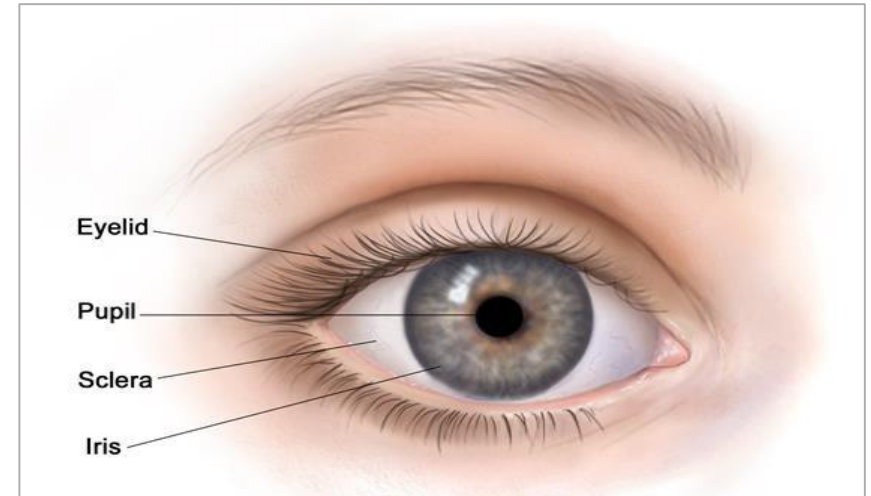


ORBIT & EYE



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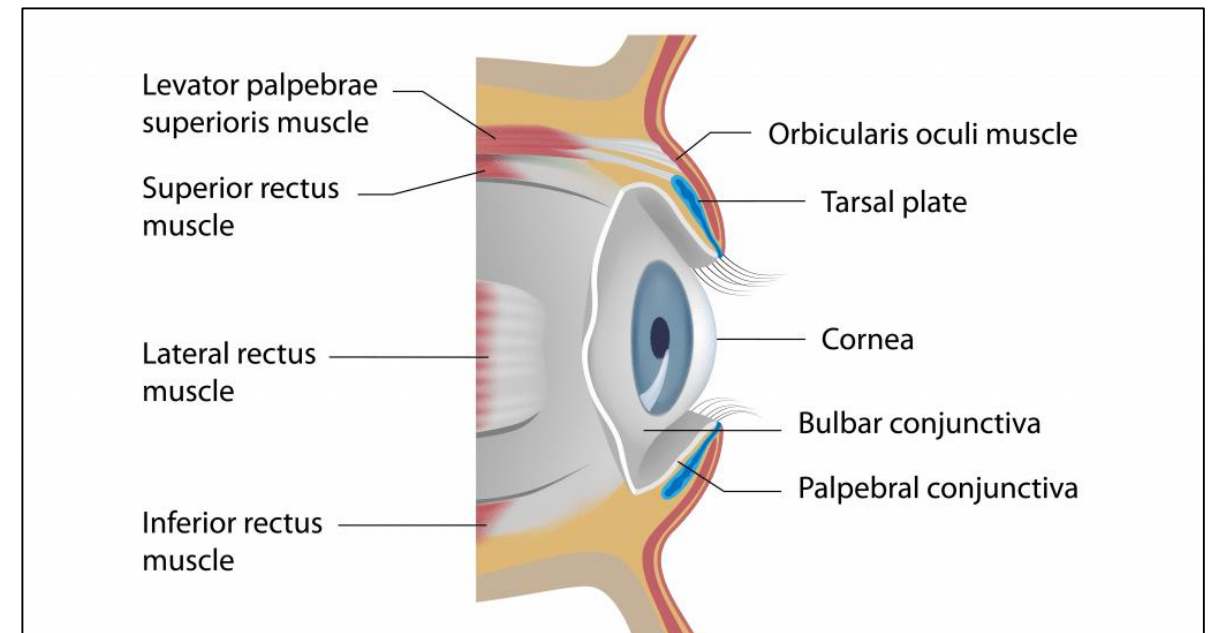
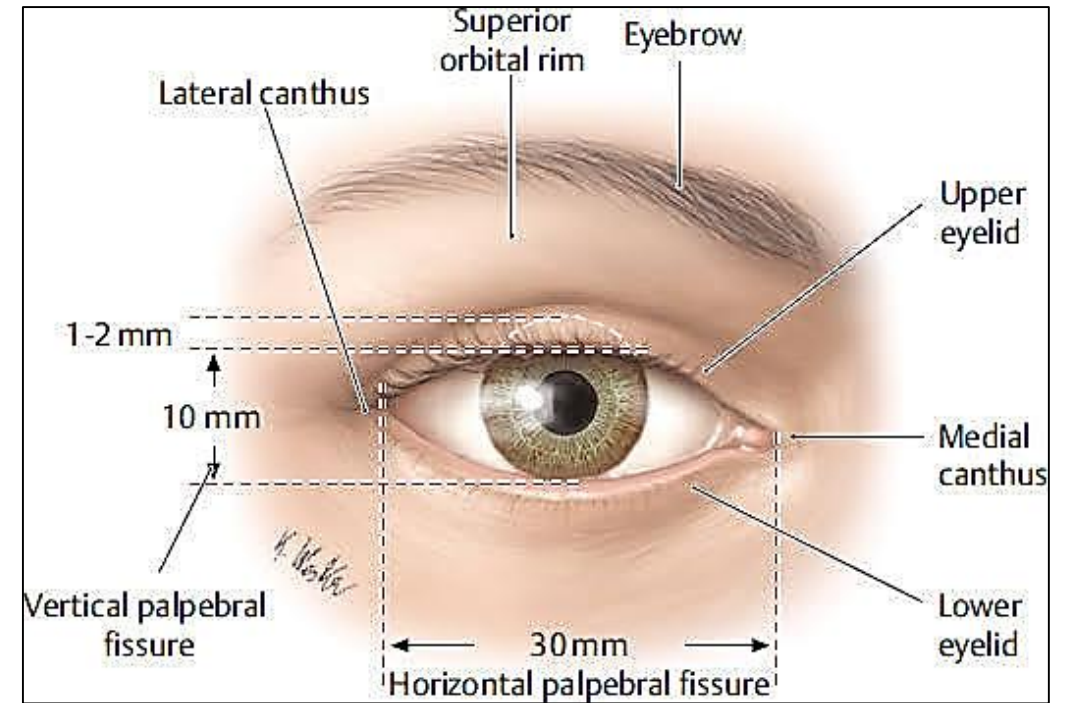
Learning Objectives

At the end, The Students will be able to:

1. Outline the anatomy of the eye lid and lacrimal apparatus
2. Understand different layers of eye
3. Recognize origin & course of optic nerve
4. Understand extraocular muscles and their nerve supply
5. Recognize the nerves and blood vessels in the orbit

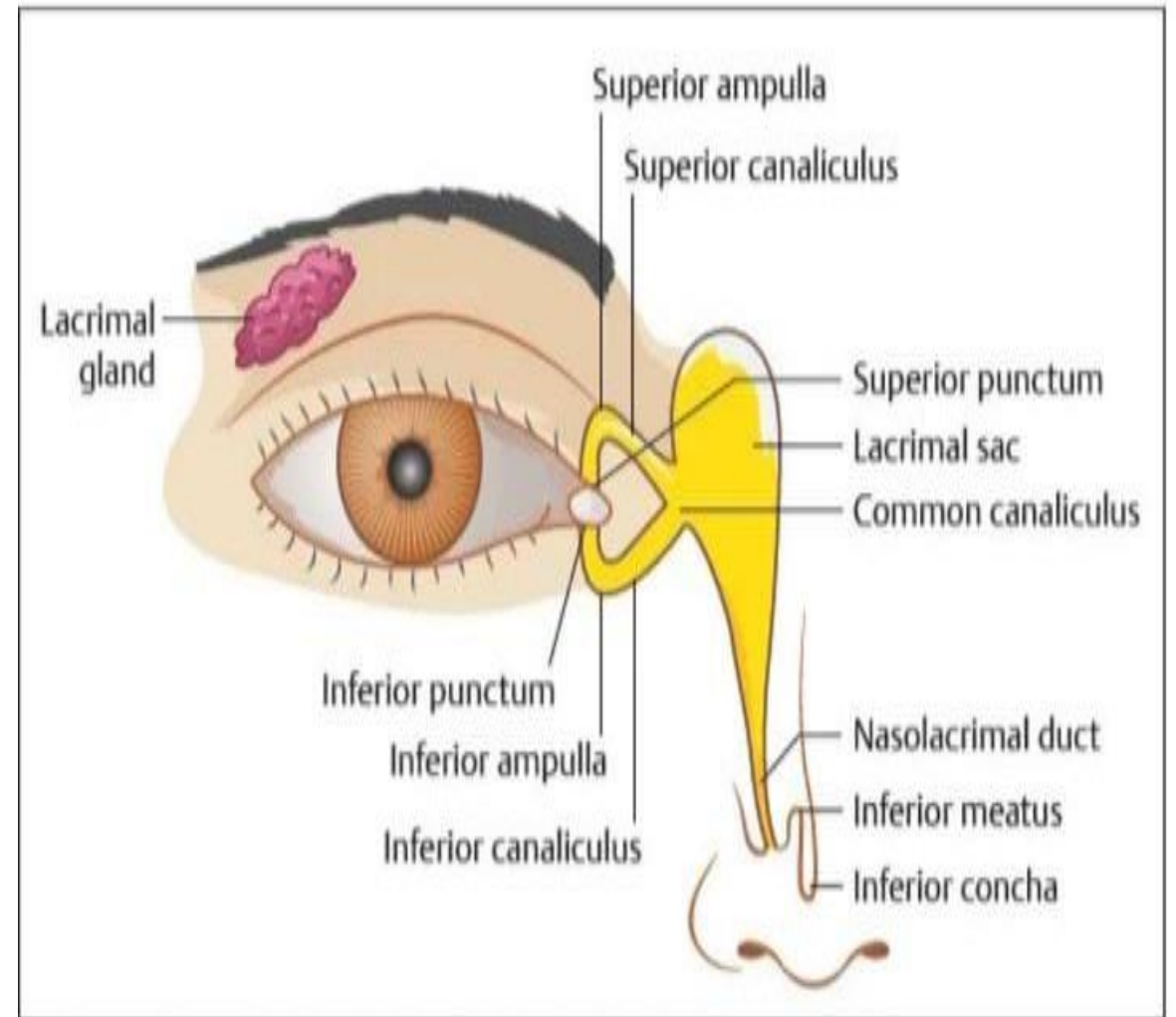
Eye Lids:

- formed of the following layers from without inward:
 - **Skin**
 - **Superficial fascia:** It contains no fat
 - **Muscle layer:** The palpebral part of orbicularis oculi runs transversely
 - **Tarsus:** is a thin, dense plate of fibrous tissue containing tarsal glands.
 - **Palpebral conjunctiva:** lines the deep surface of tarsal plates



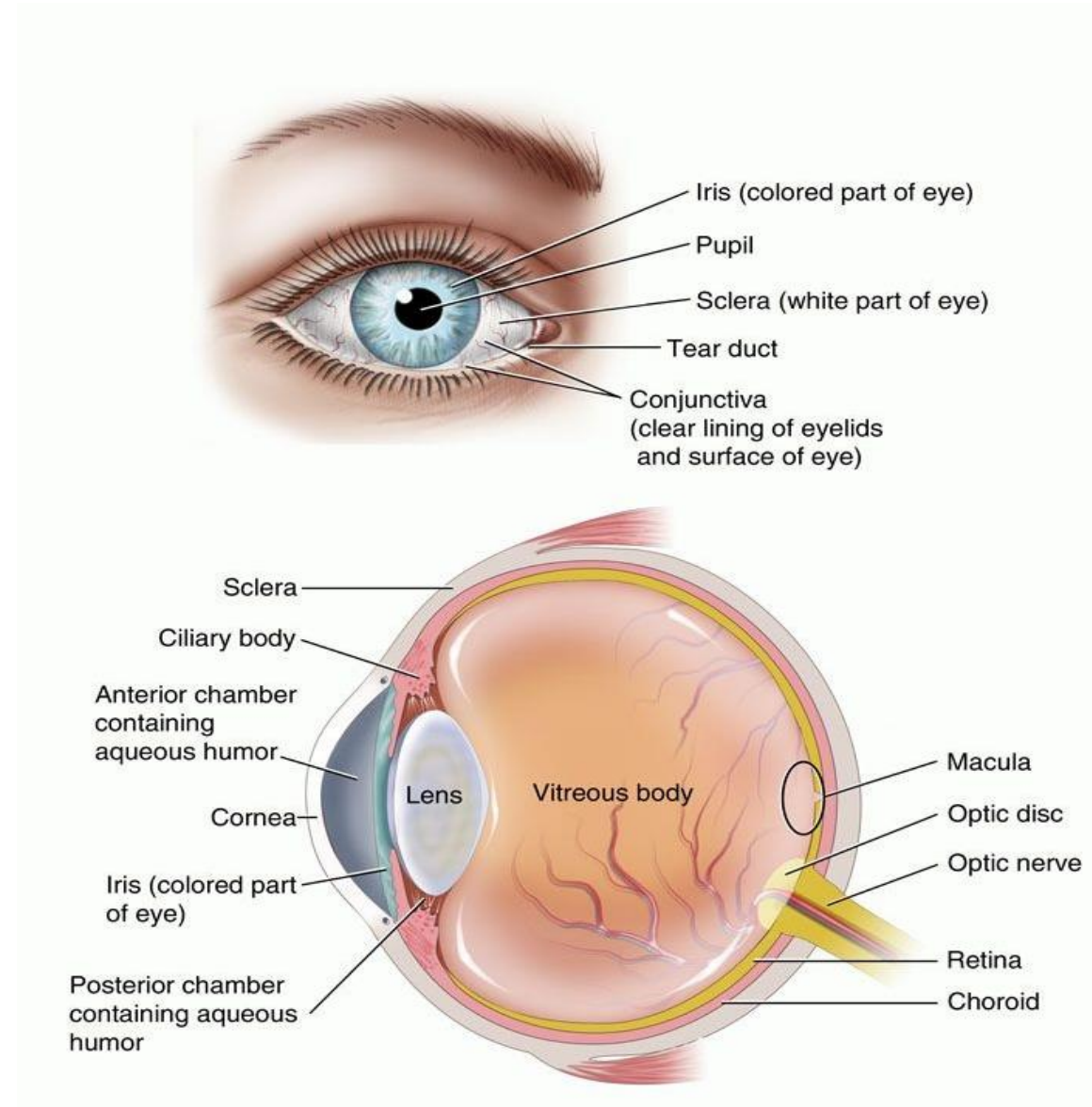
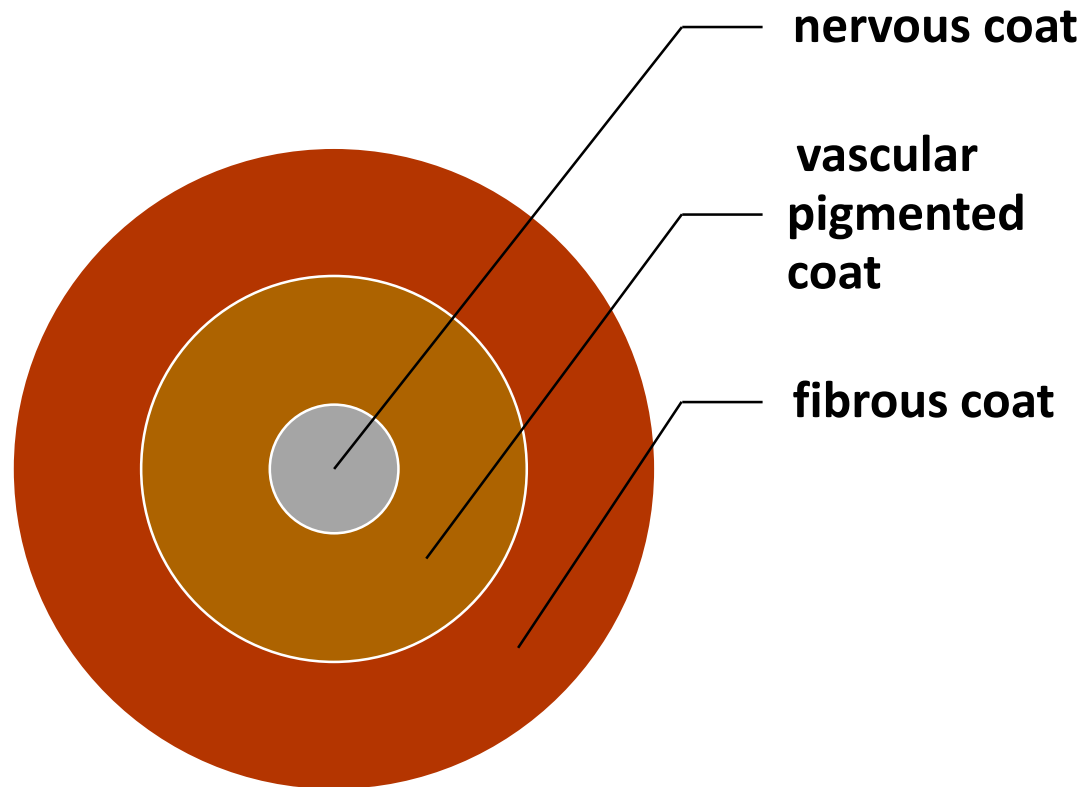
The Lacrimal Apparatus:

- consists of:
 - 1) Main and accessory Lacrimal glands and their ducts.
 - 2) Lacrimal canaliculi and puncta.
 - 3) Lacrimal sac.
 - 4) Nasolacrimal duct.



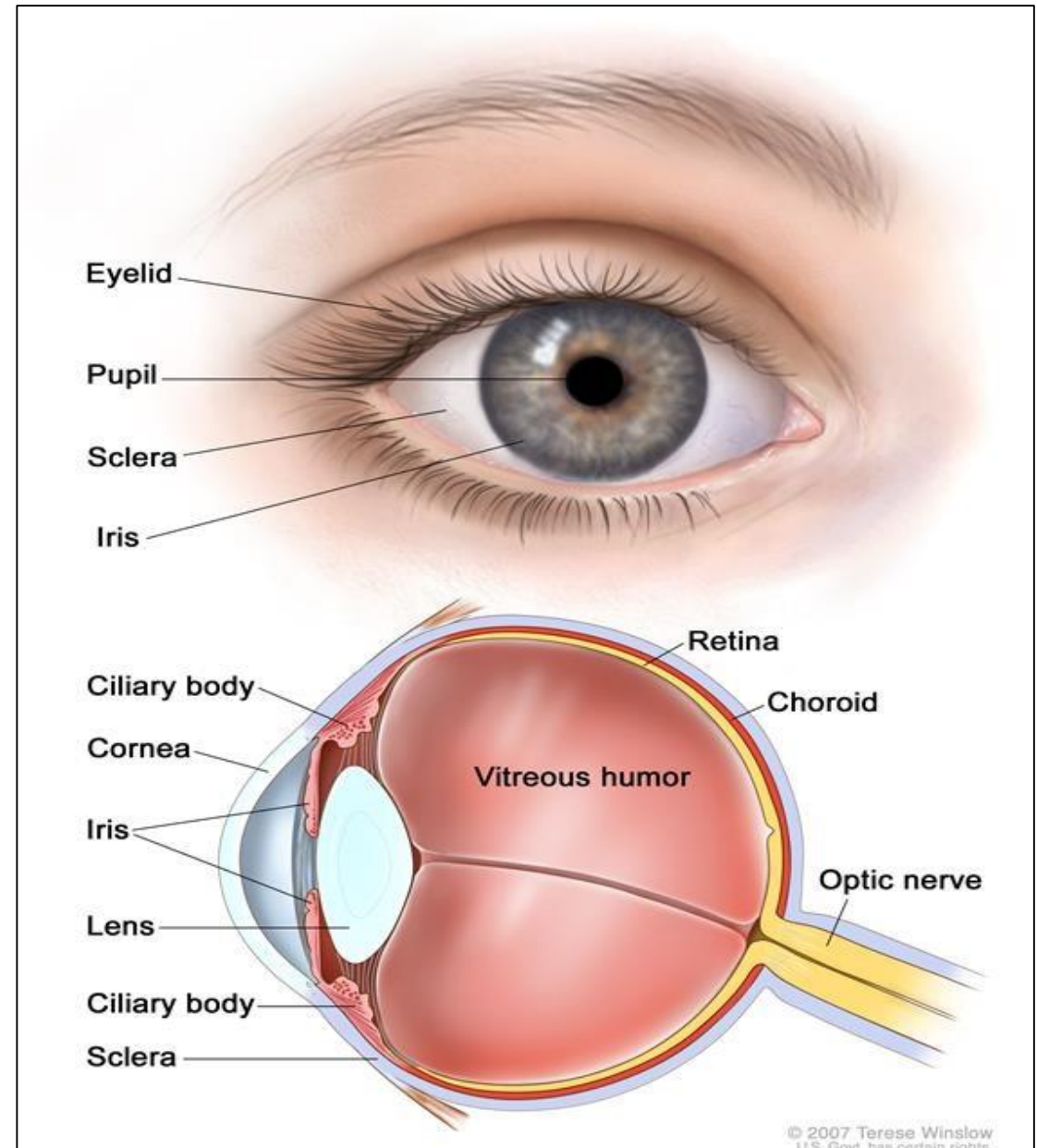
Lacrimal apparatus

Eyeball consists of three coats



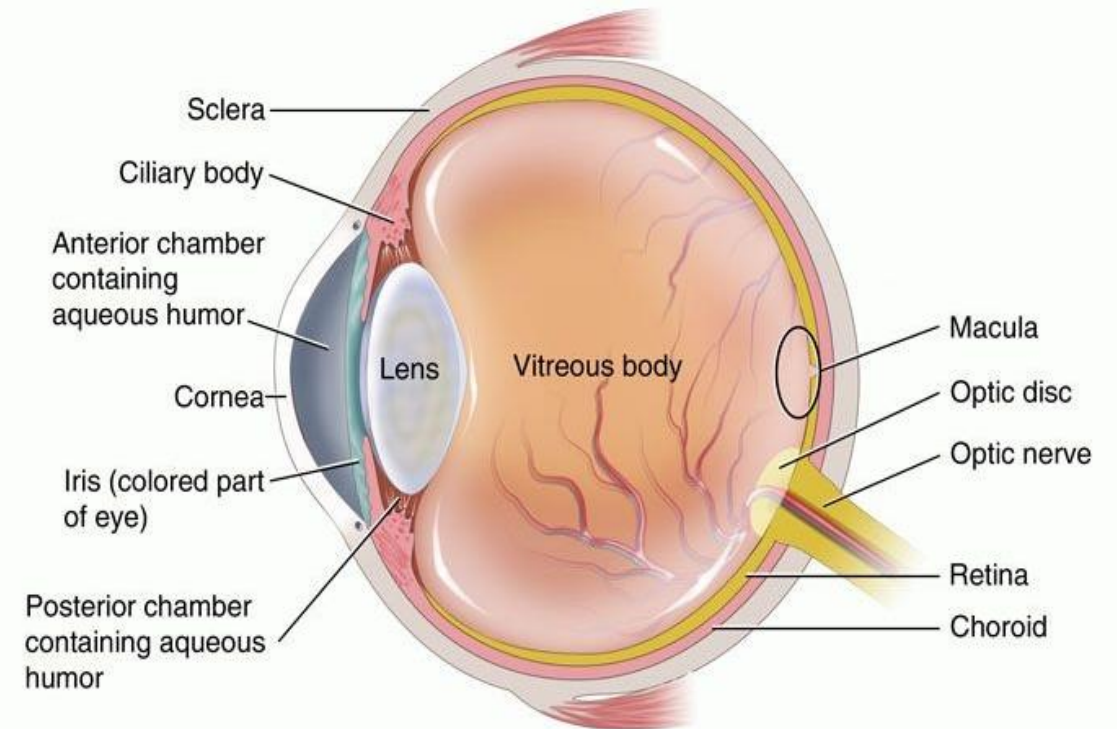
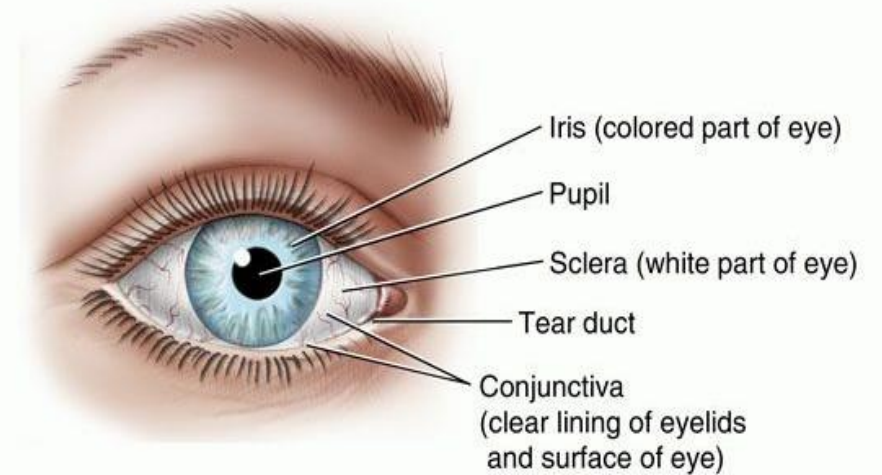
Fibrous Coat 1- The Sclera

- The opaque sclera is composed of dense fibrous tissue and
- is white. Posteriorly, it is pierced by the optic nerve sclera is directly continuous in front with the cornea at **the corneoscleral junction, or limbus.**



2- The Cornea

- The transparent **cornea** is largely responsible for the refraction of the light entering the eye . It is in contact
- posteriorly with the aqueous humor.
- **Blood Supply** The cornea is avascular and devoid of lymphatic drainage. It is nourished by diffusion from the aqueous humor and from the capillaries at its edge.
- **Nerve Supply** Long ciliary nerves from the ophthalmic division of the trigeminal nerve

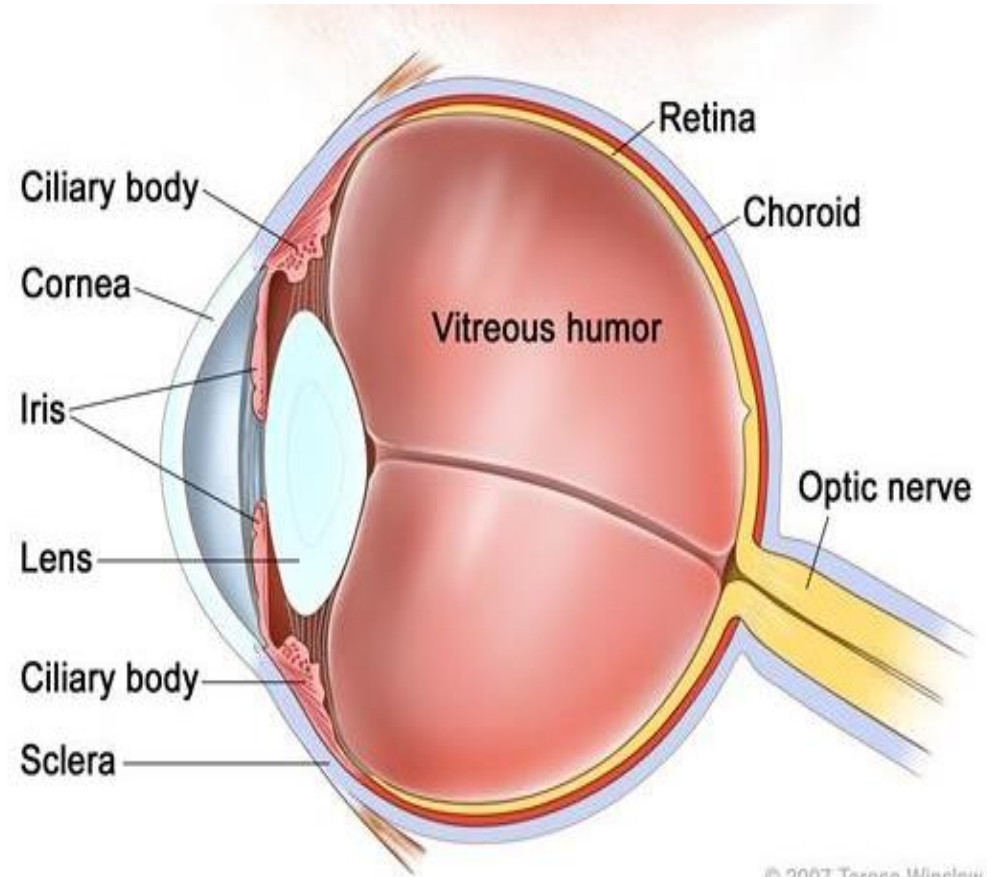


Function of the Cornea

- The cornea is the most important refractive medium of the eye.
- This refractive power occurs on the anterior surface of the cornea, where the refractive index of the cornea differs greatly from that of the air.
- The importance of the tear film in maintaining the normal environment for the corneal epithelial cells

Vascular Pigmented Coat

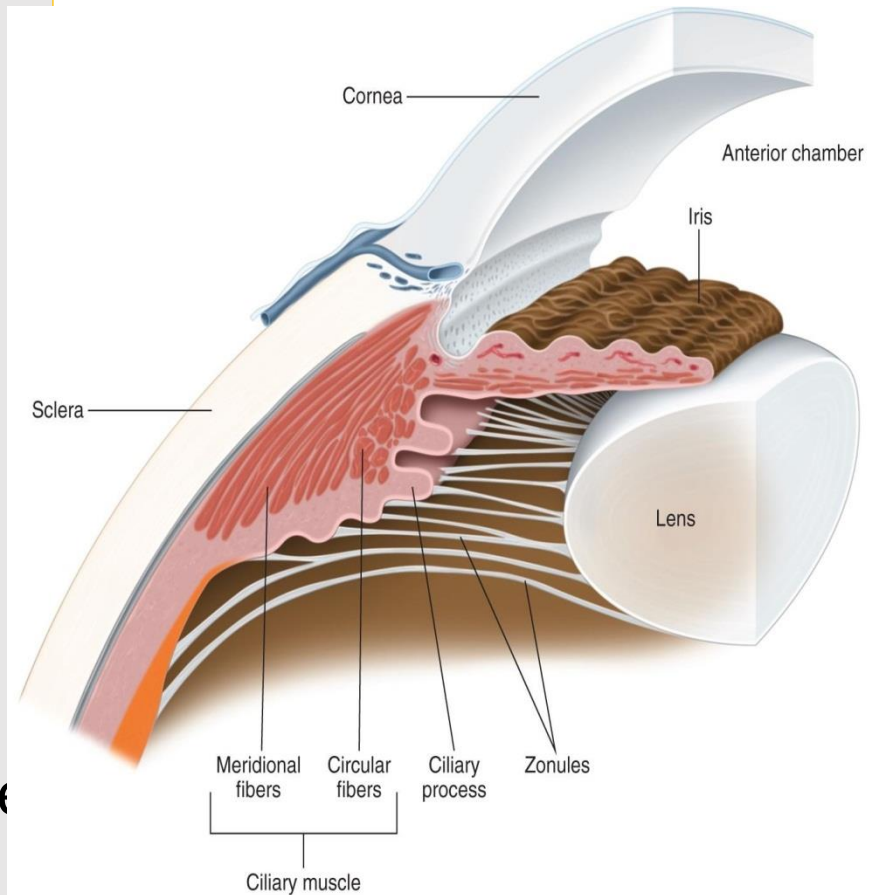
- The choroid
- The ciliary body
- The iris.
- **The Choroid**
- The choroid is composed of an outer pigmented layer and an inner, highly vascular layer.



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The Ciliary Body

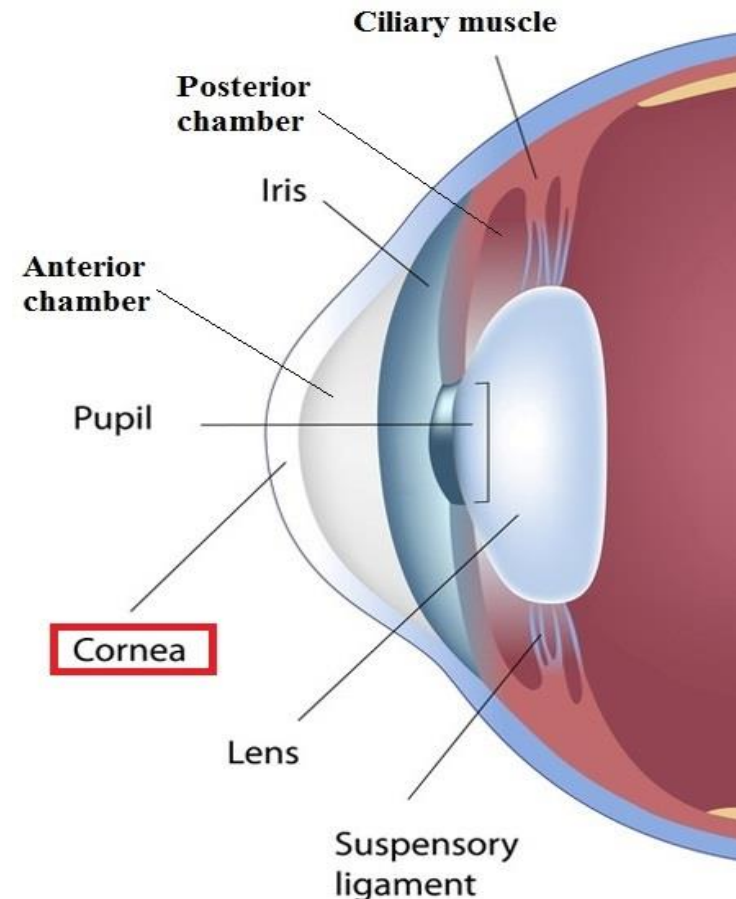
- It is composed of :
- **The ciliary ring** is the posterior part of the body
- **The ciliary processes** are radially arranged folds, or ridges, to the posterior surfaces of which are connected the suspensory ligaments of the lens.
- **The ciliary muscle** is composed of meridional and circular fibers of smooth muscle.
- The meridional fibers run backward from the region of the corneoscleral junction to the ciliary processes.
- The circular fibers are fewer in number and lie internal to the meridional fiber



lens

- Lens is attached to the ciliary processes of the ciliary body
- by the **suspensory ligament**. The pull of the radiating fibers
- of the suspensory ligament tends to keep the elastic lens flattened so that the eye can be focused on distant objects.

- **The Lens**
- The lens is a transparent, biconvex structure
- enclosed in a transparent capsule. It is situated behind the iris and in front of the vitreous body



➤ **Nerve supply:**

- The **ciliary muscle** is supplied by the parasympathetic
 - fibers from the oculomotor nerve ... the ciliary ganglion..... the postganglionic fibers pass forward to the eyeball in the short ciliary nerves.

➤ **Action:**

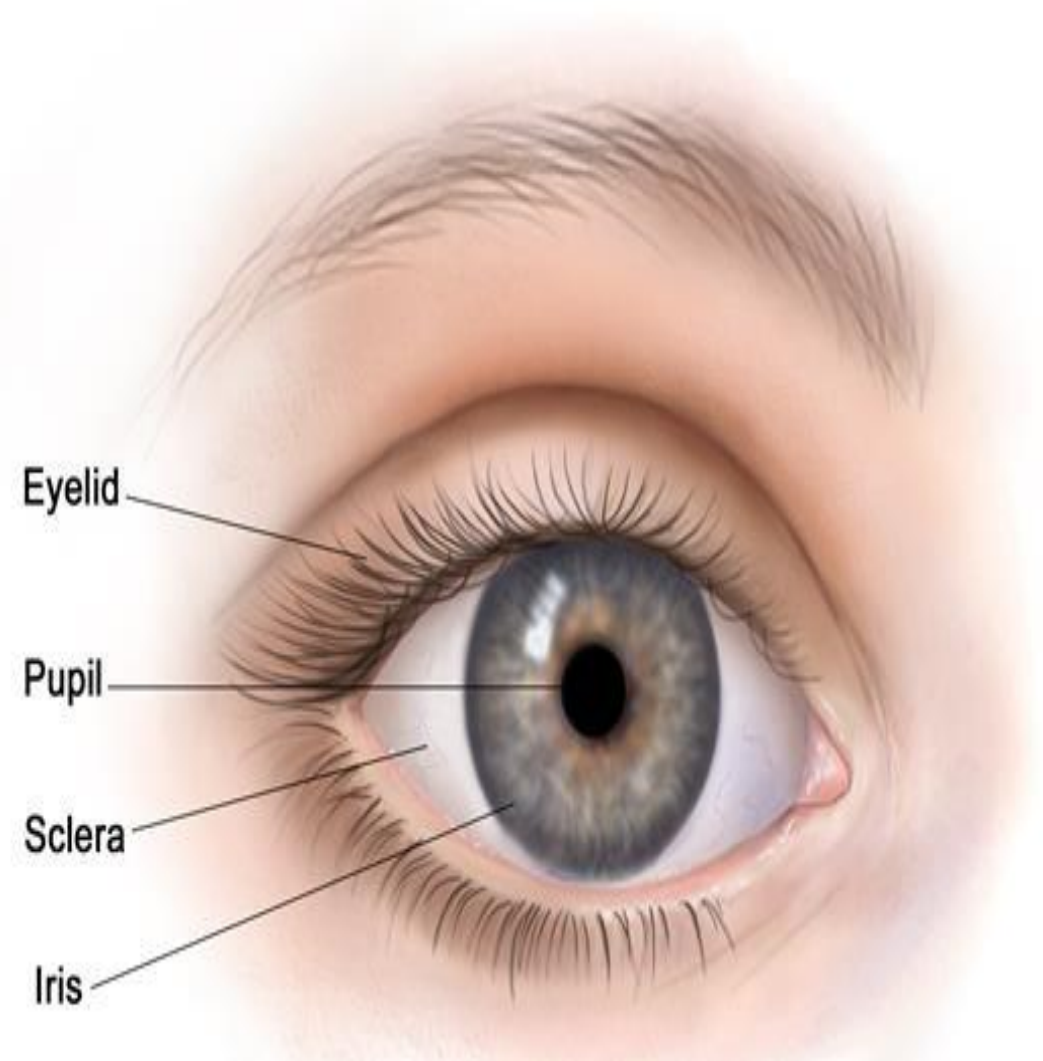
Contraction of the ciliary muscle, especially the meridional fibers, pulls the ciliary body forward. This relieves the tension in the suspensory ligament



the elastic lens becomes more convex. This increases the refractive power of the lens.

The Iris and Pupil

- The iris is a thin, contractile, pigmented diaphragm with a central aperture, the pupil .
- The muscle fibers of the iris are involuntary and consist
- of circular and radiating fibers.
- The circular fibers form the **sphincter pupillae** and are arranged around the margin of the pupil.
- The radial fibers form the **dilator pupillae** and
- consist of a thin sheet of radial fibers



The Iris and Pupil

Nerve supply:

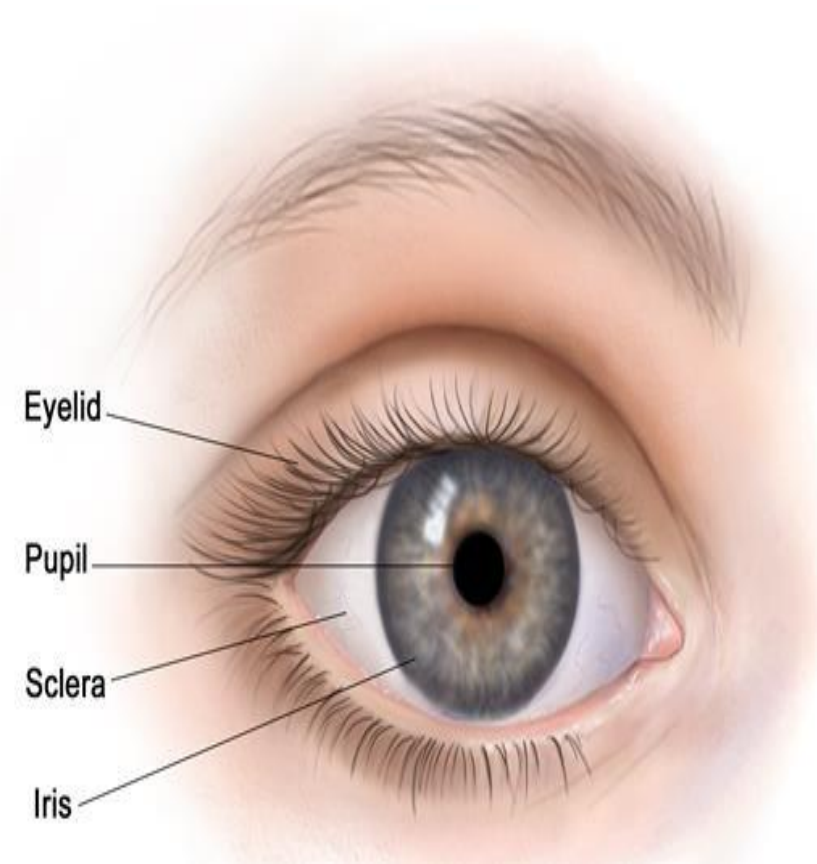
➤ The **sphincter pupillae**

is supplied by

- parasympathetic fibers from the oculomotor nerve..... ciliary ganglion.....the postganglionic fibers short ciliary nerves.

➤ **dilator pupillae**

is supplied by sympathetic fibers, which pass forward to the eyeball in the long ciliary nerves.



- **Action:**

- **The sphincter pupillae**

- constricts the pupil in

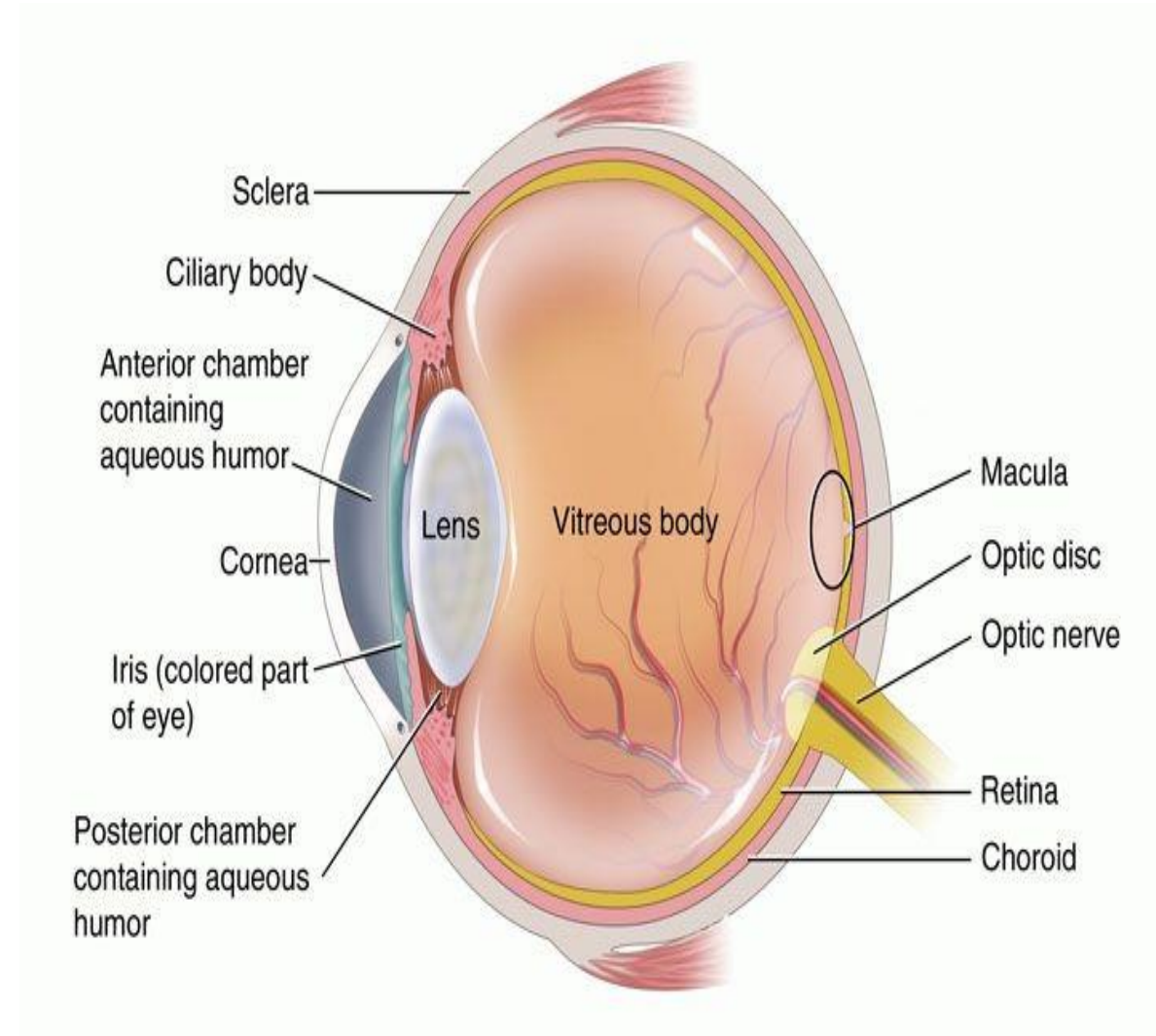
- the presence of bright light and during accommodation.

- **The dilator pupillae**

- dilates the pupil in the presence
- of light of low intensity or in the presence of excessive sympathetic activity such as occurs in fright.

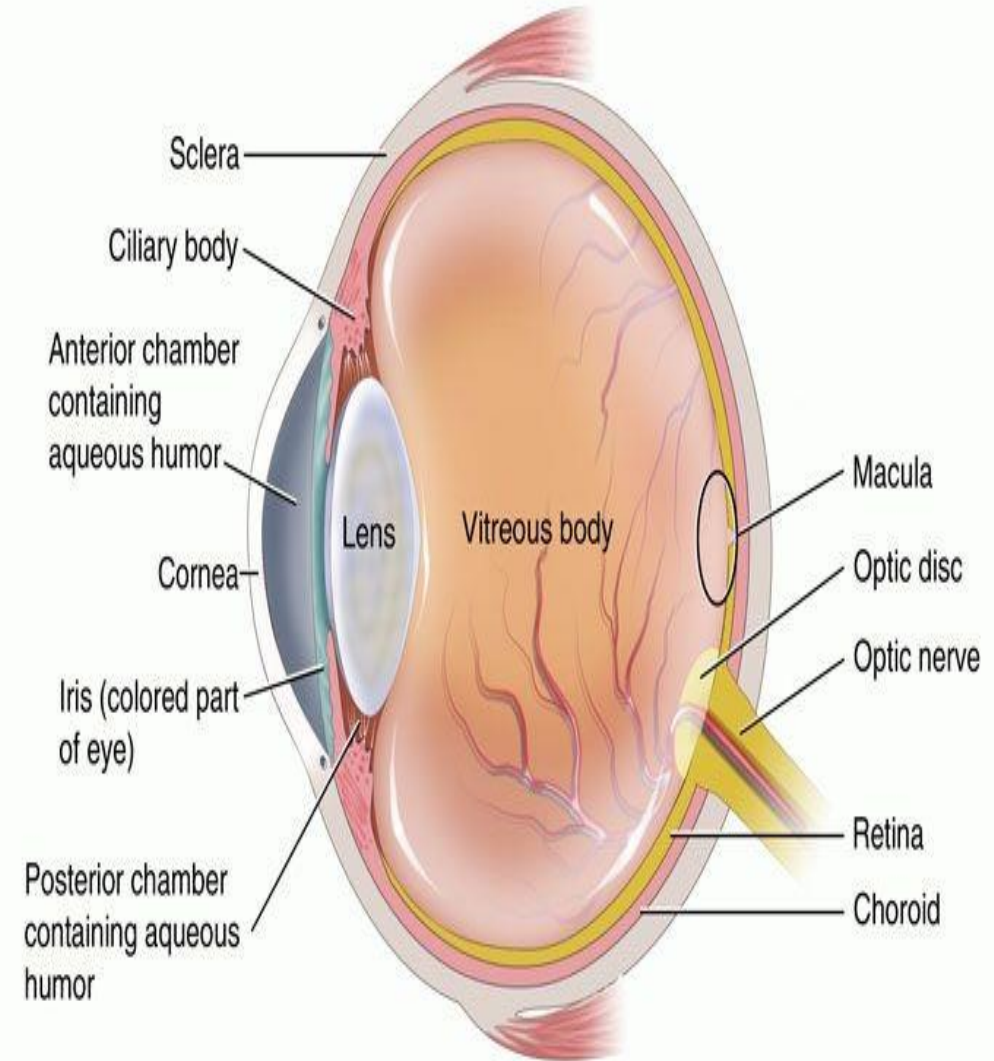
Nervous Coat: The Retina

- The retina consists of an **outer pigmented layer** and an
- **inner nervous layer**
- The posterior three quarters of the retina is the receptor organ.



Nervous Coat: The Retina

- The optic nerve leaves the retina about 3 mm to the medial side of the macula lutea by the optic disc.
- **The optic disc:**
- is slightly depressed at its center where it is pierced by
- the **central artery of the retina.**
- At the optic disc is a complete absence of **rods** and **cones** so that it is insensitive to

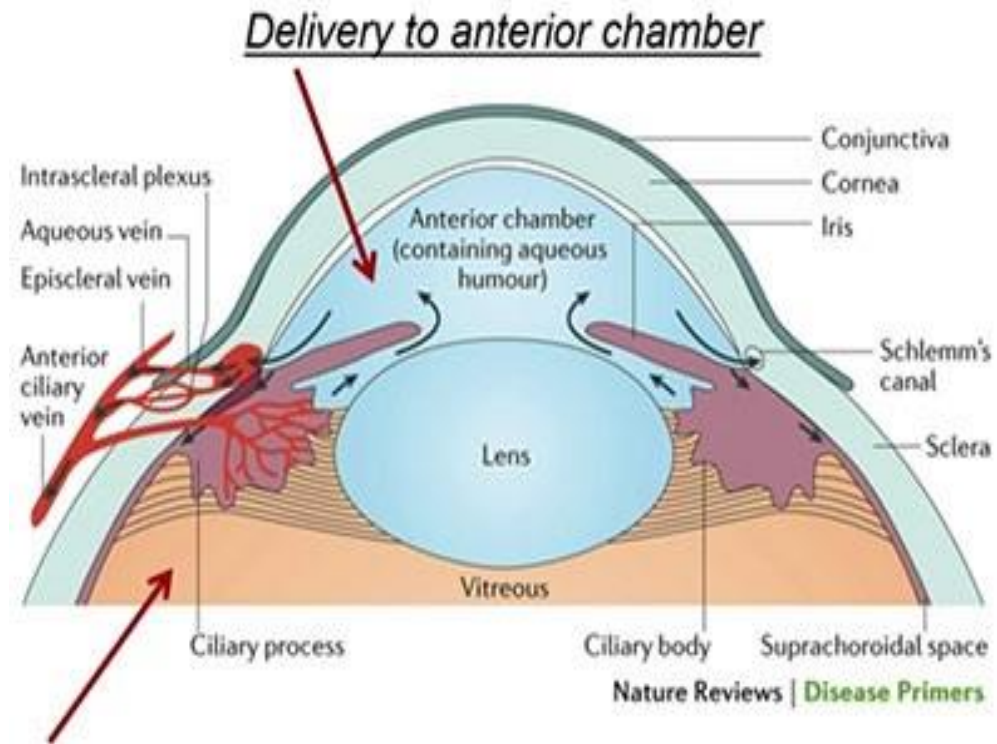


Contents of the Eyeball

The contents of the eyeball consist of the refractive media, **the aqueous humor, the vitreous body, and the lens**

- **Aqueous Humor**

- The aqueous humor is a clear fluid that fills the anterior
- and posterior chambers of the eyeball.
- **source:** from the ciliary processes
- **drainage:**
- away through the spaces at the iridocorneal angle into the **canal of Schlemm**
- **Obstruction Glaucoma**

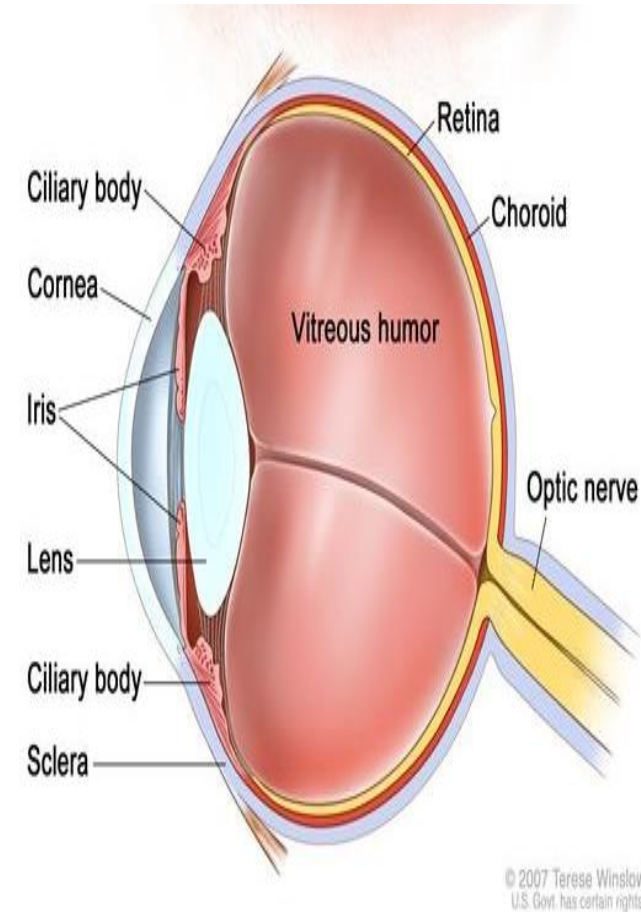


The function of the aqueous humor:

- is to support the wall of the eyeball maintaining its optical shape.
- It also nourishes the cornea and the lens
- removes the products of metabolism
- these functions are important because the cornea and the lens do not possess a blood supply.

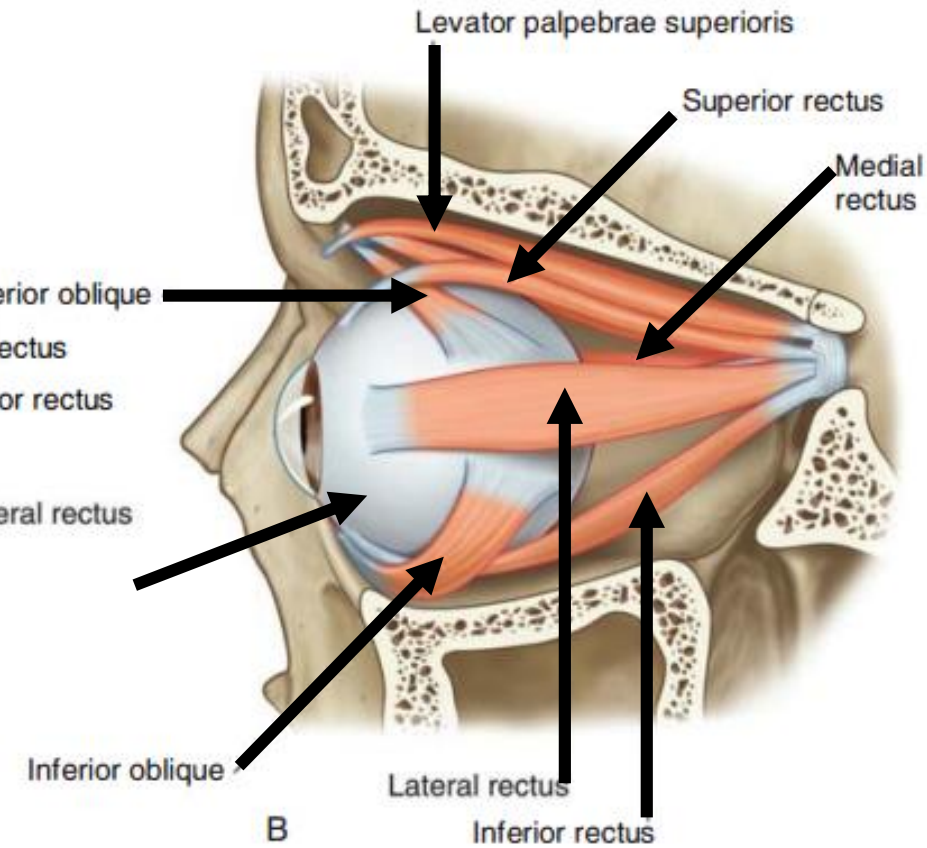
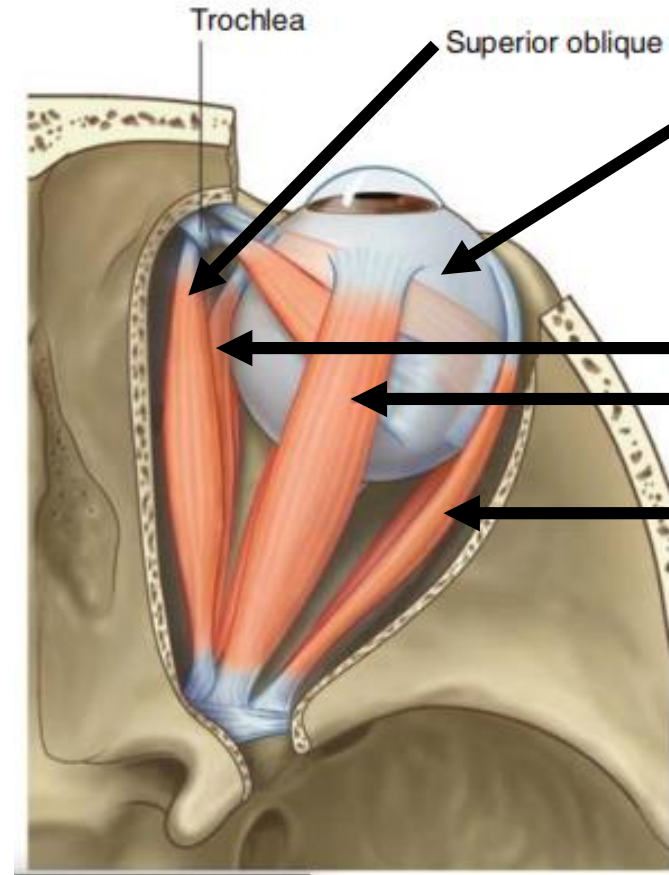
- **Vitreous Body**

- The vitreous body fills the eyeball behind the lens and is a transparent gel.
- The **hyaloid canal** is a narrow channel that runs through the vitreous body from the optic disc to the posterior surface of the lens
- in the fetus, it is filled by the hyaloid artery, which disappears before birth.
- **The function of the vitreous body:**
 - ❖ is to contribute slightly to the magnifying power of the eye.
 - ❖ It supports the posterior surface of the lens
 - ❖ assists in holding the neural part of the retina against the pigmented part of the retina.

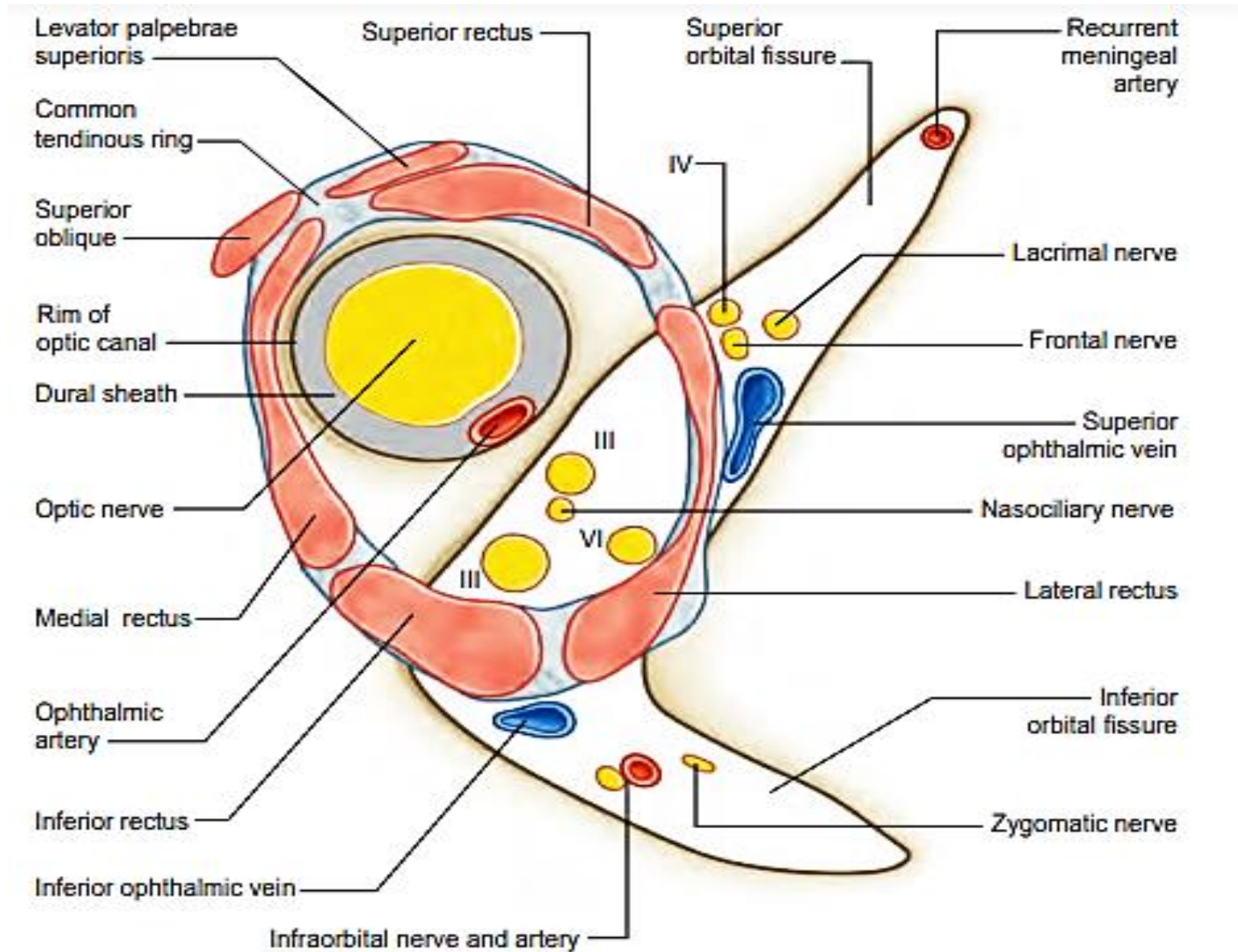


Extraocular muscles:

1. 4 recti (medial, lateral, superior, inferior)
2. 2 oblique (superior & inferior)
3. Levator palpebrae superioris



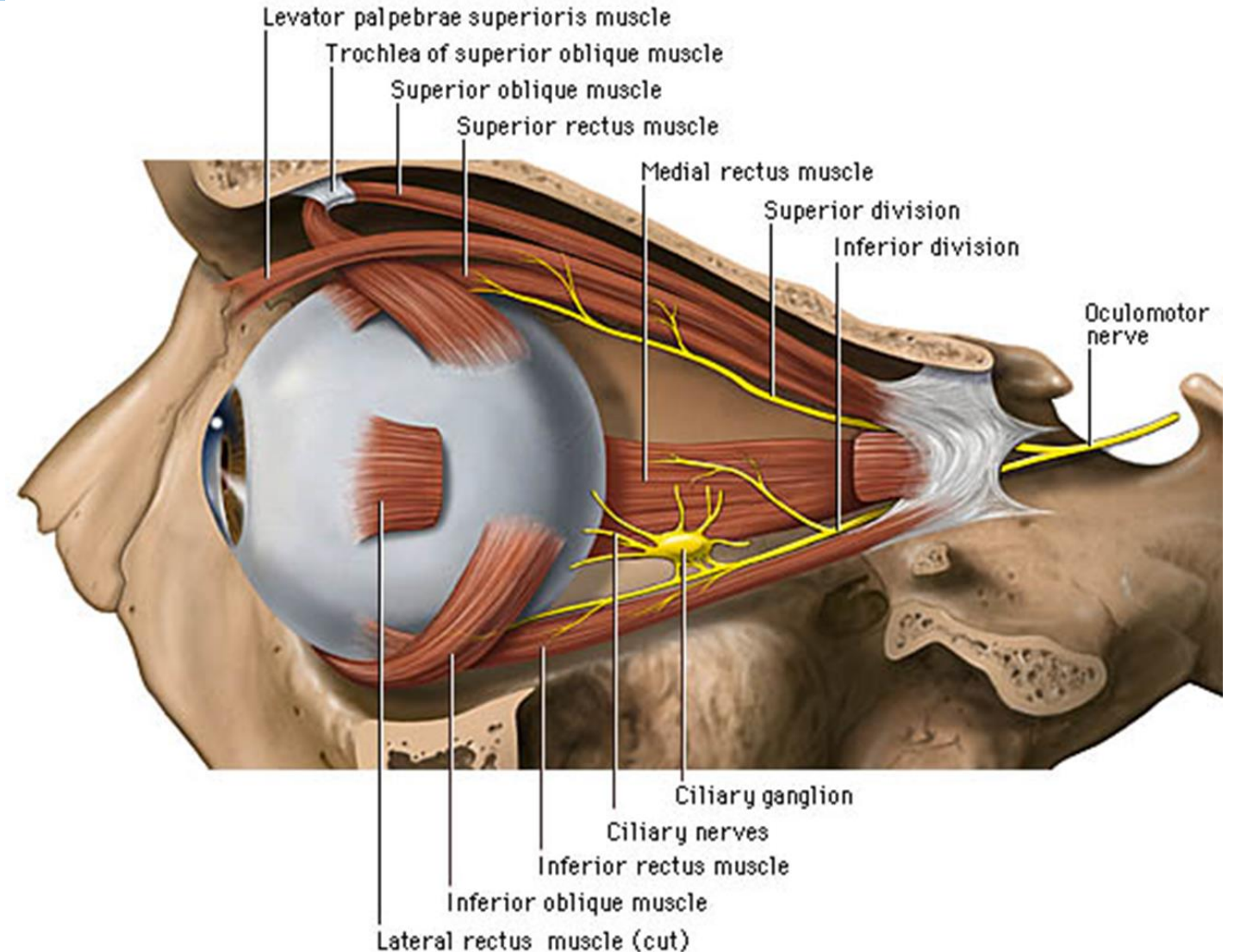
Extraocular muscles



Extraocular muscles:

All extraocular muscles are supplied by oculomotor nerve (III) except:

- ❑ Superior oblique muscle is supplied by trochlear nerve (IV).
- ❑ Lateral rectus muscle is supplied by abducent nerve (VI).



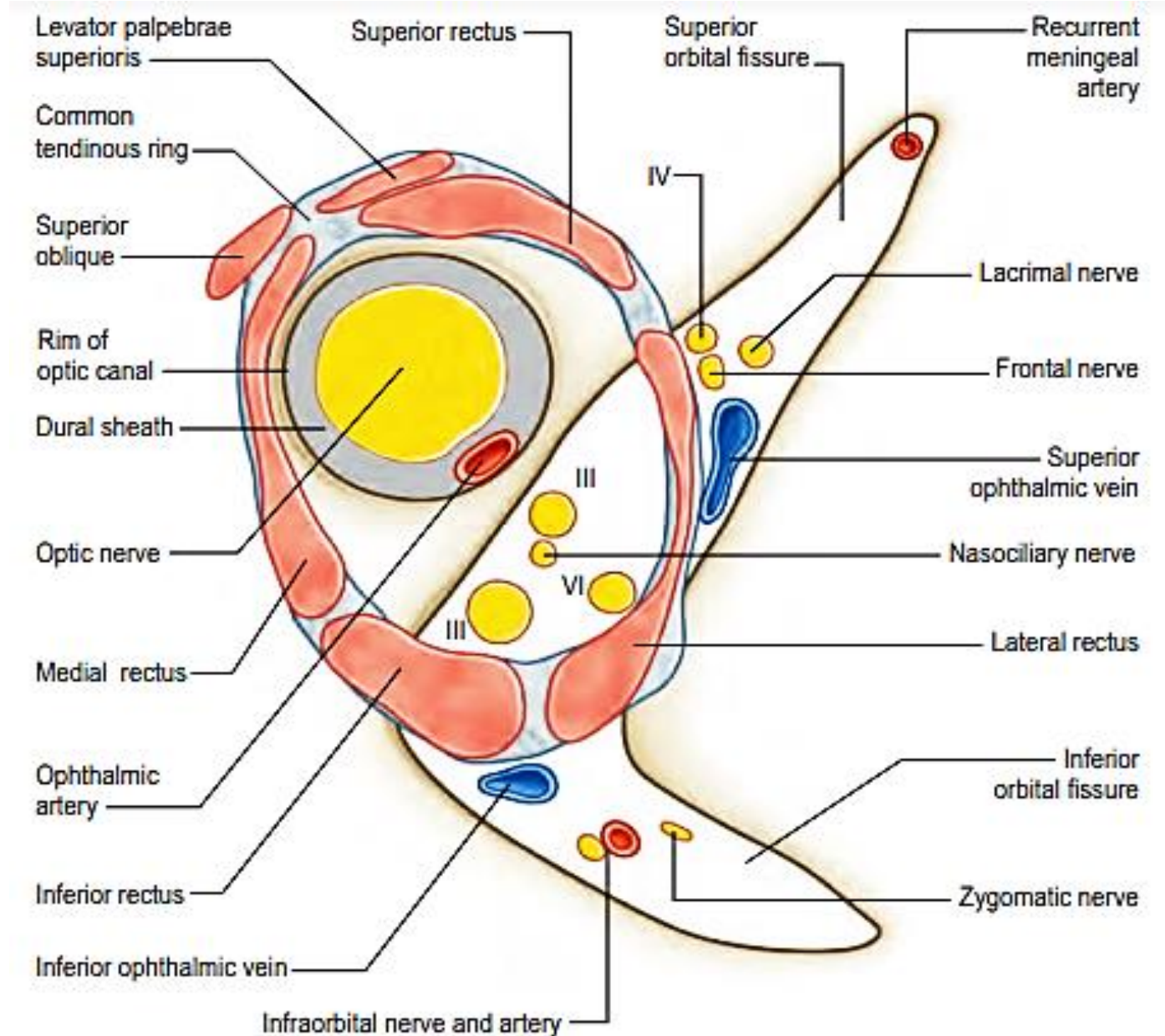
Nerves in the orbit:

1. Sensory nerves:

- Optic nerve
- Zygomatic nerve ✓
- 3 branches of ophthalmic nerve:
 - ❖ Lacrimal nerve ✓
 - ❖ Frontal nerve ✓
 - ❖ Nasociliary nerve ✓

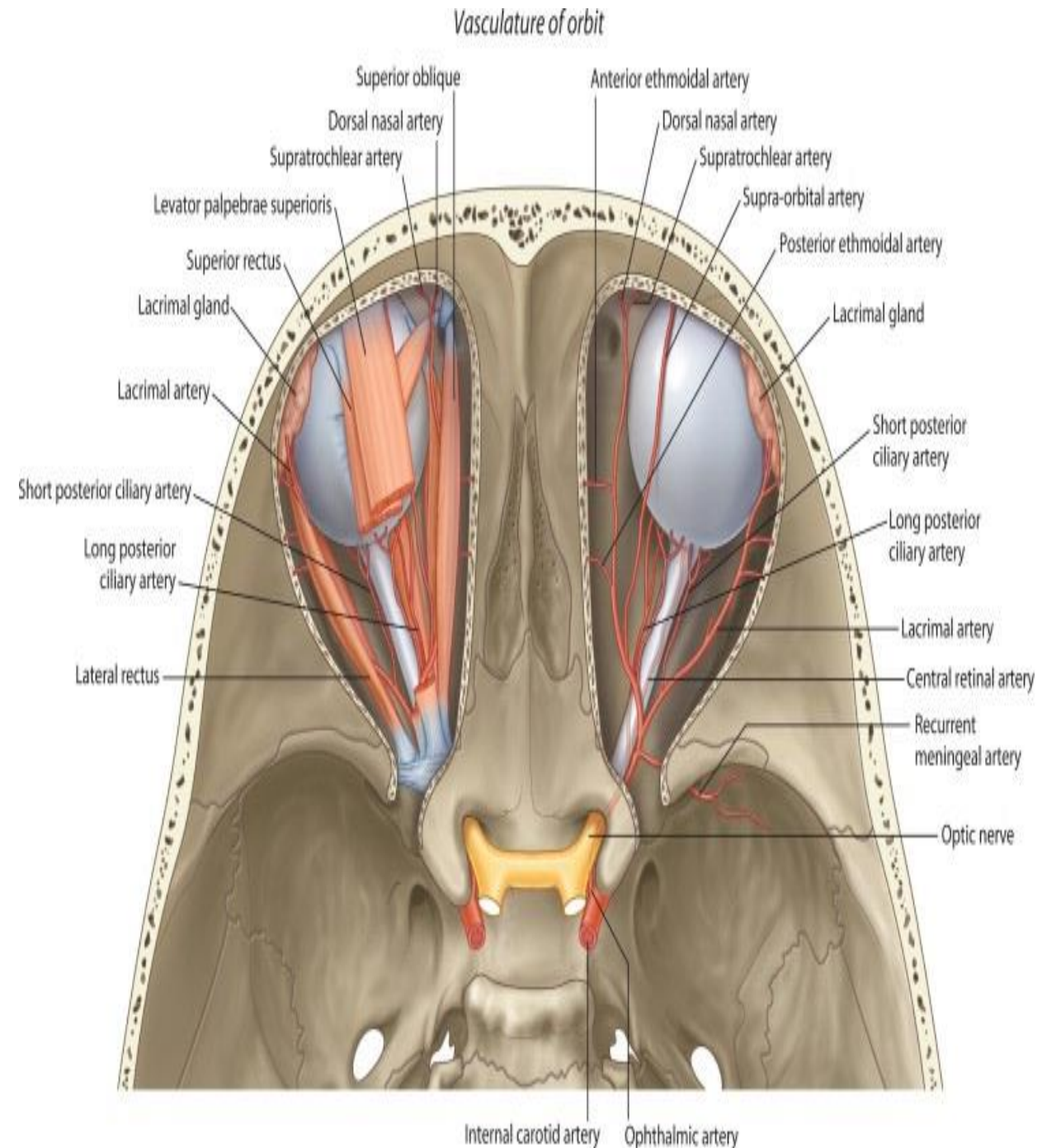
2. Motor nerves:

- Oculomotor nerve (superior and inferior divisions) III ✓
- Trochlear nerve IV ✓
- Abducent nerve VI



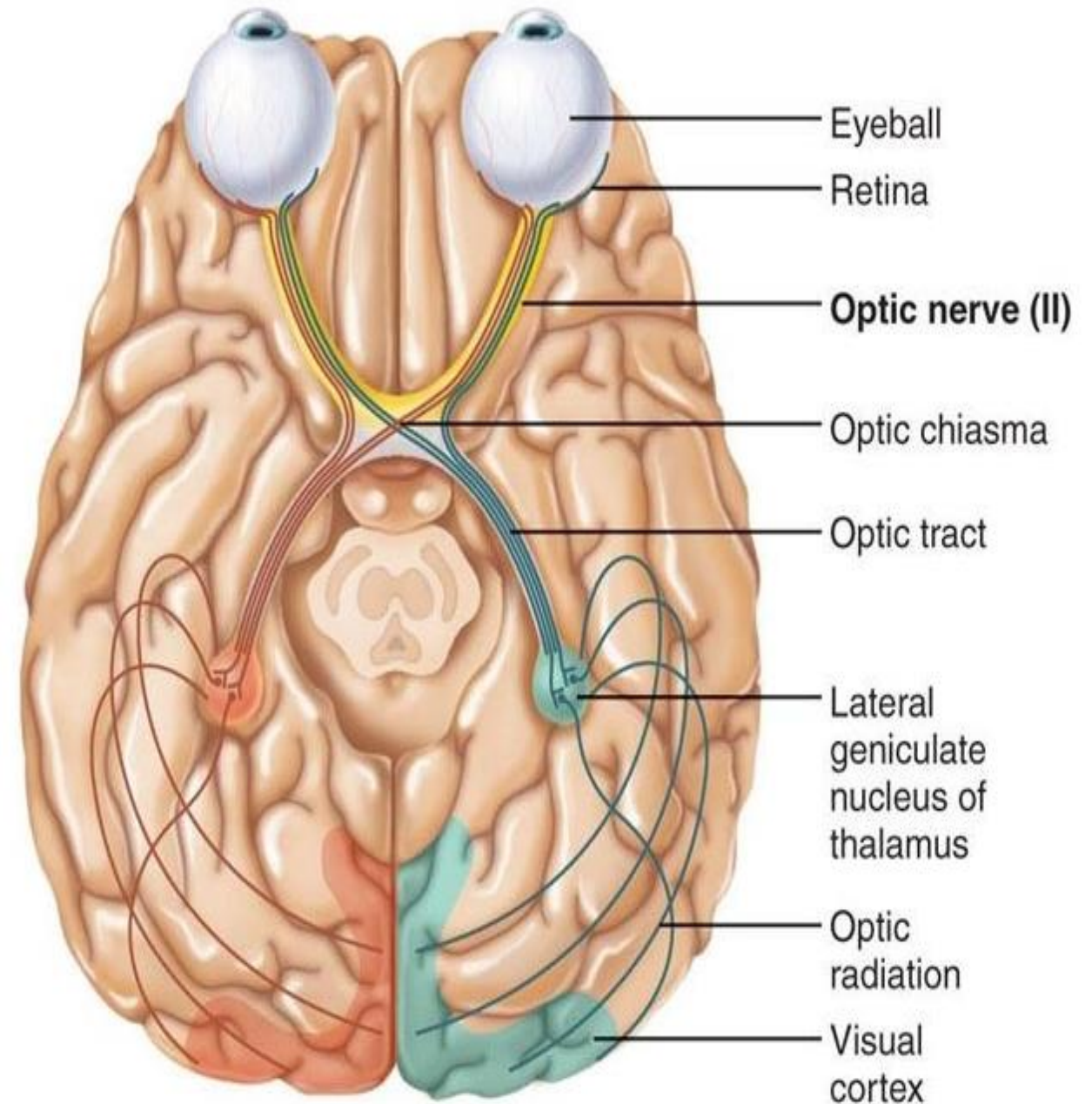
Optic Nerve

- It is about 4cm long,
- The optic nerve enters the orbit from the middle cranial fossa by passing through the optic canal .
- It is accompanied by the ophthalmic artery, which lies on its lower lateral side.
- The nerve is surrounded by sheaths of pia mater, arachnoid mater, and dura mater .
- It runs forward and laterally within the cone of the recti muscles
- and pierces the sclera at a point medial to the posterior pole of the eyeball.



➤ The optic nerve is composed of the axons of the cells of the **ganglionic layer** of the retina.

- The optic nerve emerges from the back of the eyeball and leaves the orbital cavity through the optic canal to enter the cranial cavity .
- The optic nerve then unites with the optic nerve of the opposite side to form the optic chiasma



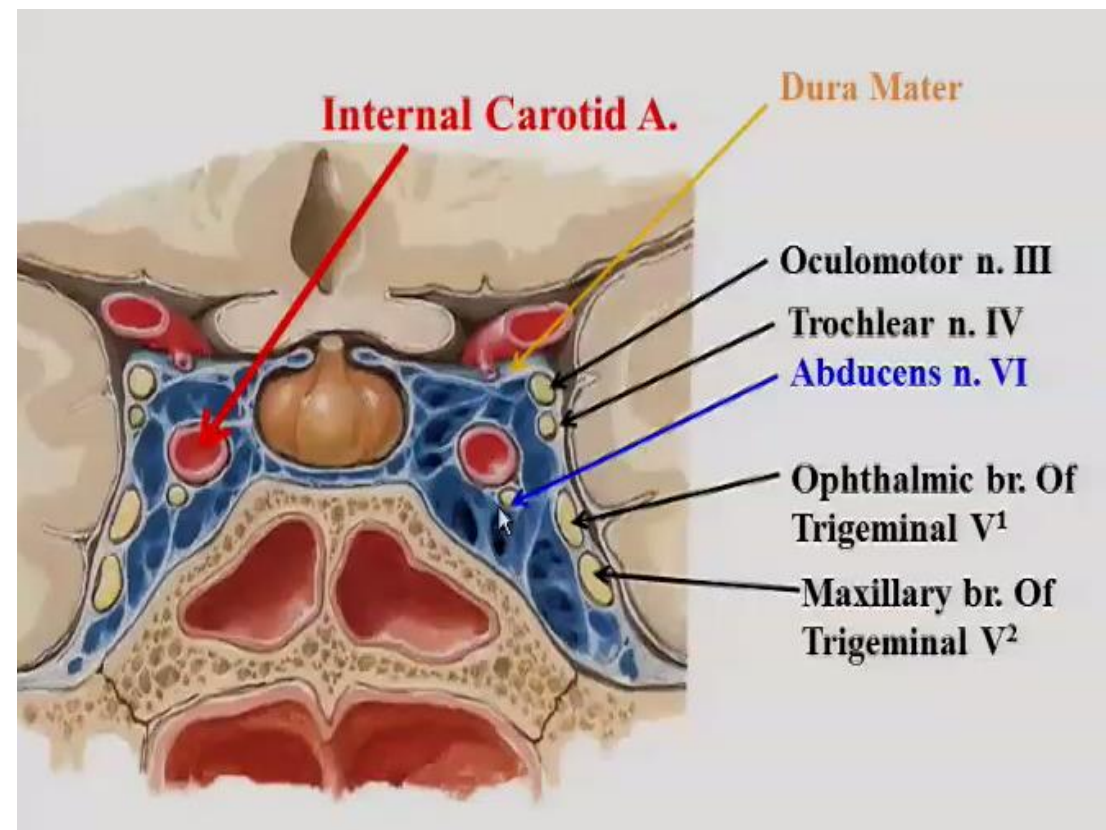
Abducent Nerve

1-middle cranial fossa

2- pass through the cavity of the cavernous sinus

3-And enters the orbit through the superior orbital fissure **inside the common tendinous ring.**

4- It passes between the two heads of the lateral rectus and supplies it only through its deep surface.



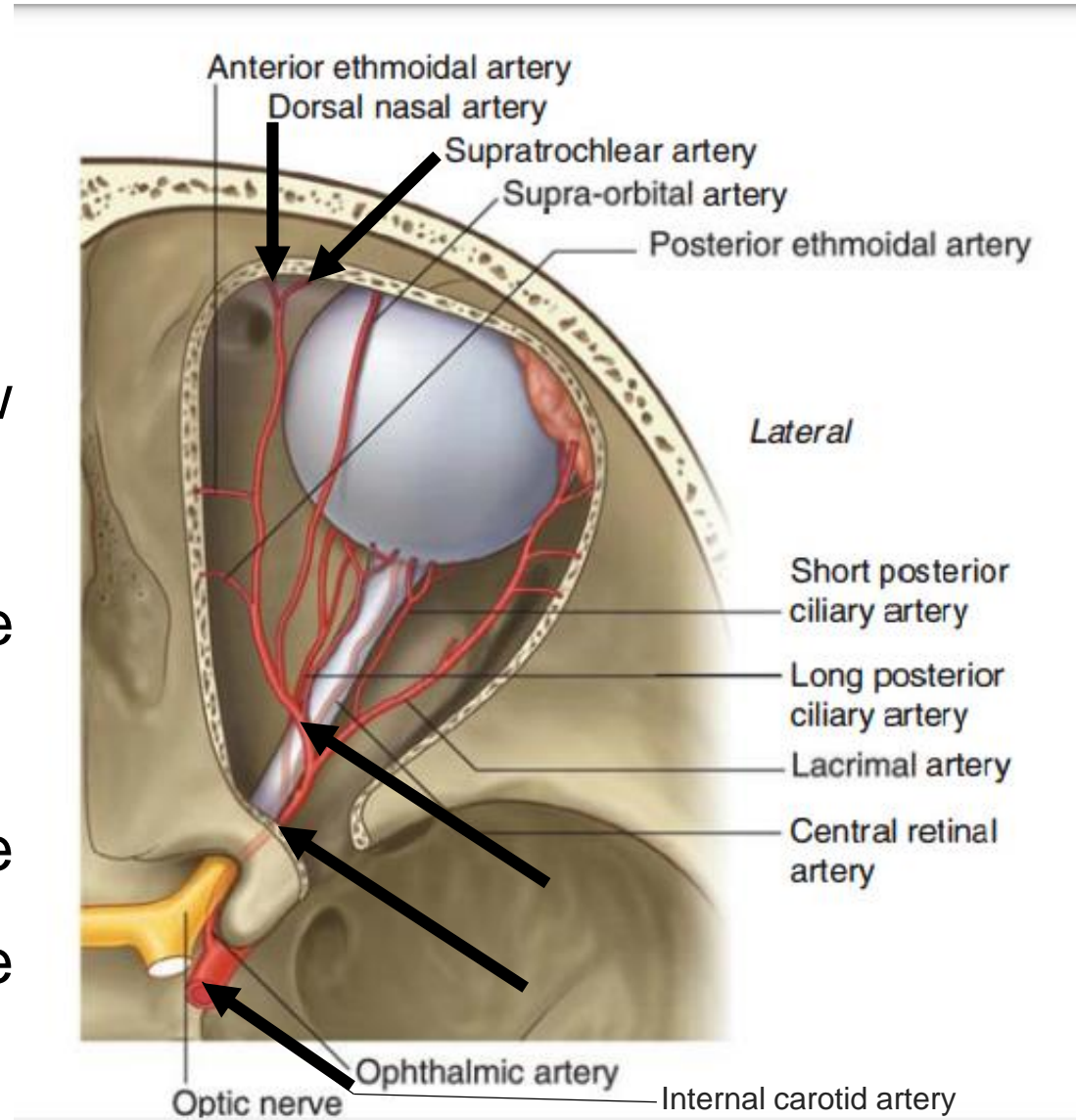
Blood vessels in the orbit

Ophthalmic artery:

Origin: from internal carotid artery.

Course:

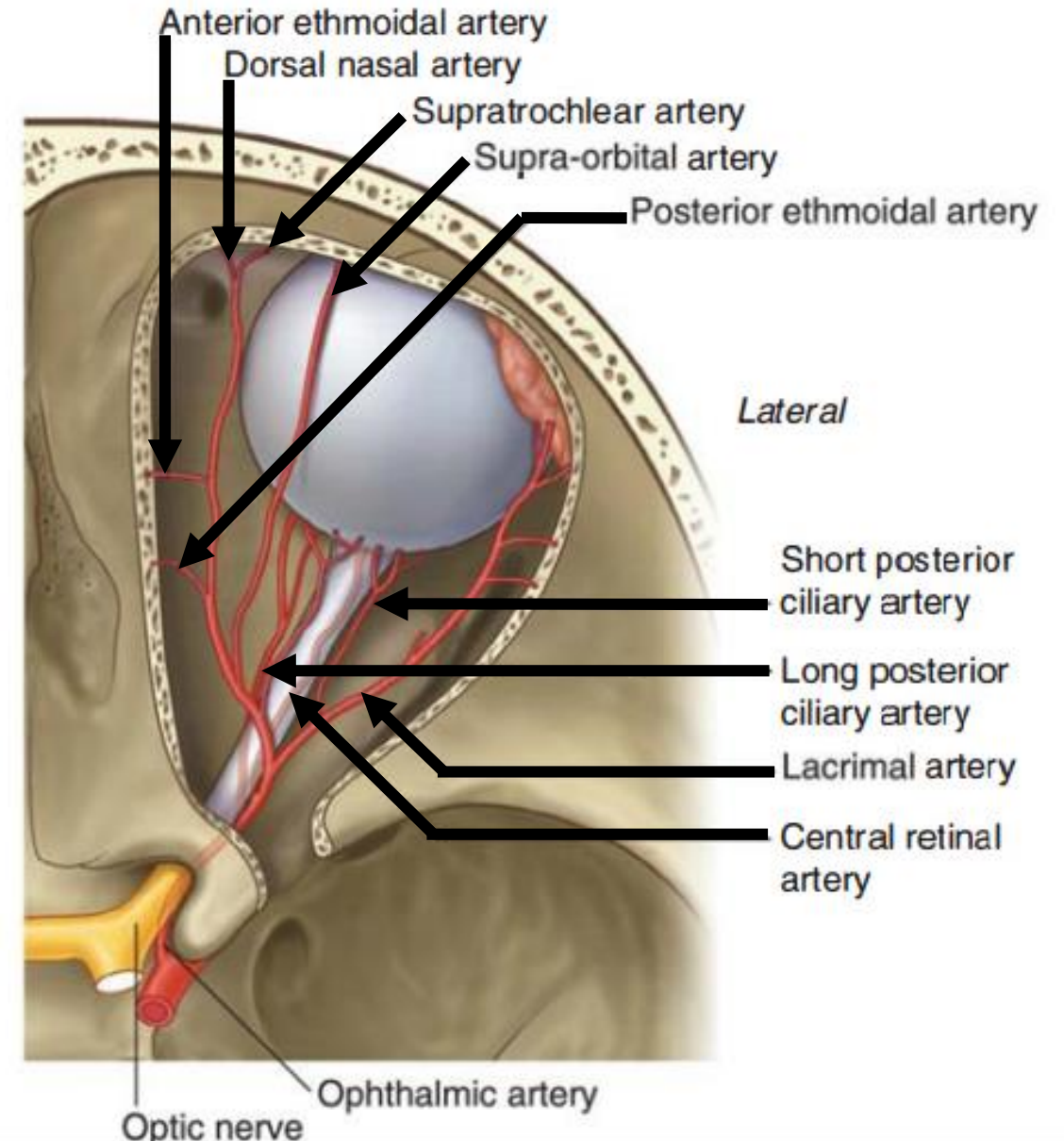
- It passes through the optic canal below and lateral to the optic nerve
- It crosses above the optic nerve obliquely from its lateral to medial side.
- It terminates at the medial end of the upper eyelid by dividing into the supratrochlear and dorsal nasal arteries.



Ophthalmic artery:

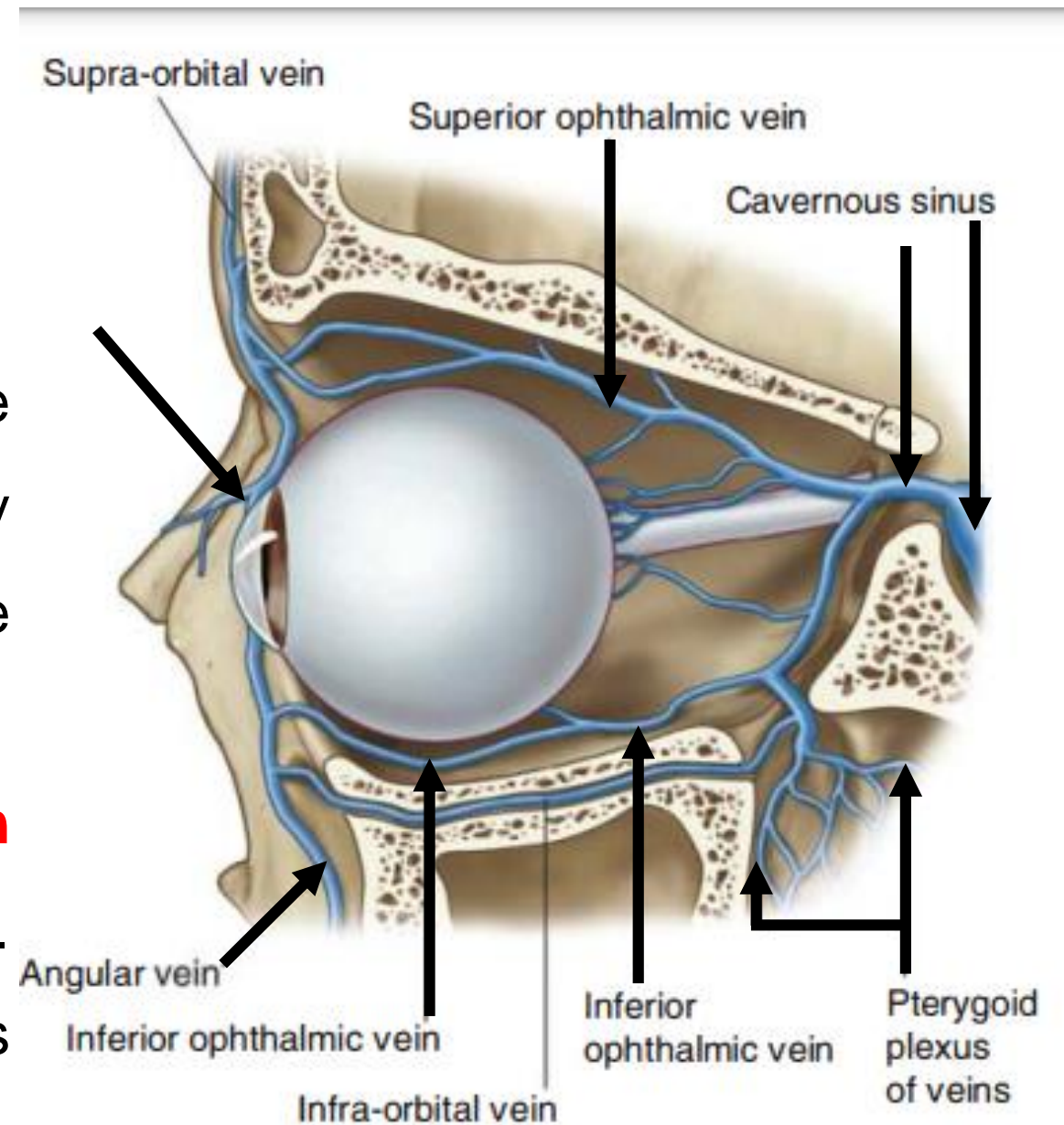
Branches:

1. Central artery of retina
2. Lacrimal artery
3. Supraorbital artery
4. Ciliary arteries (long & short posterior)
5. Posterior ethmoidal artery
6. Anterior ethmoidal artery
7. Supratrochlear artery
8. Dorsal nasal artery



Ophthalmic veins:

- They are **2** ; the superior and inferior.
- They pass backwards through the superior orbital fissure and frequently unite forming one stem which end in the cavernous sinus
- **Superior Ophthalmic Vein** communicates with the anterior facial vein.
- **Inferior Ophthalmic Vein** communicates with the pterygoid plexus of veins through the inferior orbital fissure.



Thank
you

