Vitreous

Vitreous , vitreous humor Transparent, □
colorless gelatinous mass that fills the rear
two-thirds of the eyeball, between the lens and
the retina

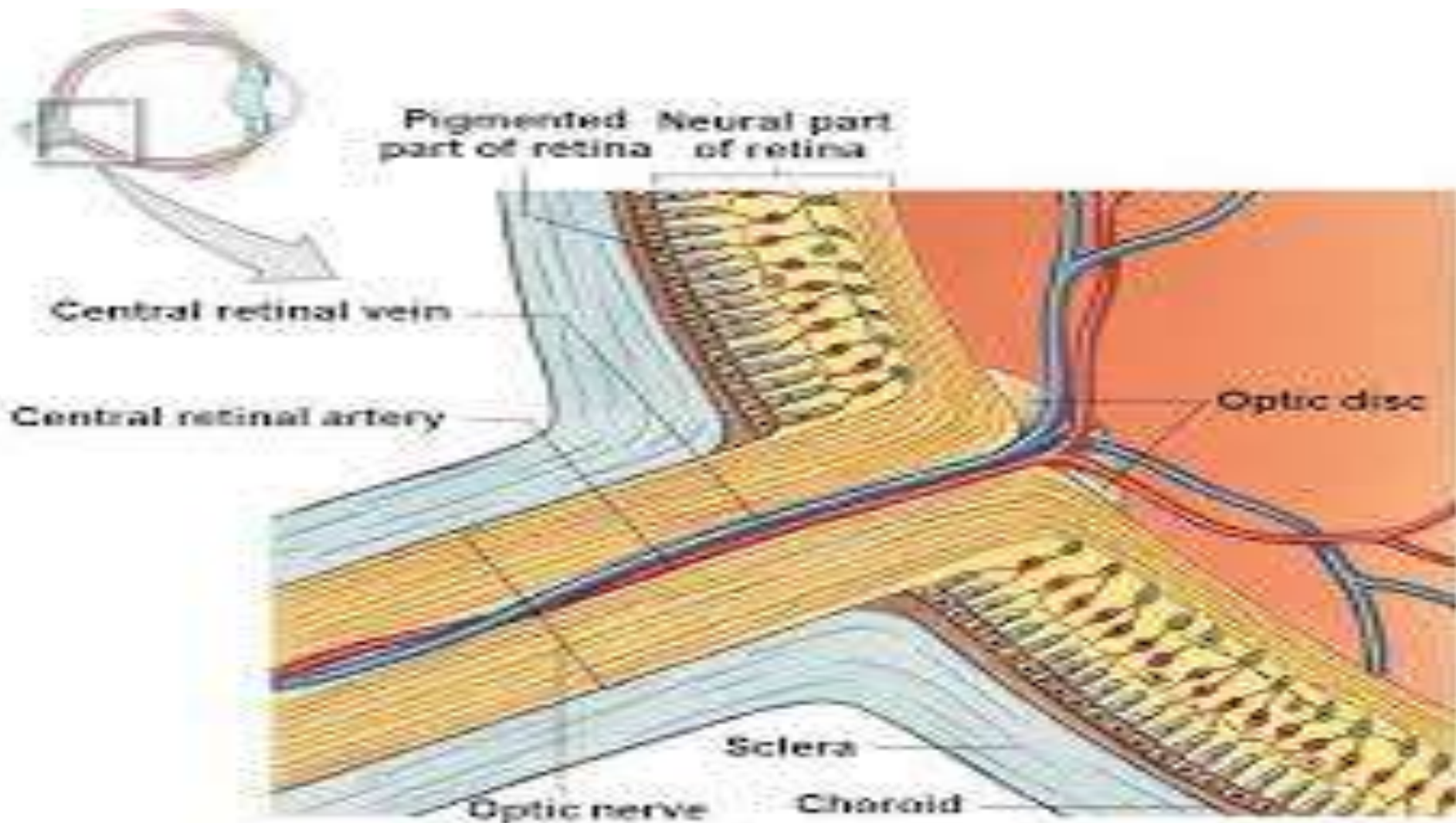
Central retinal artery

Central retinal artery First branch of the ☐
ophthalmic artery; supplies nutrition to the
inner two-thirds of the retina

Central retinal vein

Central retinal vein Blood vessel that collects ☐ retinal venous blood drainage; exits the eye through the optic

vein7Central retinal &rtery




Choroid

Choroid Vascular (major blood vessel) layer of the eye lying between the retina and the sclera. Provides nourishment to outer layers of the retina □

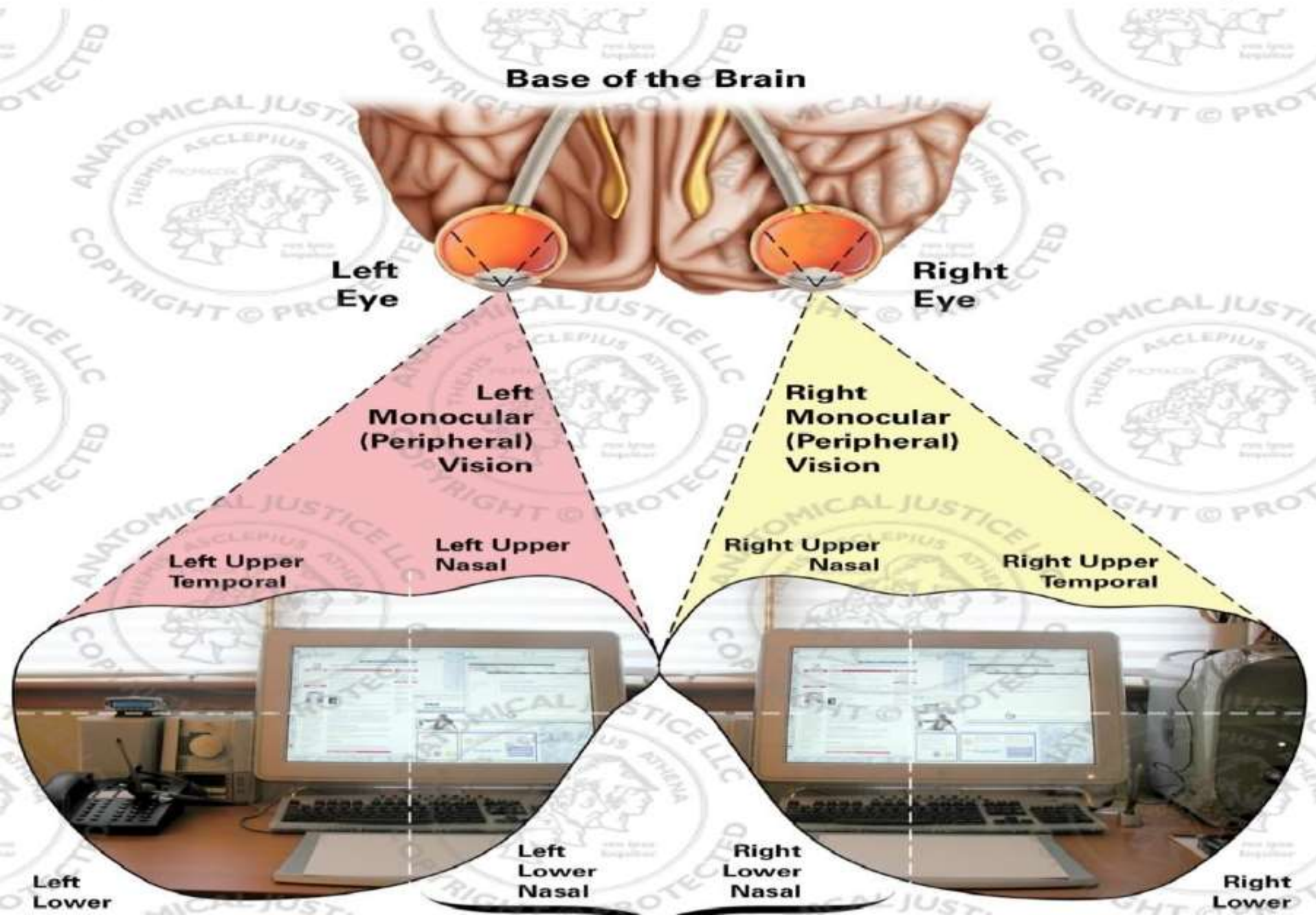
Accommodation

Accommodation Increase in optical power by ☐ the eye in order to maintain a clear image (focus) as objects are moved closer. Occurs through a process of ciliary muscle contraction and zonular relaxation that causes the elastic-like lens to "round up" and increase its optical power. Natural loss of accommodation with increasing age is called presbyopia

Binocular vision

Binocular vision Blending of the separate 
images seen by each eye into one composite
image

Normal Field of Binocular Vision



Central vision

Central vision An eye's best vision; used for ☐ reading and discriminating fine detail and color.. Results from stimulation of the fovea and the macular area



Peripheral vision

Peripheral vision Side vision; vision elicited ☐
by stimuli falling on retinal areas distant from
the macula

Bi focals Eyeglasses

Bifocals Eyeglasses that incorporate two ☐ different powers in each | lens, usually for near and distance corrections



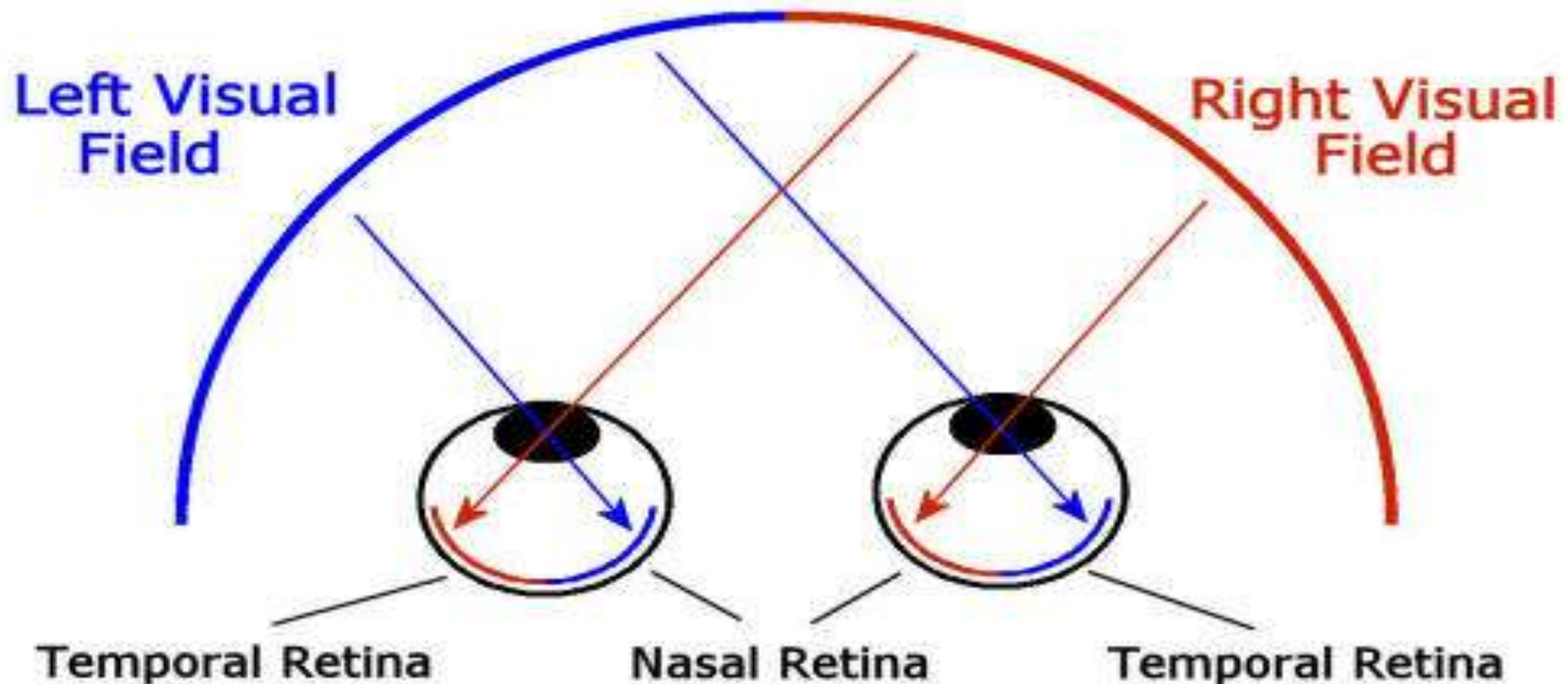
Trifocal Eyeglass

Trifocal Eyeglass lens that incorporates three ☐ lenses of different powers. The main portion is usually focused for distance (20 ft.), the center segment for about 2 ft., and the lower segment for near (14)



Visual field

Visual field Full extent of the area visible to an eye that is fixating straight ahead □



AMD

Age-related macular degeneration (AMD, ARMD) □

Group of conditions that include deterioration of the macula , resulting in loss of sharp central vision. Two general types: "dry," which is more common, and "wet," in which abnormal new blood vessels grow under the retina and leak fluid and blood (neovascularization), further disturbing macular function. Most common cause of decreased vision after age 60

AMD





TERMINOLOGY 3

Aphakia



Aphakia Absence of the eye's crystalline lens, ☐
such as after cataract extraction ☐

Asthenopia

Asthenopia Vague eye discomfort arising from □ use of the eyes; may. consist of eyestrain, headache, and/or brow ache. May be related to uncorrected refractive error or poor fusion amplitudes

Chalazion

Chalazion Inflamed lump in a meibomian gland □ gland (in the eyelid). Inflammation usually subsides, but may need surgical removal. Sometimes called an internal hordeolum



Sty

Sty; styne Acute pustular infection of the oil □
gländs



Stye



Chalazion

Color blindness

Color blindness Reduced ability to ☐ discriminate between colors, especially shades of red and green. Usually hereditary

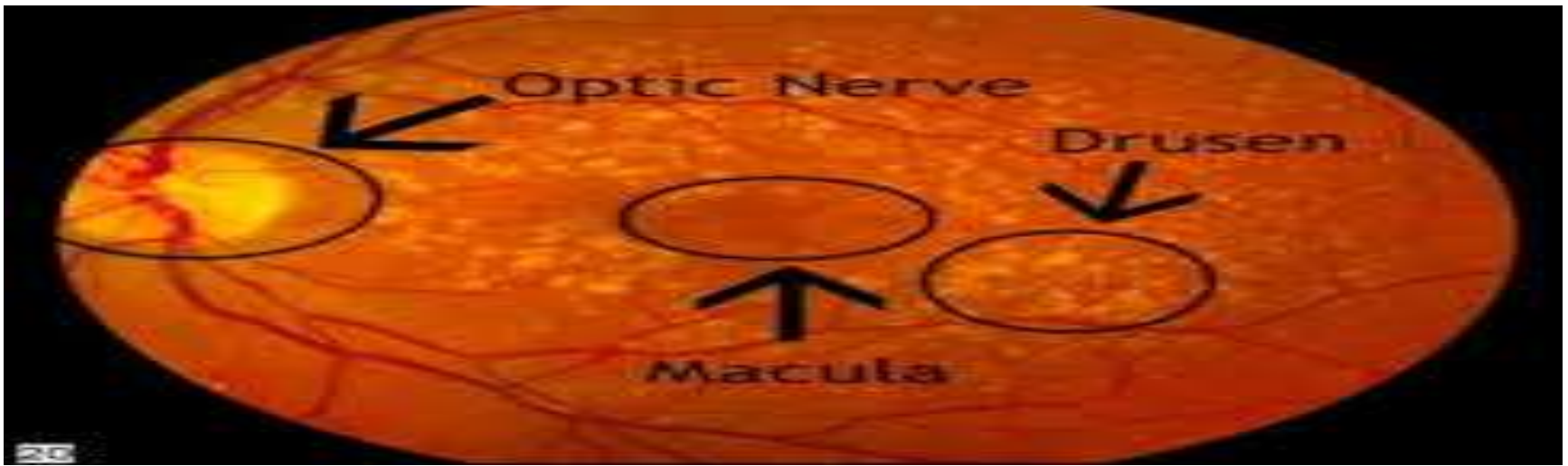


Cycloplegic refraction

Cycloplegic refraction. Assessment of an eye's refractive error after lens accommodation has been paralyzed with cycloplegic eye drops (to eliminate variability in optical power caused by a contracting lens) □

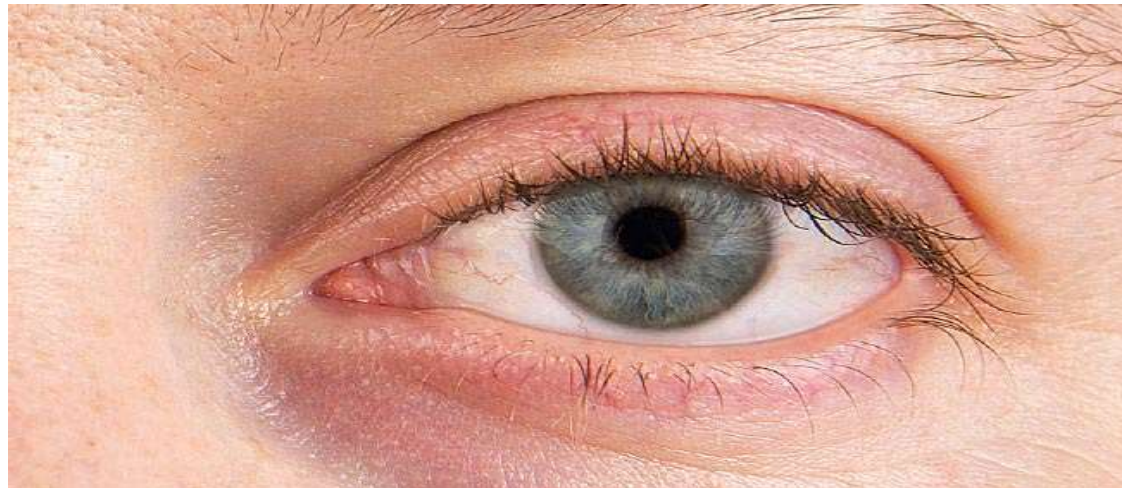
Drusen

Drusen Tiny, white hyaline deposits on ☐ Bruch's membrane (of the retinal pigment epithelium). Common after age 60; sometimes an early sign of macular degeneration



Dry eye syndrome

Dry eye syndrome Corneal and conjunctival □ dryness due to deficient tear production. Can cause foreign body sensation, burning eyes, filamentary keratitis, and erosion of conjunctival and corneal epithelium



Floaters

Floaters Particles that float in the vitreous and cast shadows on the retina; seen as spots, cobwebs, spiders, etc. Occurs normally with aging or with vitreous detachment, retinal tears, or inflammation



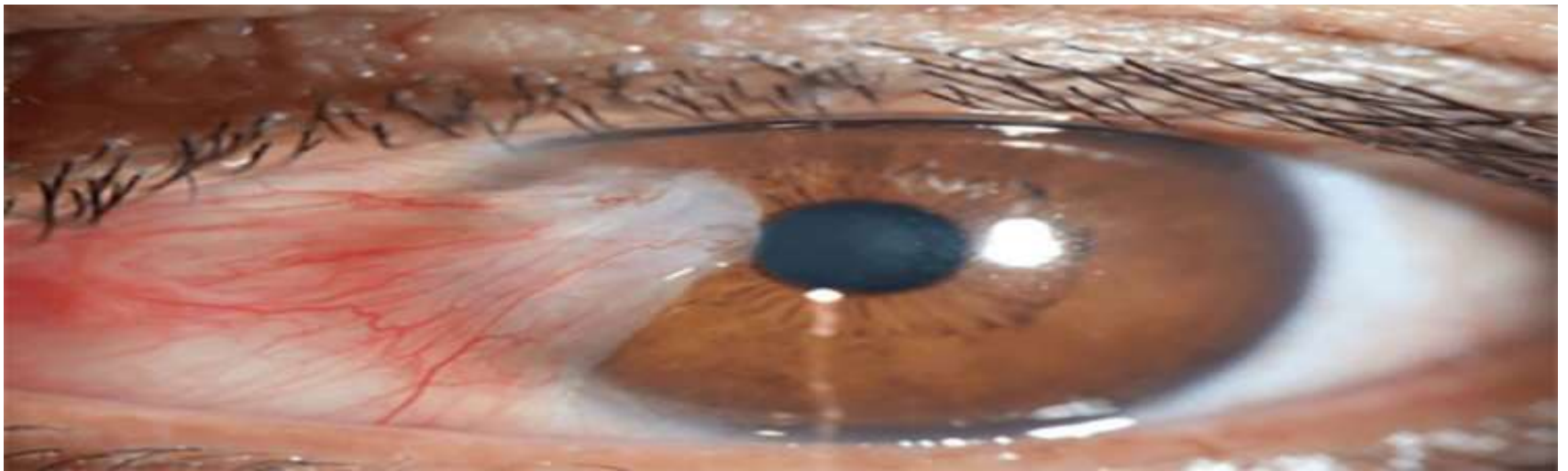
Hyphema

Hyphema Blood in the anterior chamber, such as following blunt trauma to the eyeball □



Pterygium

Pterygium Abnormal wedge-shaped growth on the bulbar conjunctiva. May gradually advance onto the cornea and require surgical removal. Probably related to sun irritation



Ptosis

Ptosis Drooping of upper eyelid. May be ☐ congenital or caused by paralysis or weakness of the 3rd cranial nerve or sympathetic nerves, or by excessive weight of the upper lids



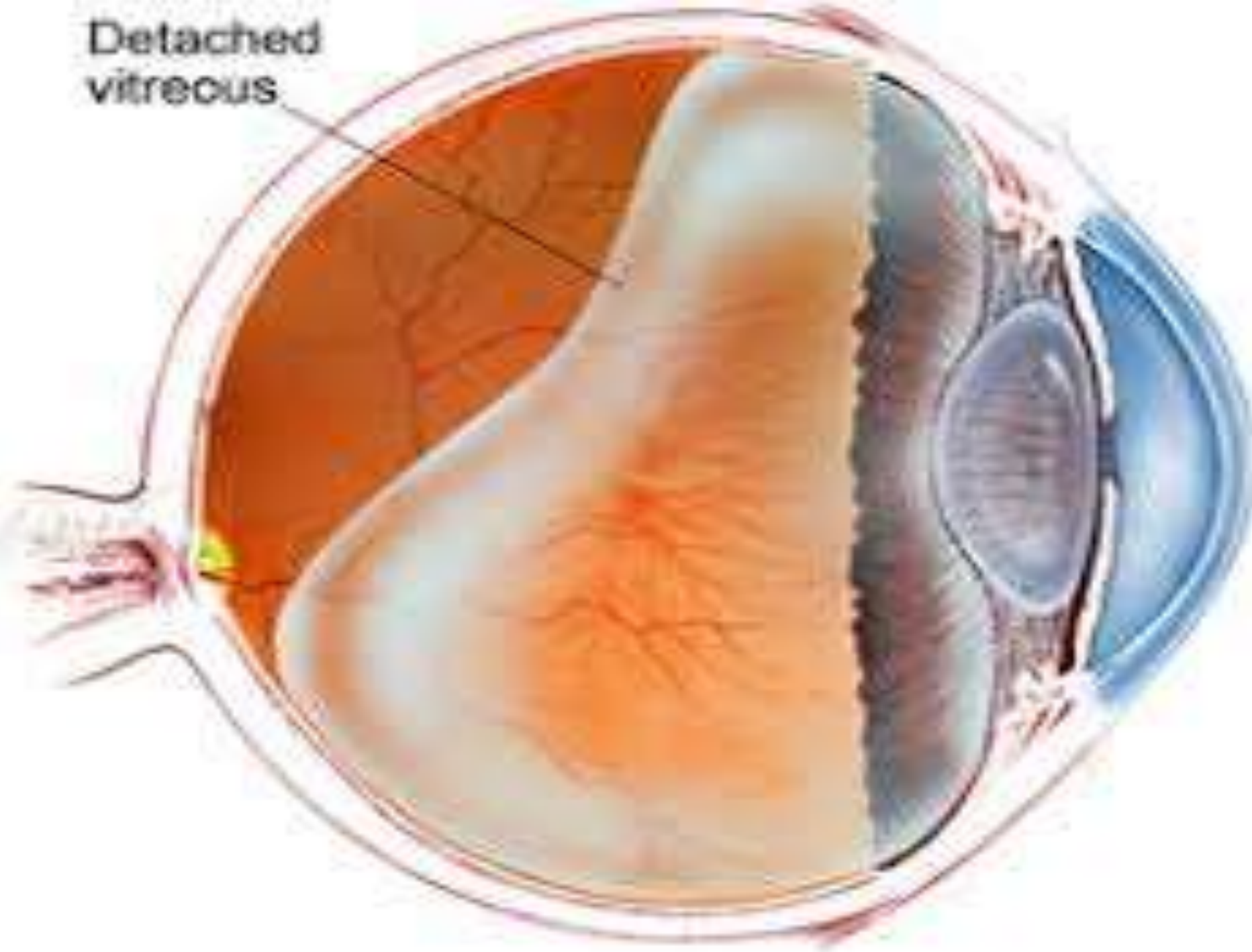
Retinal detachment

Retinal detachment Separation of the retina □ from the underlying pigment epithelium. Disrupts visual cell structure and thus markedly disturbs vision. Almost always caused by a retinal tear; often requires immediate surgical repair

Vitreous detachment

Vitreous detachment Separation of vitreous gel □ from retinal surface. Usually innocuous, but can cause retinal tears, which may lead to retinal detachment. Frequently occurs with aging as the vitreous liquifies, or in some disease states, e.g. diabetes and high myopia

Detached
vitreous



extracapsular cataract

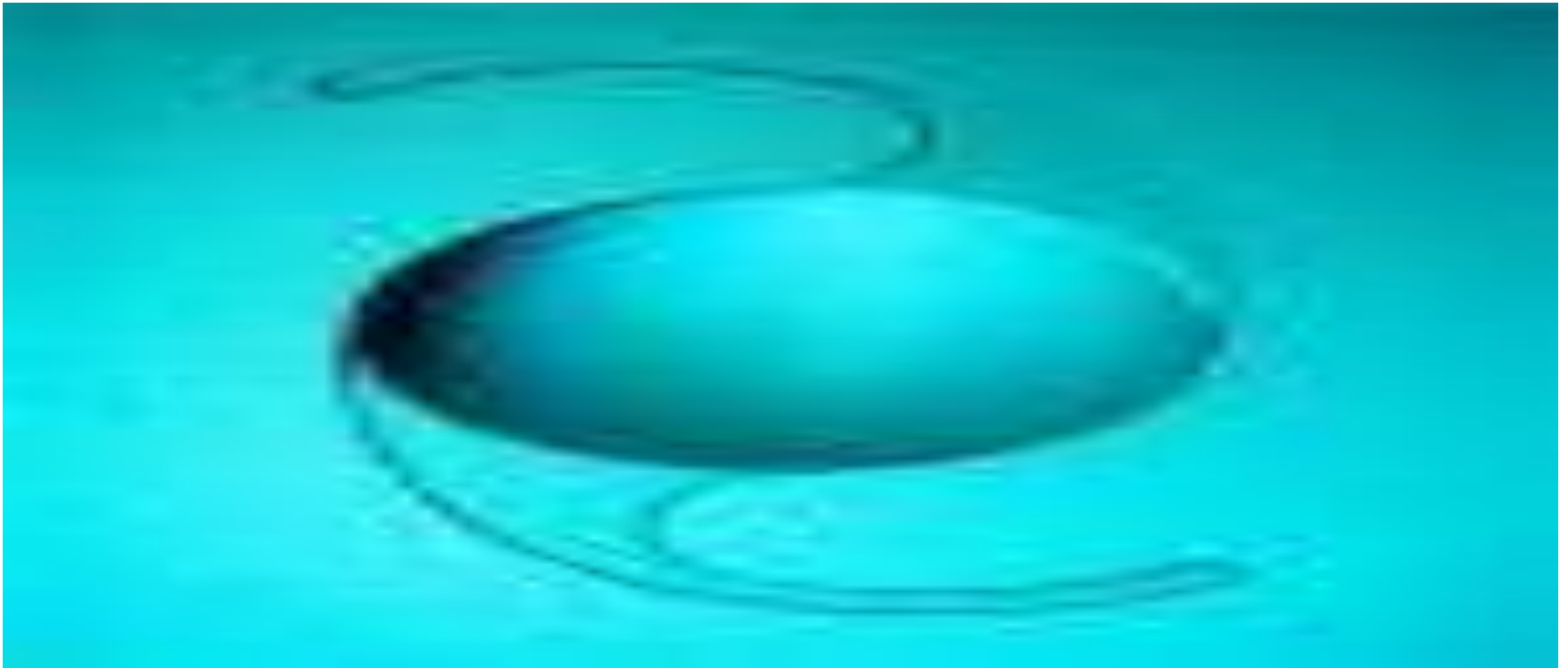
extracapsular cataract extraction leaves the rear lens capsule intact; with an intracapsular extraction there is complete removal of lens with its capsule, usually by cryoextraction □

Phacoemulsification

Phacoemulsification Use of ultrasonic □
vibration to shatter and break up a cataract,
making it easier to remove

IOL

IOL (intraocular lens) Plastic lens that may be ☐ surgically implanted to replace the eye's natural lens



A-scan

A-scan Type of ultrasound, radar-like device □ that emits very high frequency waves that are reflected by the ocular structures and converted into electrical impulses. Used for differentiating normal and abnormal eye tissue or for measuring length of eyeball

B-scan

B-scan Type of ultrasound; provides a cross-section view of tissues that cannot be seen directly. High frequency waves are reflected by eye tissues and orbital structures and converted into electrical pulses, which are displayed on a printout

