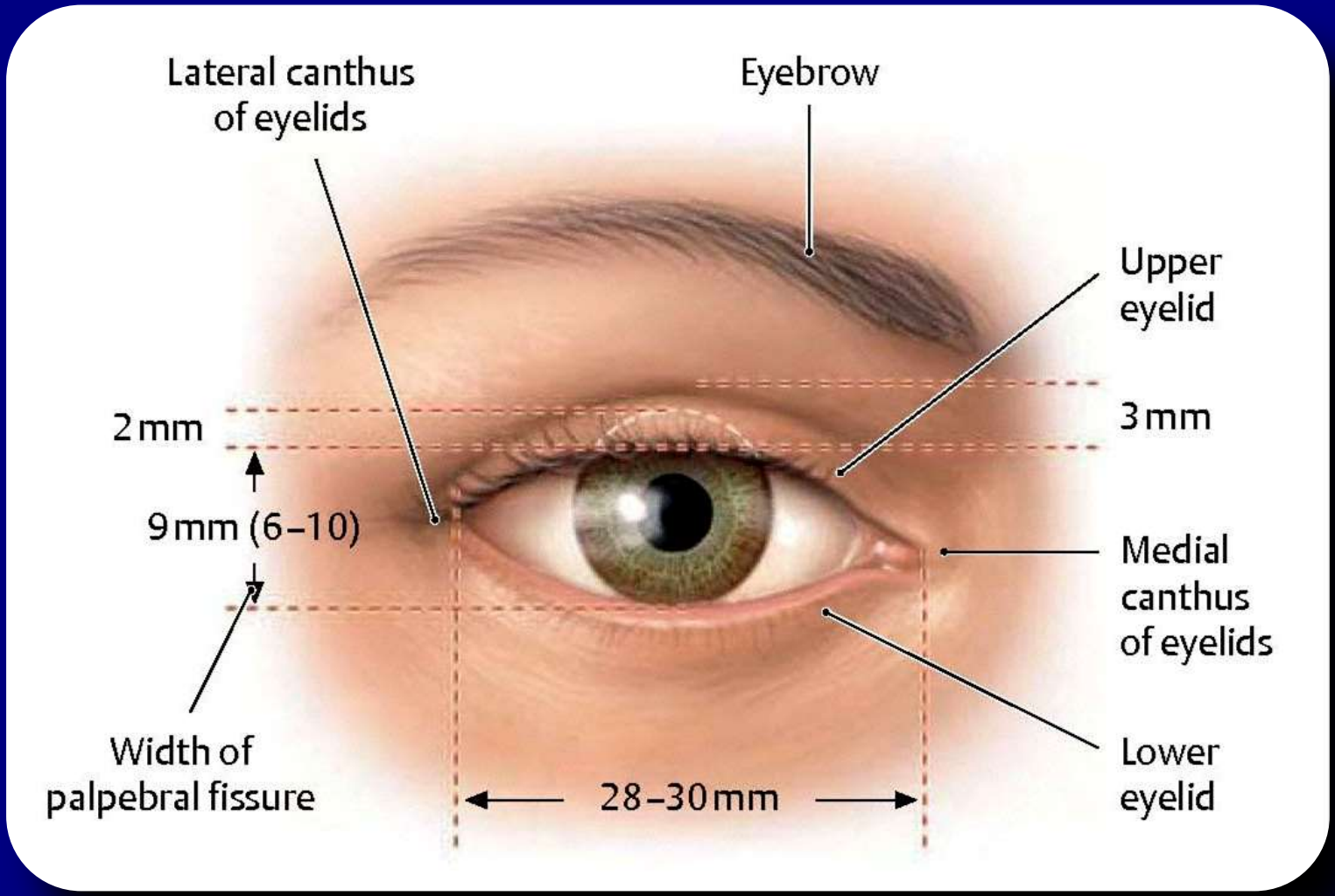
THE EYE

Thieme · Netter M.D. · Sobotta · GRAY'S Anatomy

Multimedial Unit of Dept. of Anatomy JU

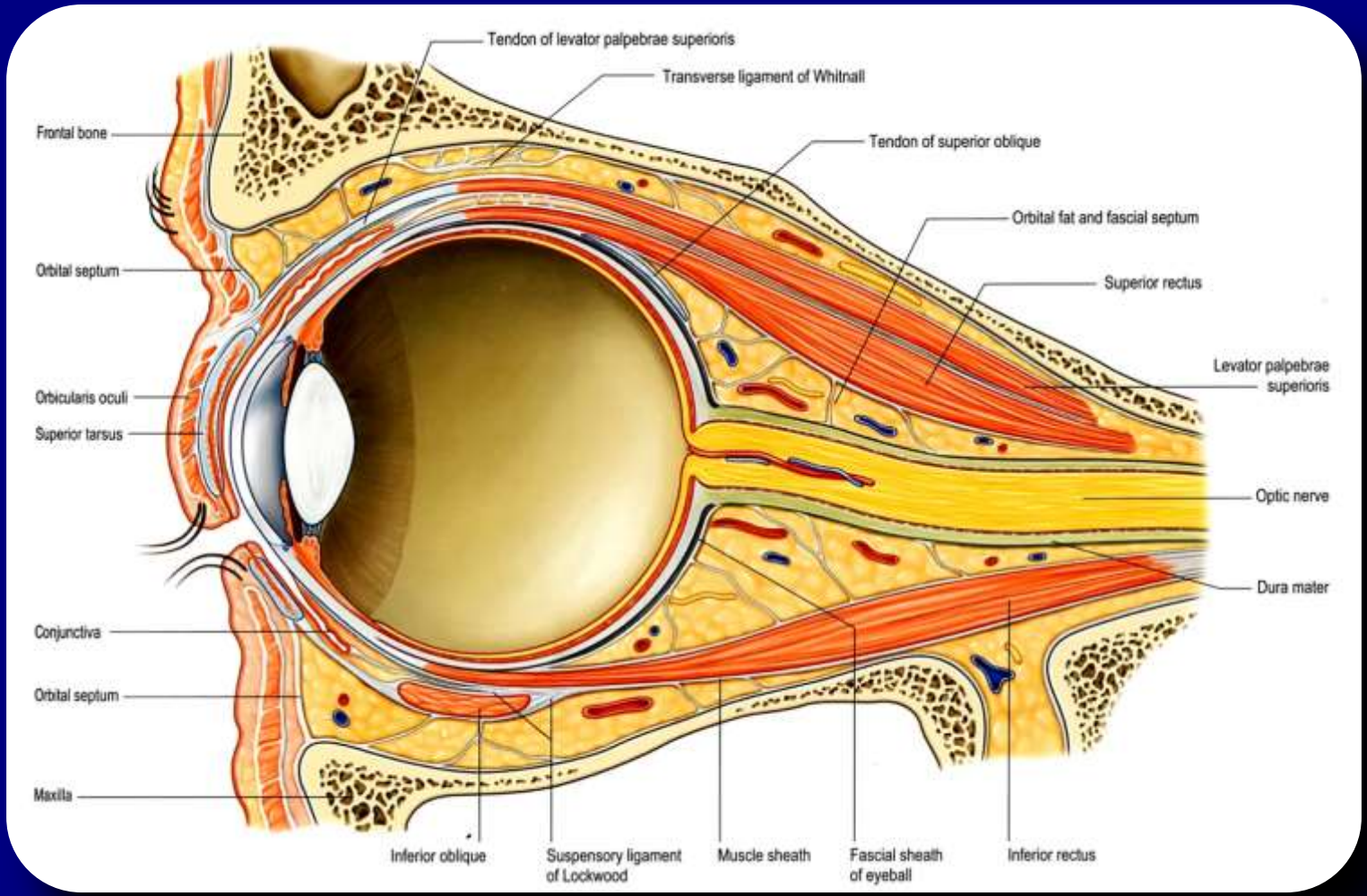
Skull: anterior view. Rifht orbit: frontal and lateral view



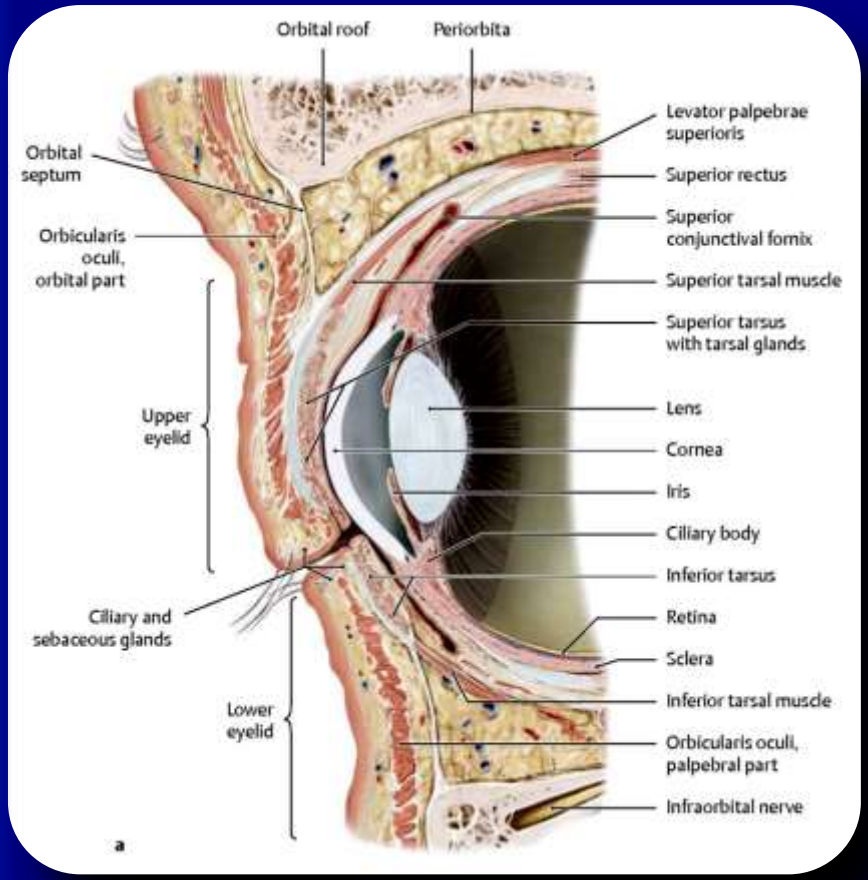
Surface anatomy of the eye

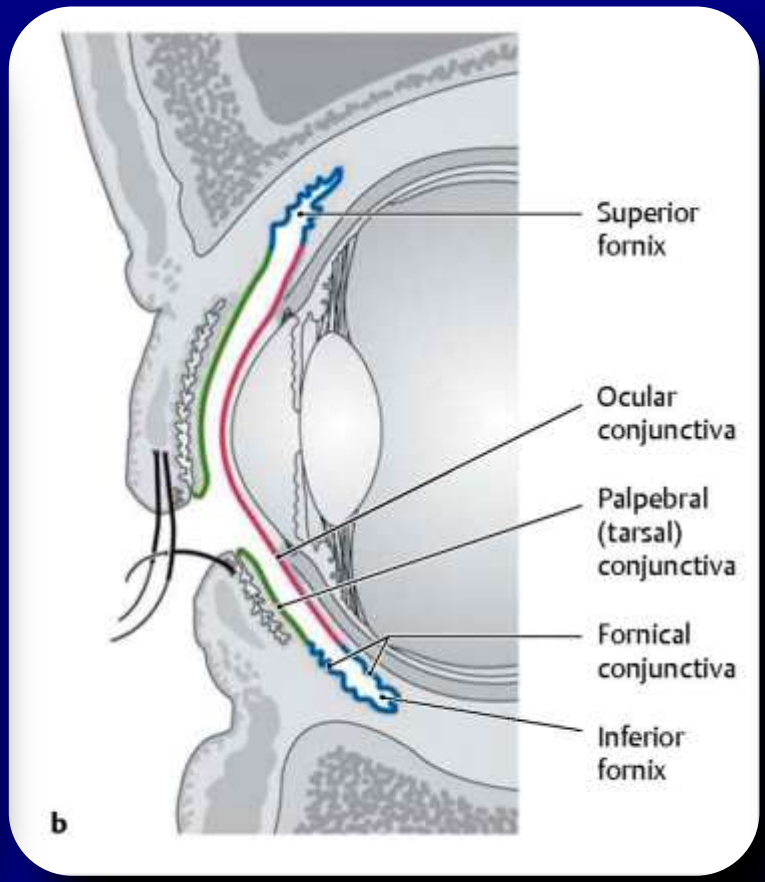
Question:

- Which muscle elevates the upper eyelid and which muscle constricts the eyelids?
- What is the innervation of these muscles?

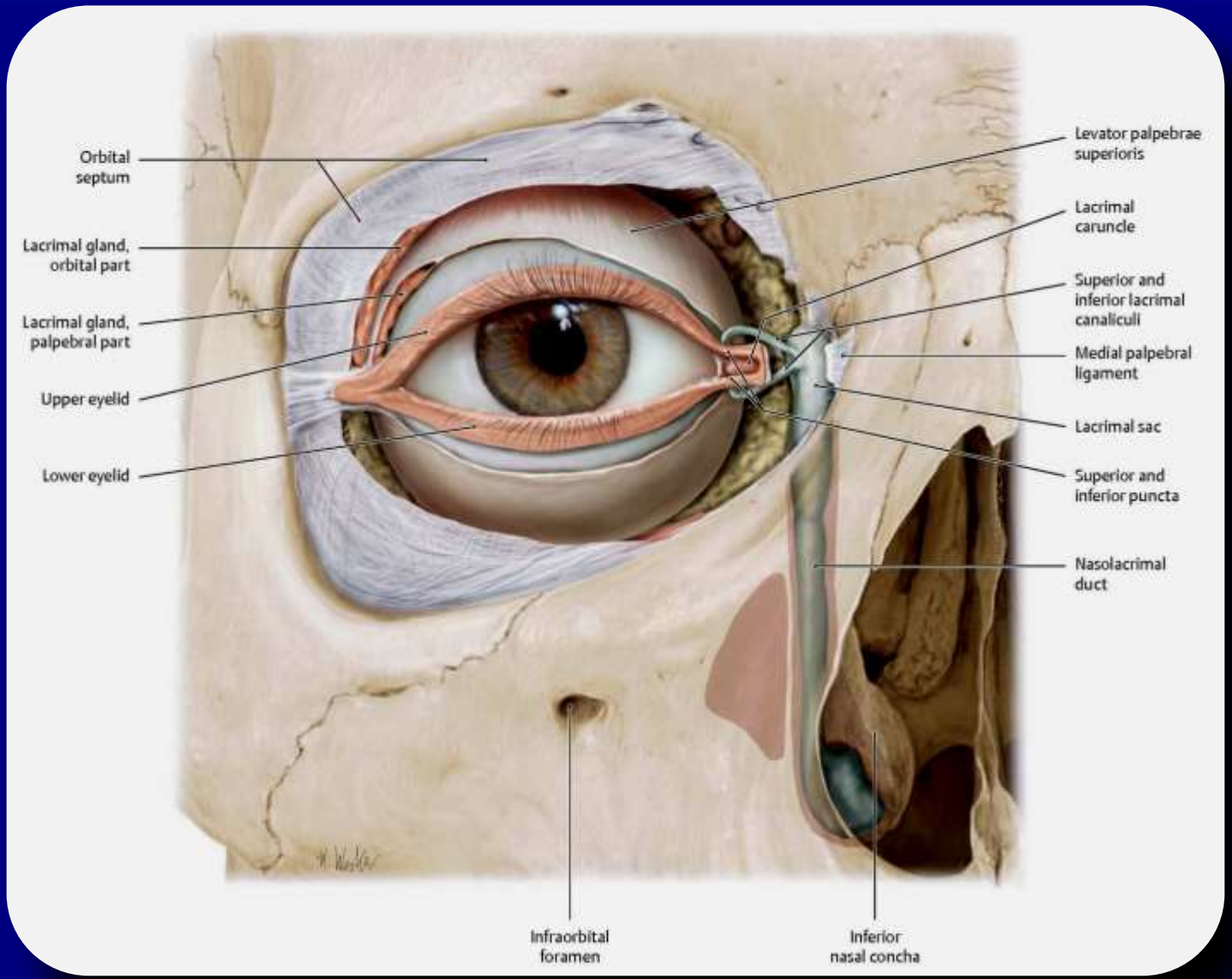


The contents of the orbit, sagittal section.

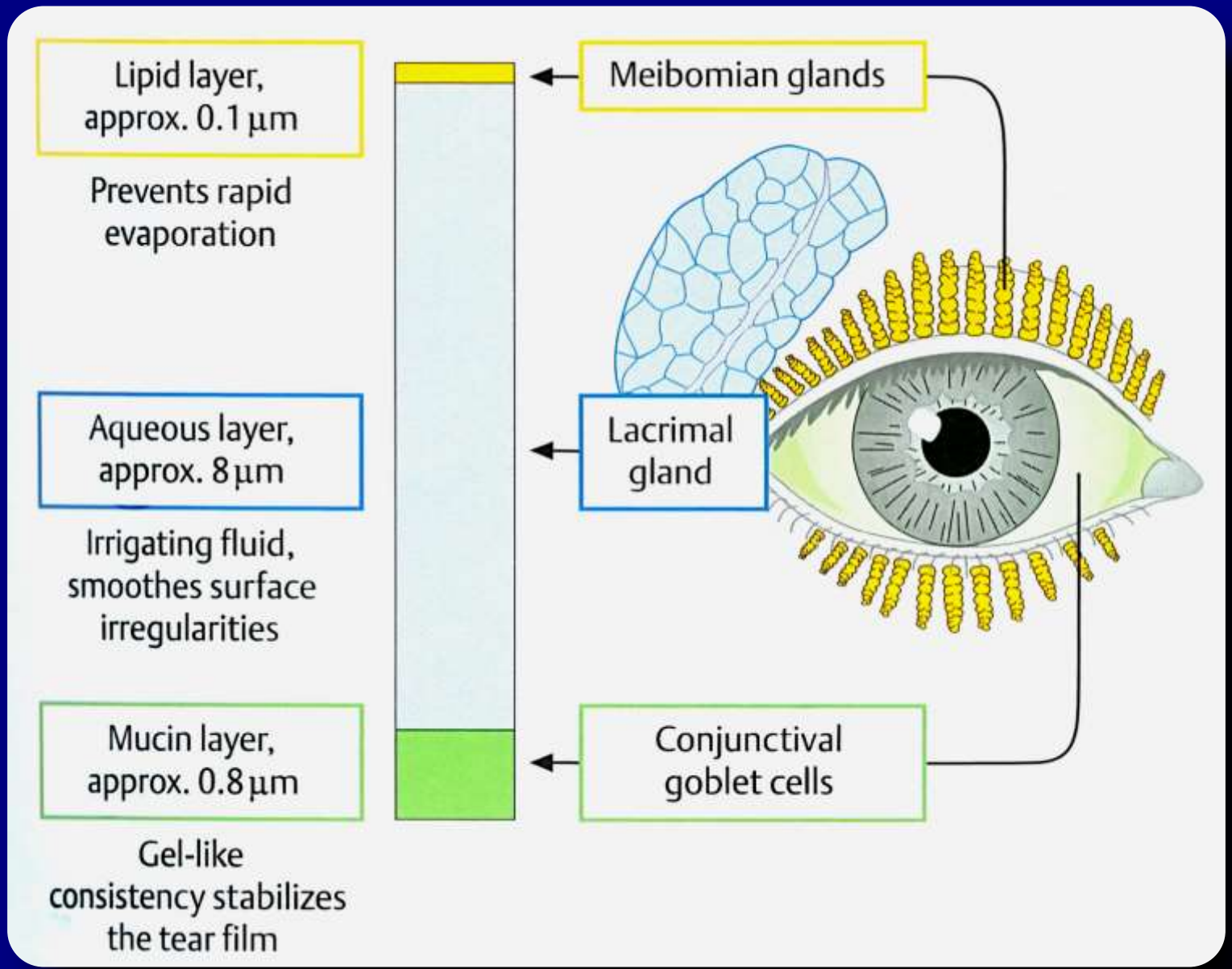


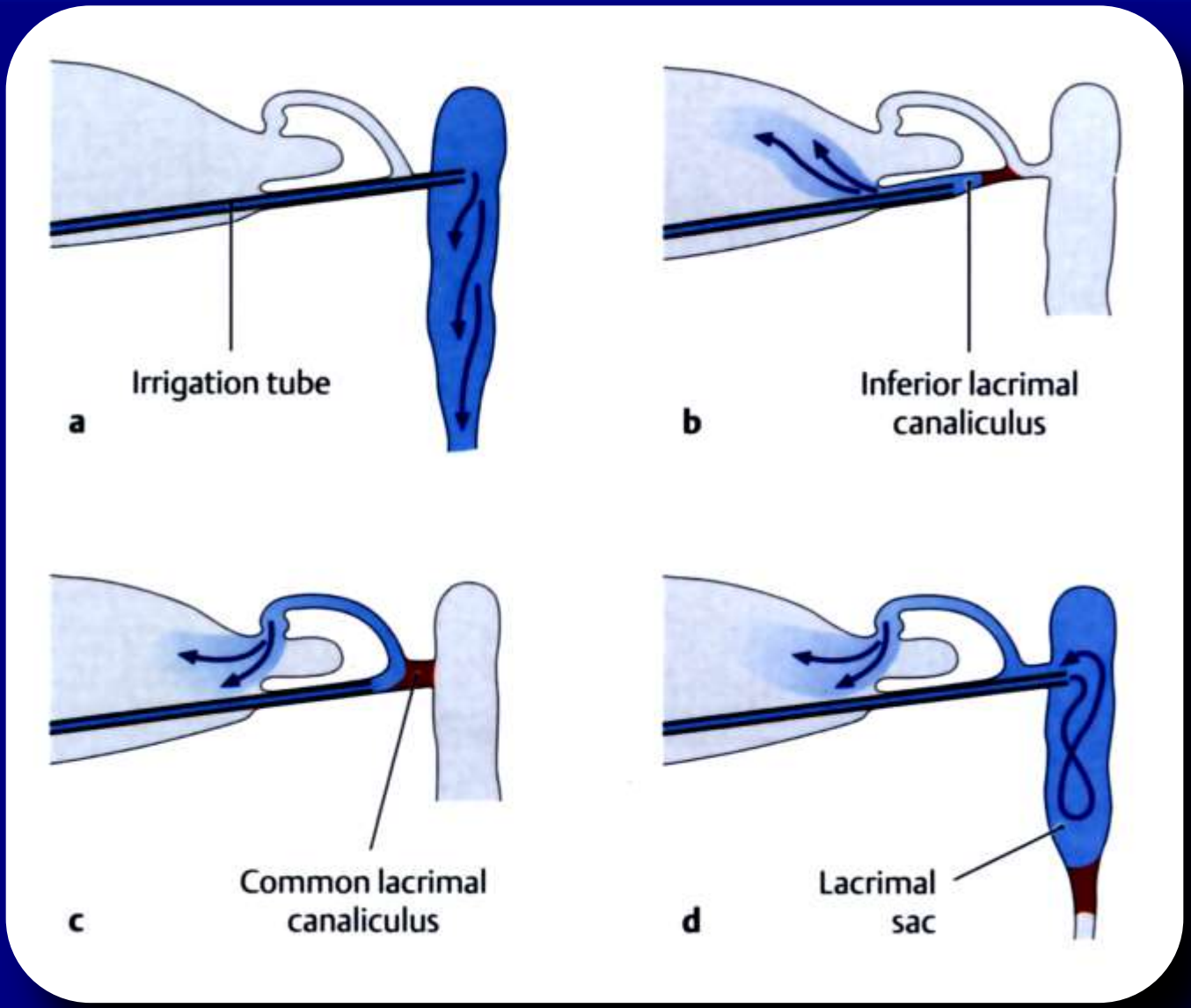


Structure of the eyelids and conjunctiva



Lacrimal apparatus

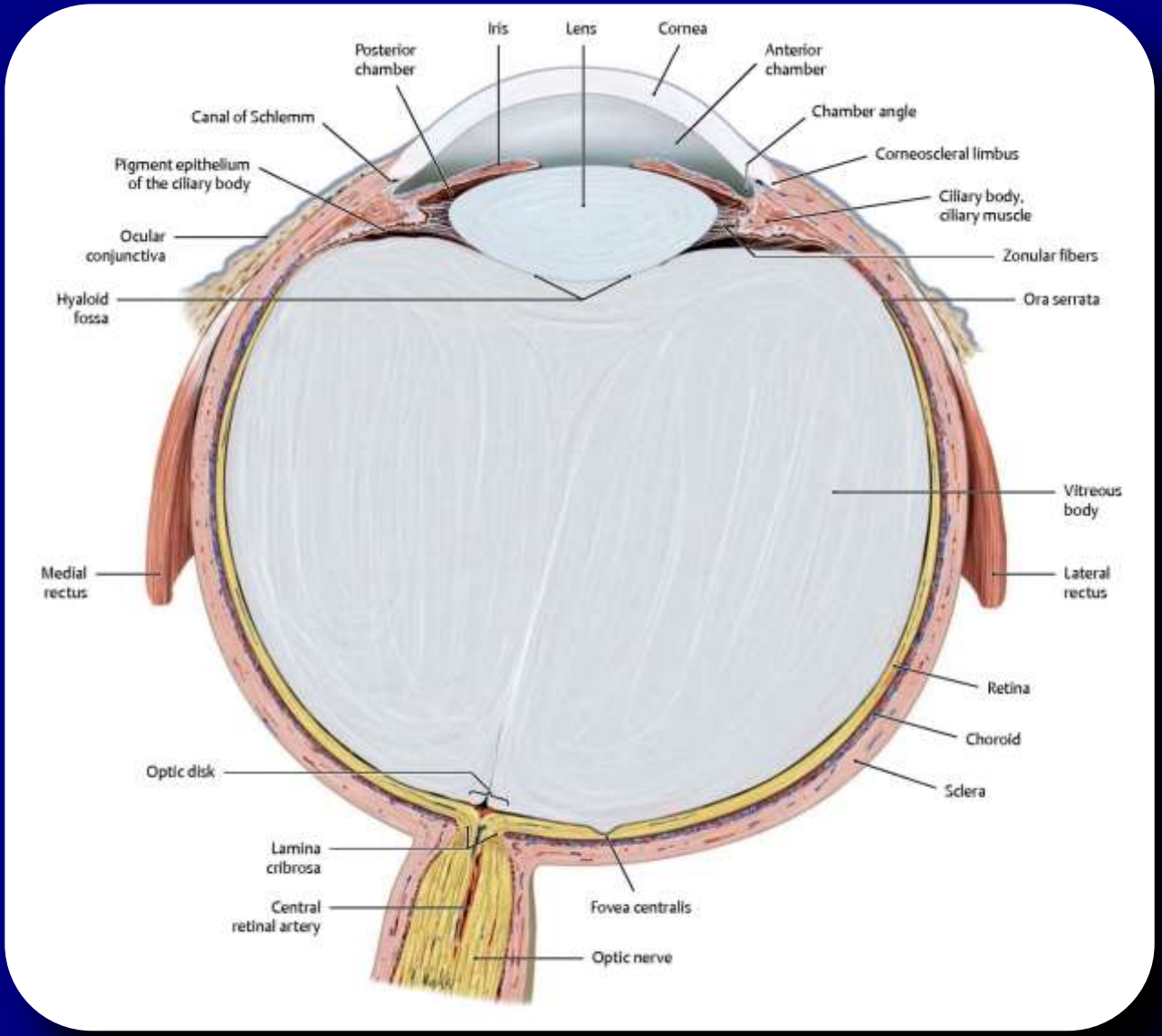

Lipid layer, approx. 0.1 µm
Prevents rapid evaporation
Aqueous layer, approx. 8 µm
Irrigating fluid, smoothes surface irregularities
Mucin layer, approx. 0.8 µm
Gel-like consistency stabilizes the tear film
Meibomian glands
Lacrimal gland
Conjunctival goblet cells



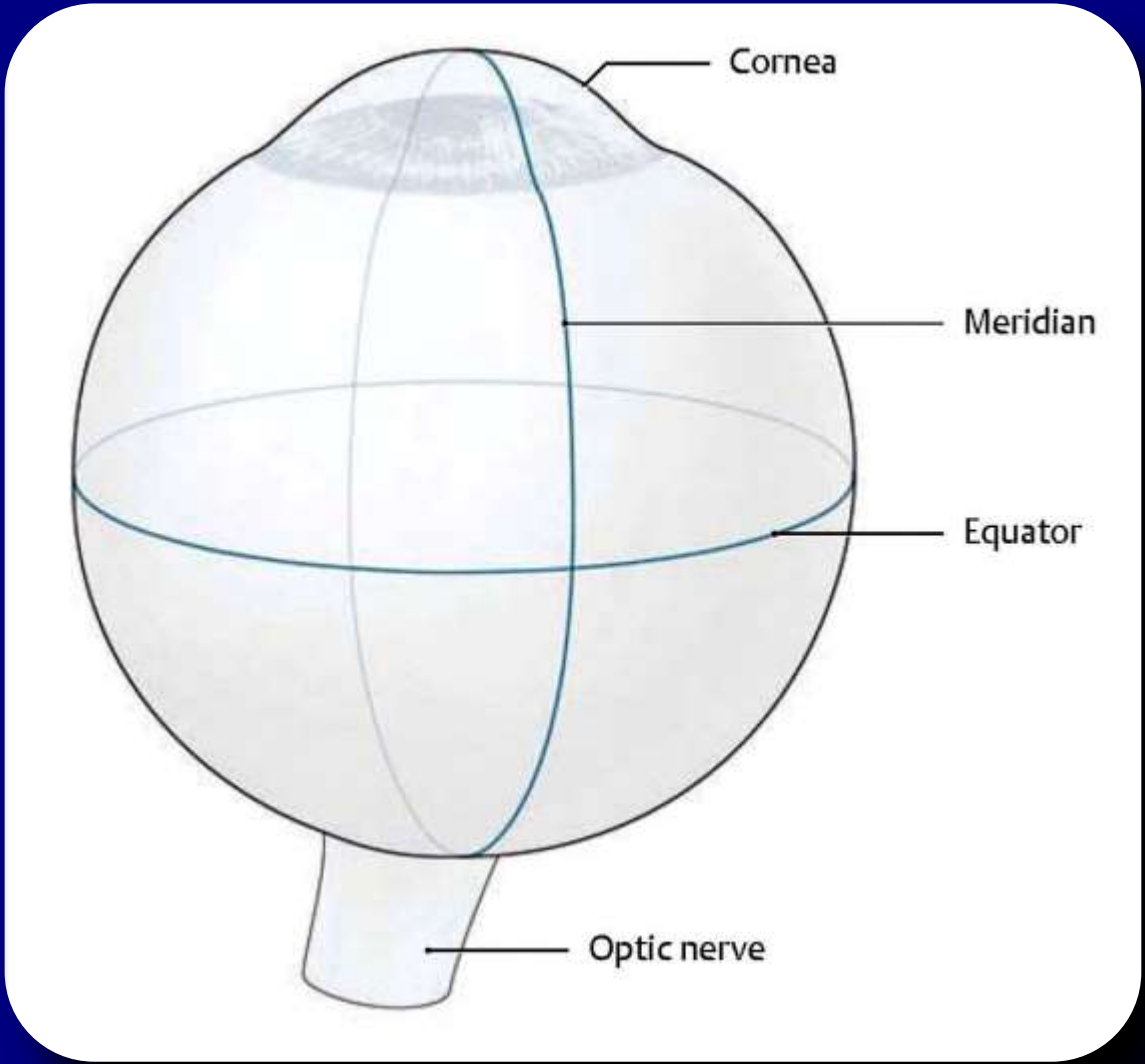
Obstructions to lacrimal drainage

Question:

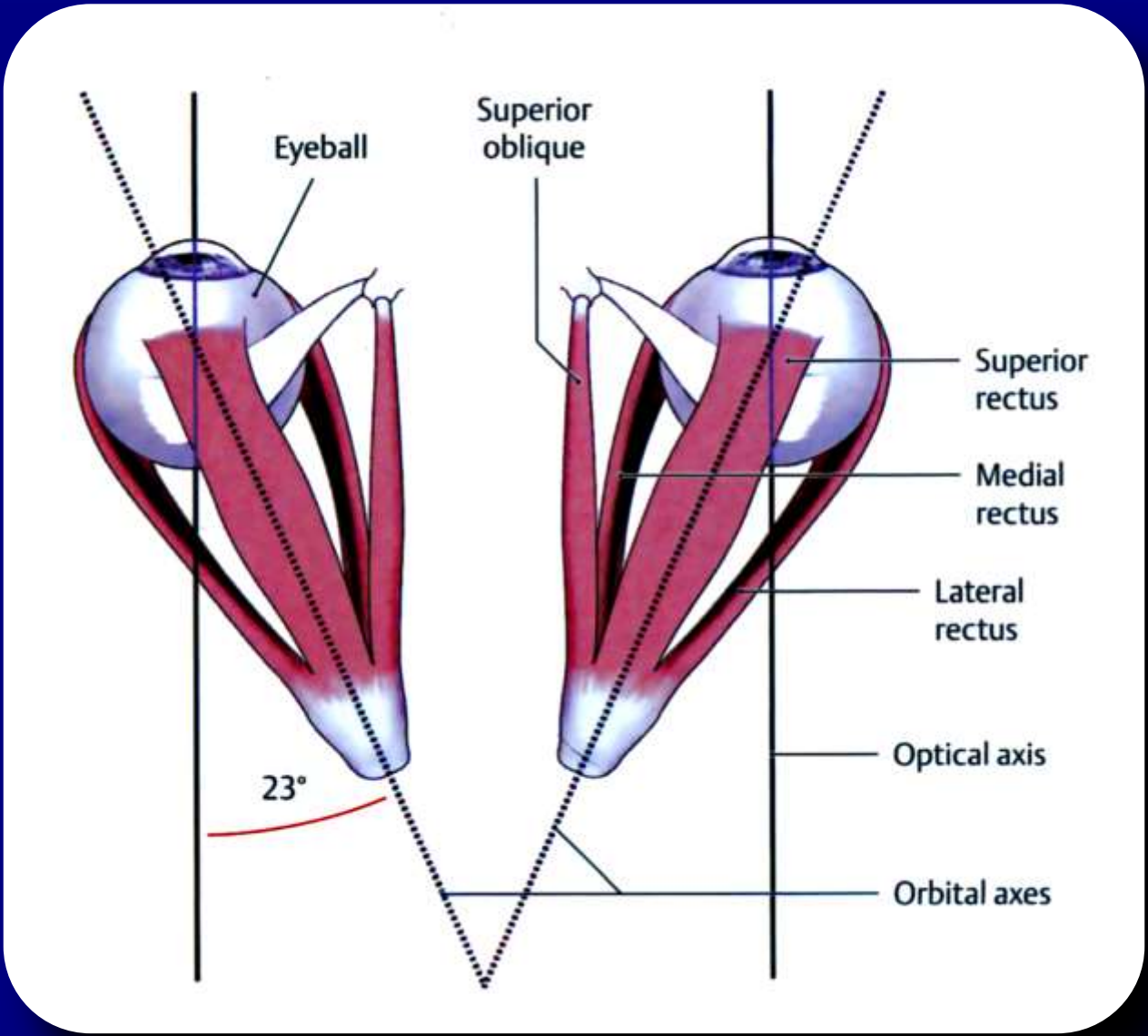
- Paralysis of which nerve (nerves) may cause the eye to dry out? Try to guess why?



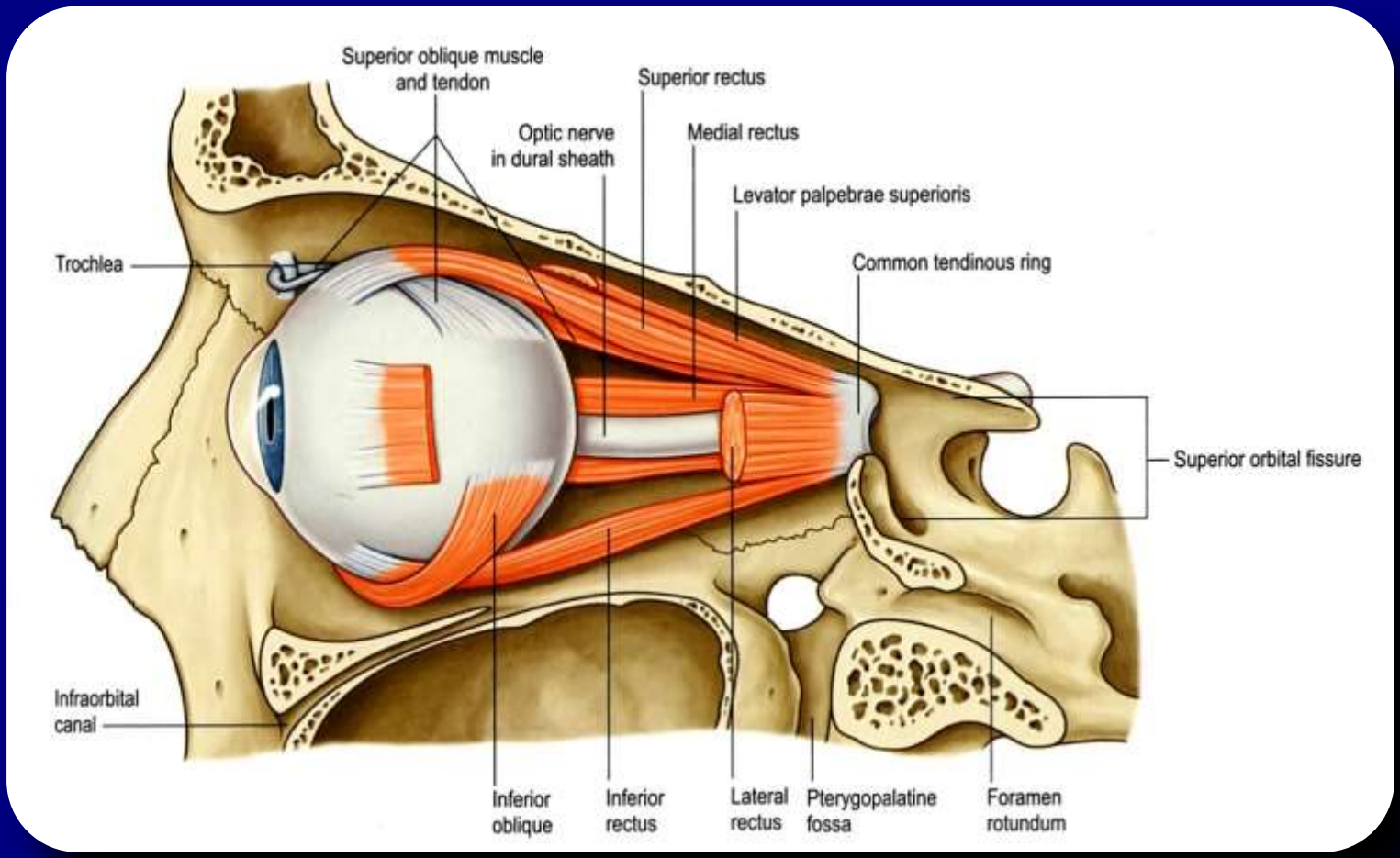
Transverse section through the eyeball



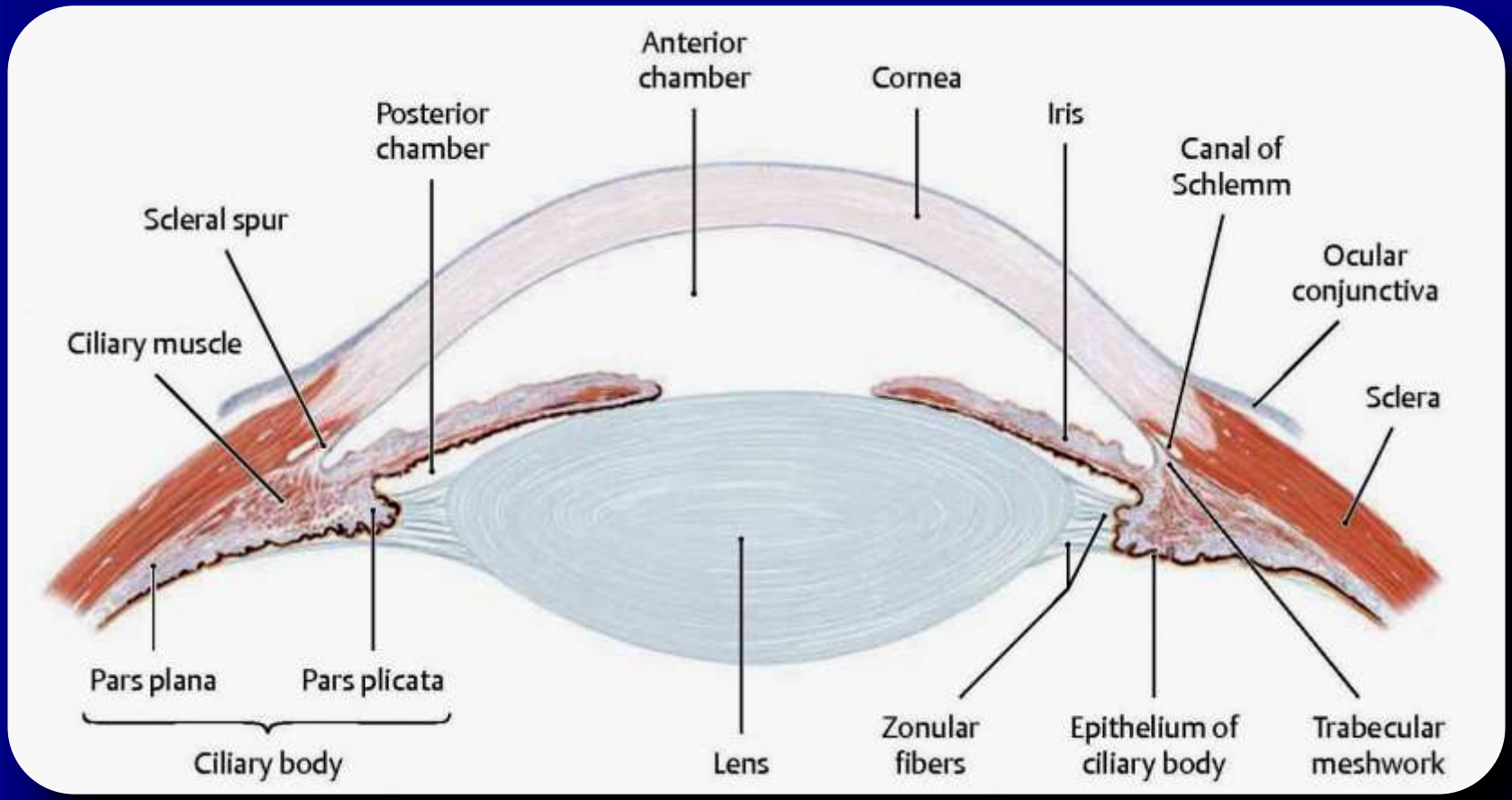
Reference lines and points on the eye



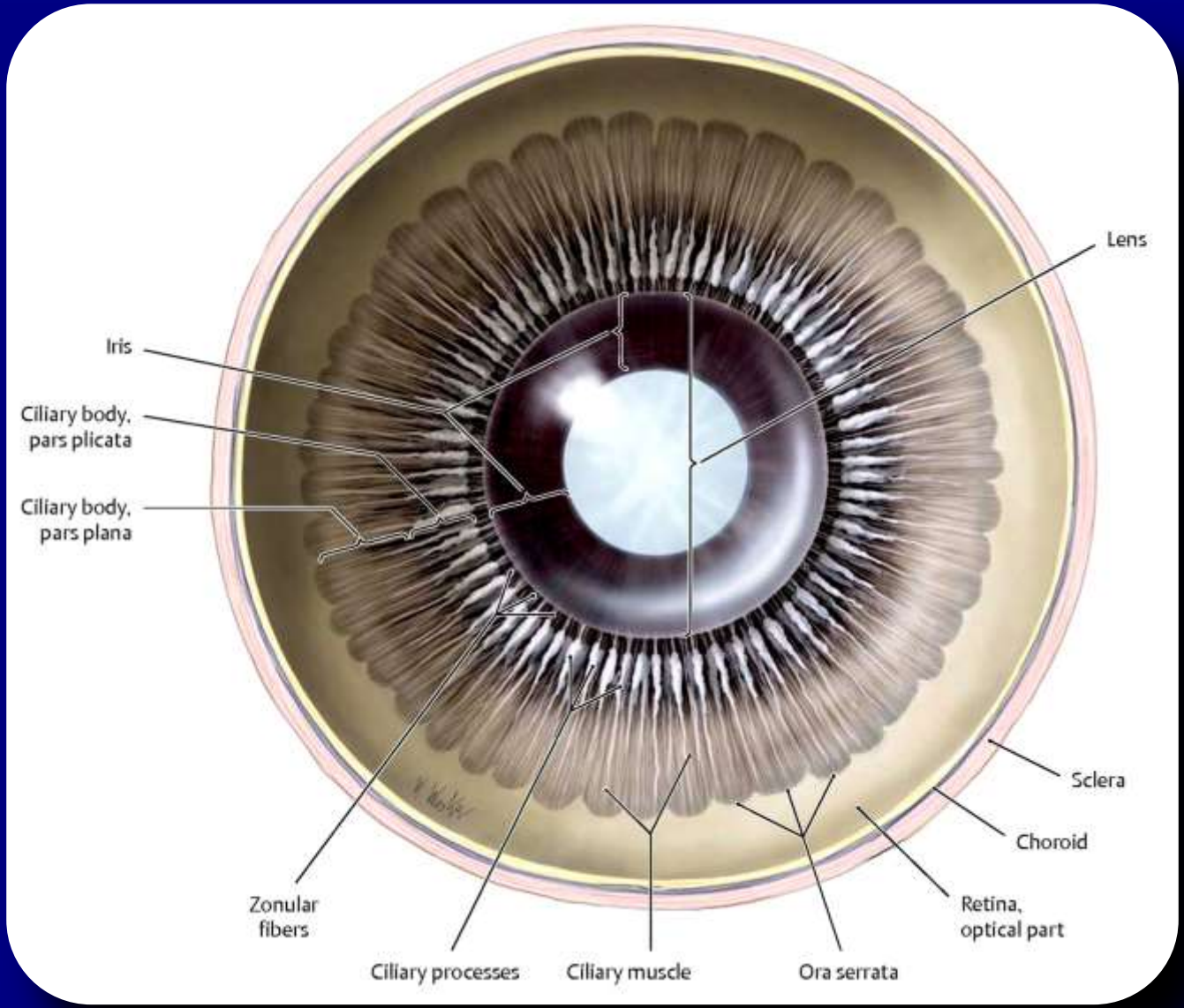
Optical axis and orbital axis



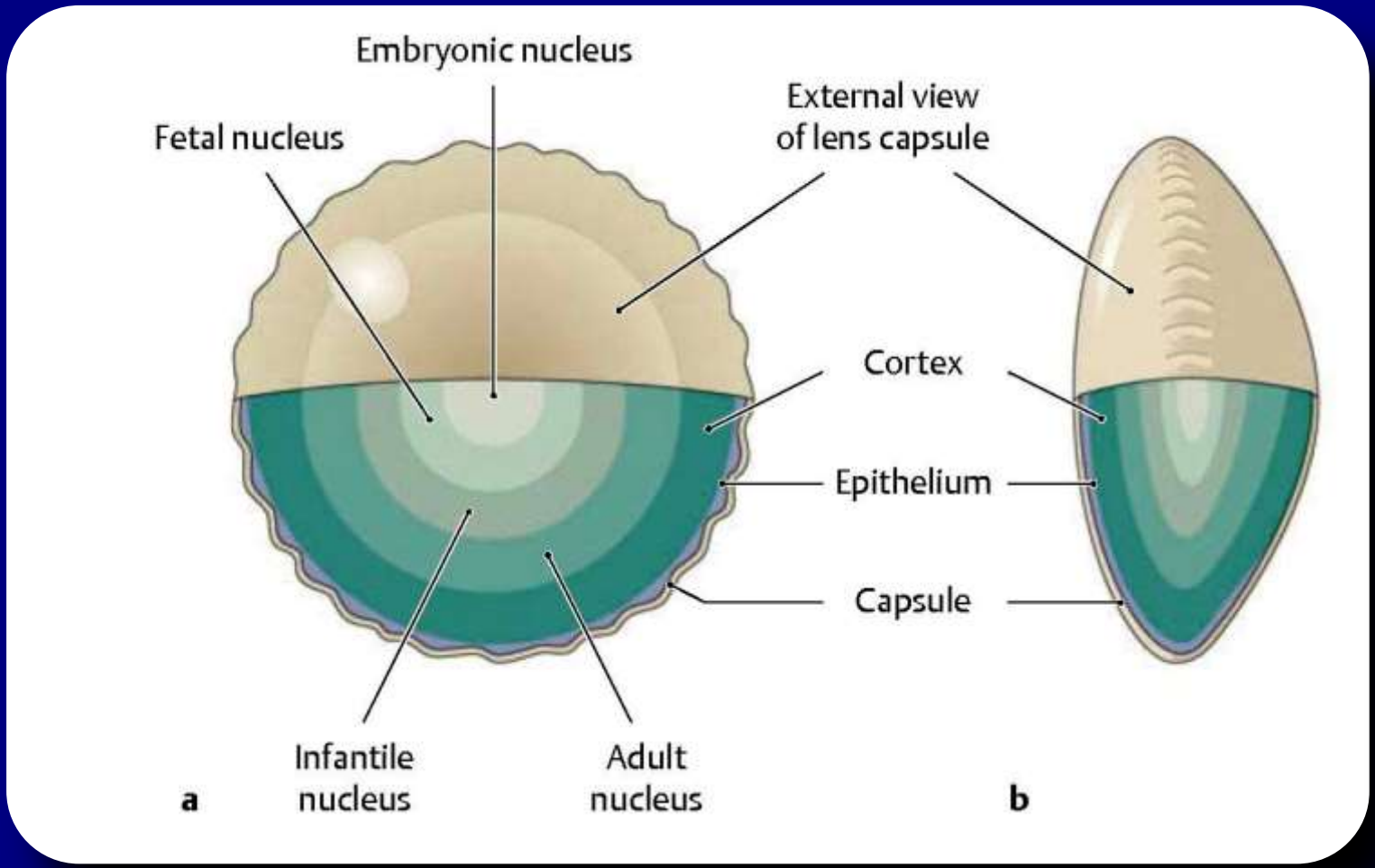
The muscles of the left orbit, lateral view.



Position ofthe lens and cornea in the eyeball



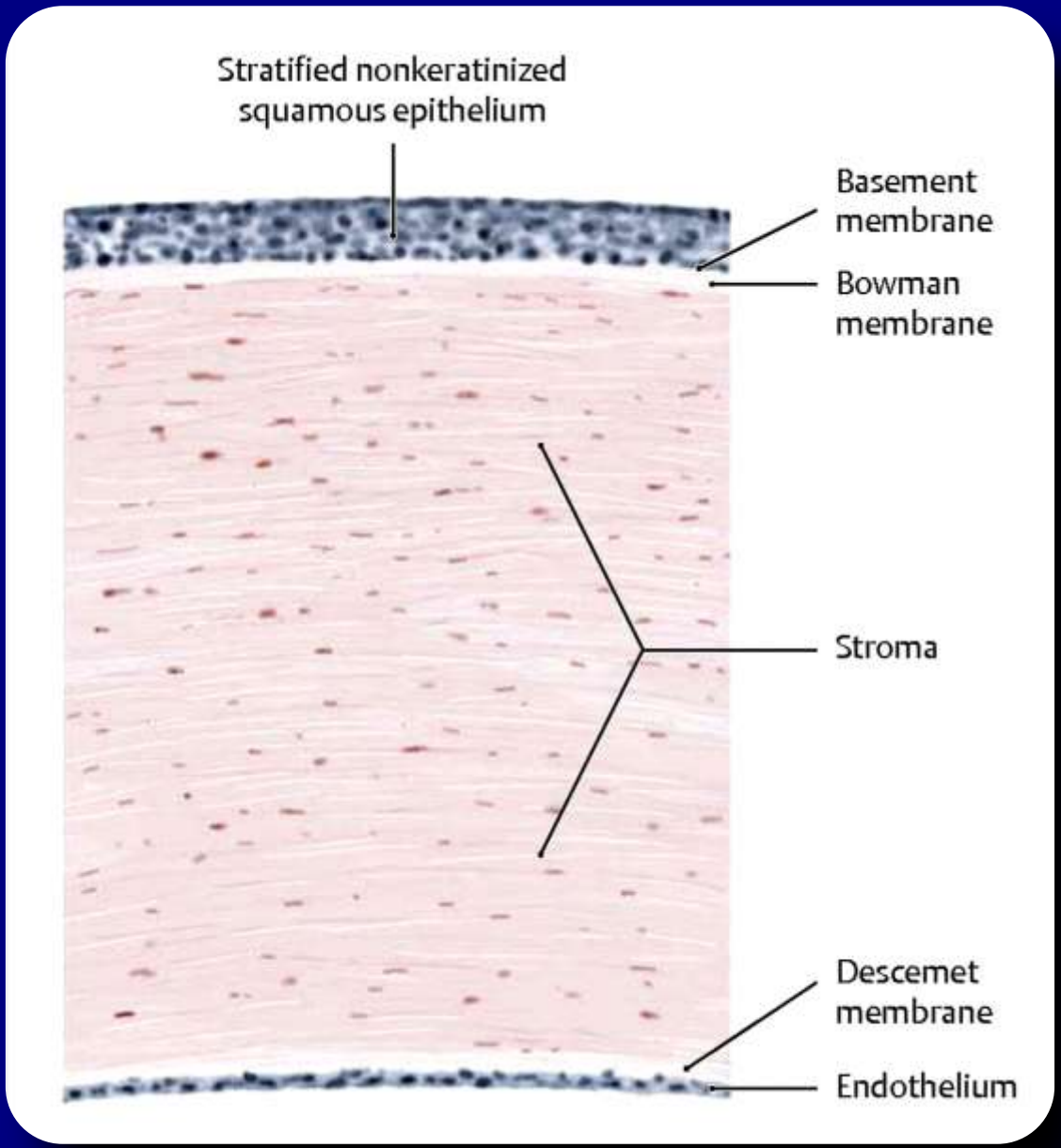
The lens and ciliary body



Growth of the lens and zones of discontinuity

Question:

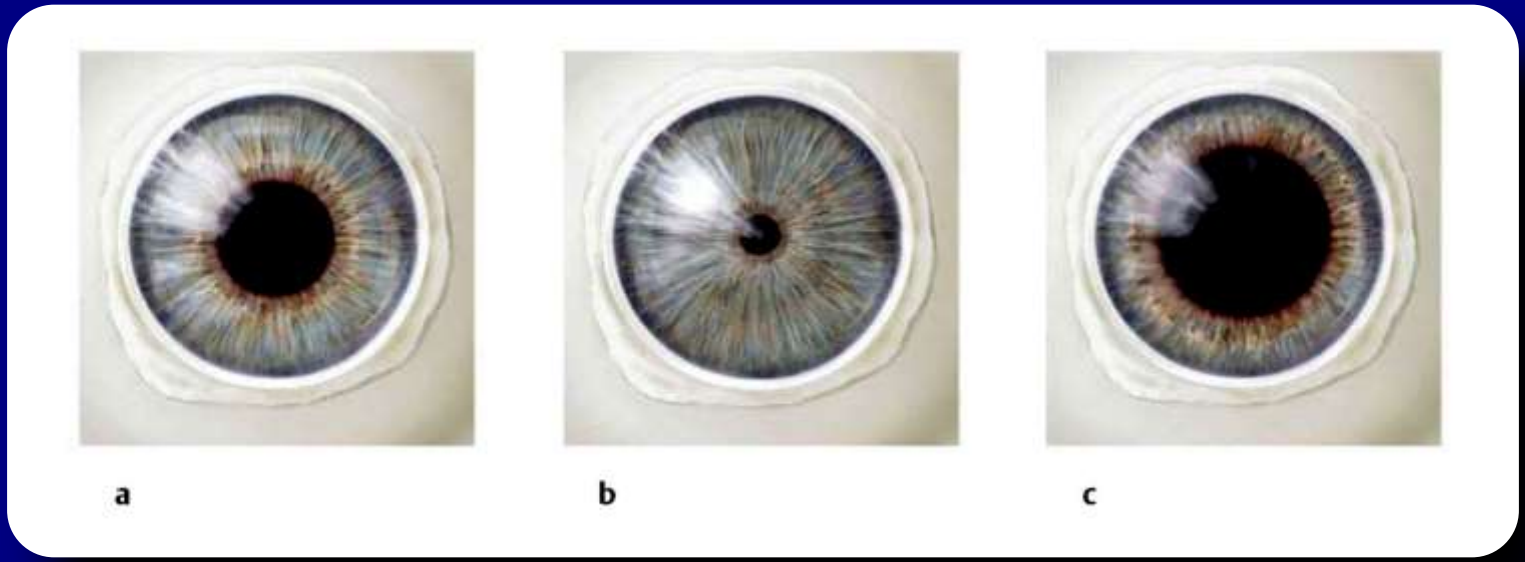
- What is cataract?



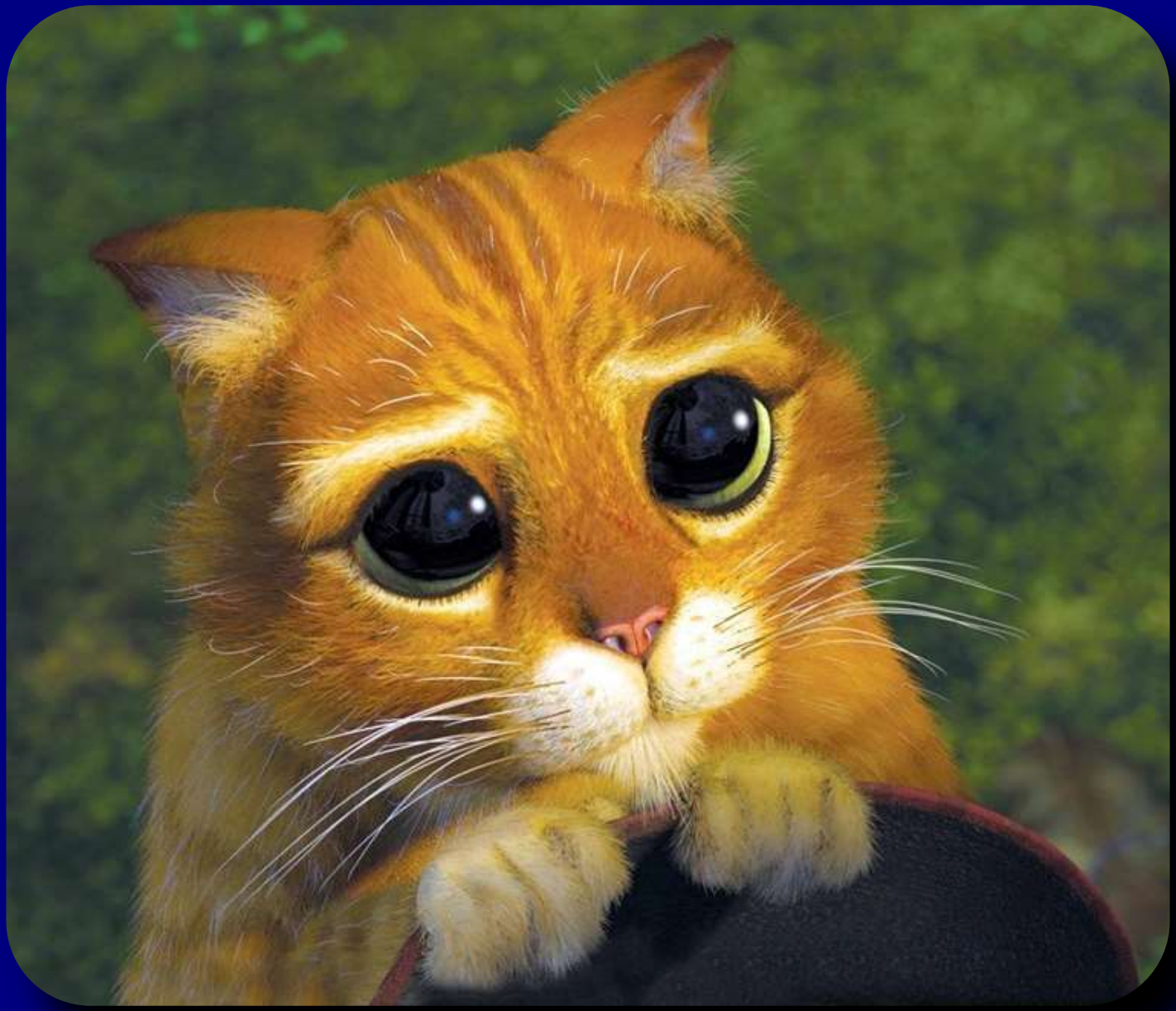
Structure of the cornea

Question:

- Why a corneal transplant can be performed without rejection response?



Pupil size

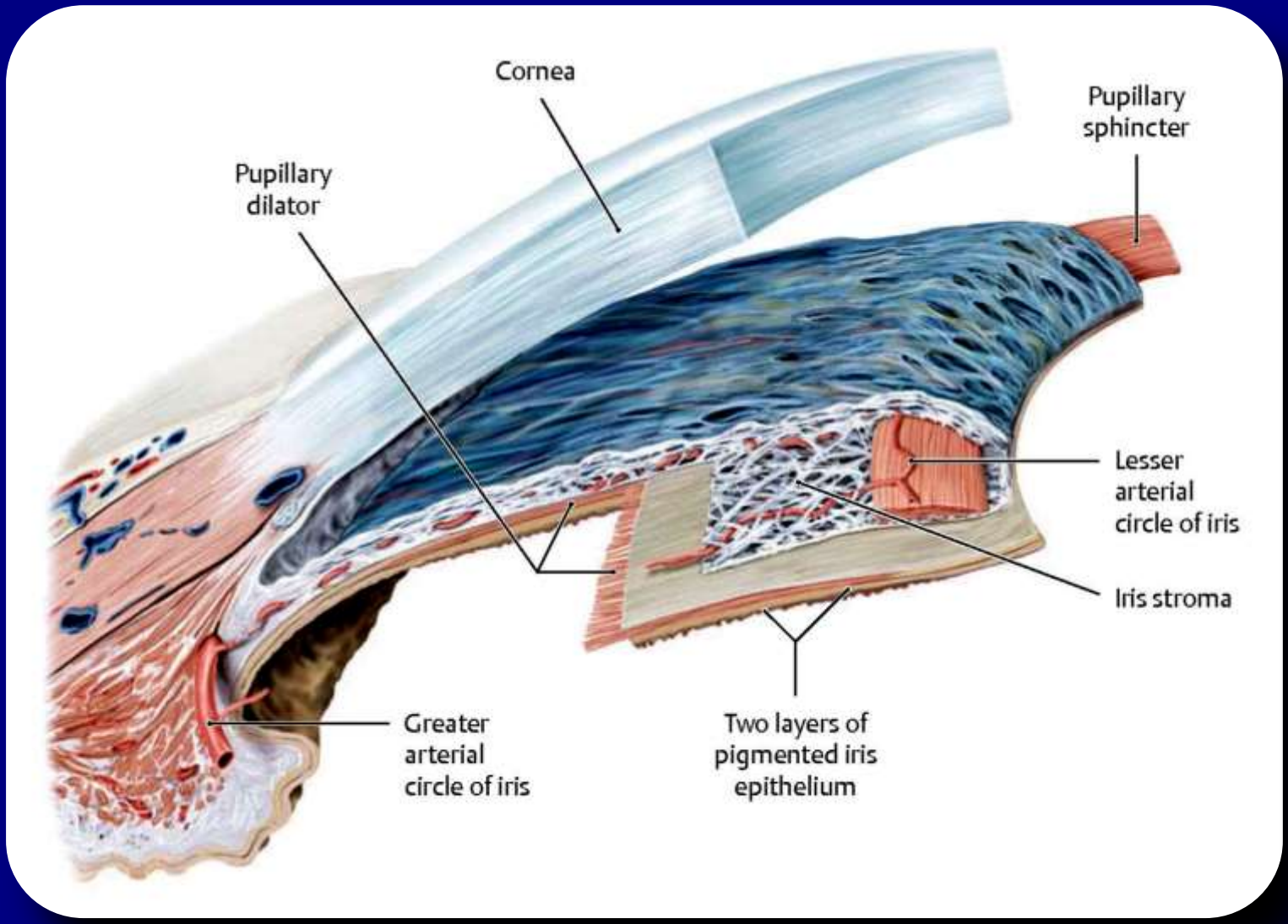


Question:

- Try to guess what may cause changes of the pupil size?

Miosis (Bb)	Mydriasis (Bc)
Light	Darkness
Sleep, fatigue	Pain, excitement
Miotic agents (parasympatho-mimetics, sympatholytics)	Mydriatic agents (parasympatholytics such as atropine, sympathomimetics such as epinephrine)
Horner syndrome (including ptosis and a narrow palpebral fissure)	Oculomotor palsy
General anesthesia, morphine	Migraine attack, glaucoma attack

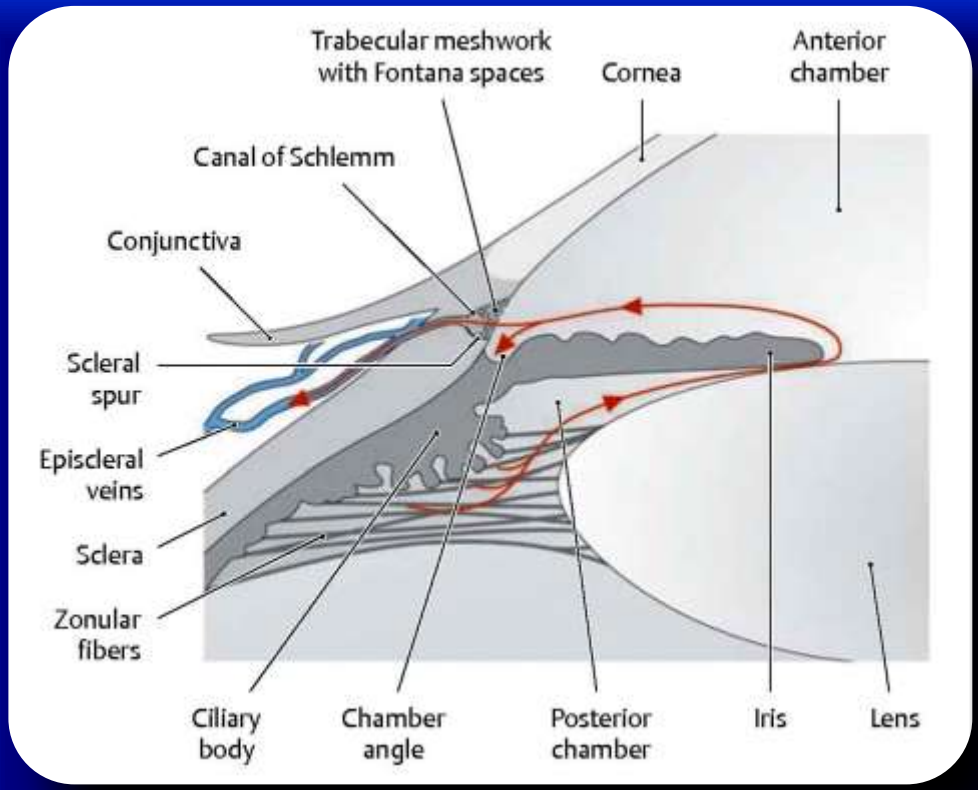
Causes of miosis and mydriasis



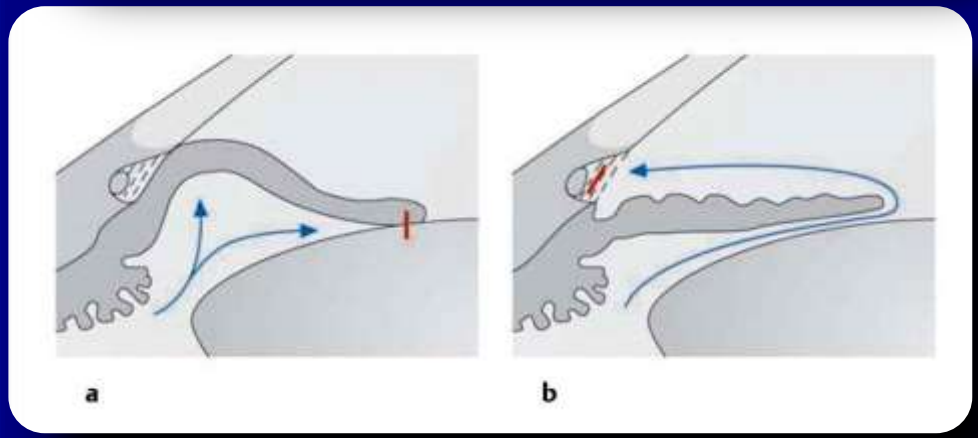
Structure of the iris

Question:

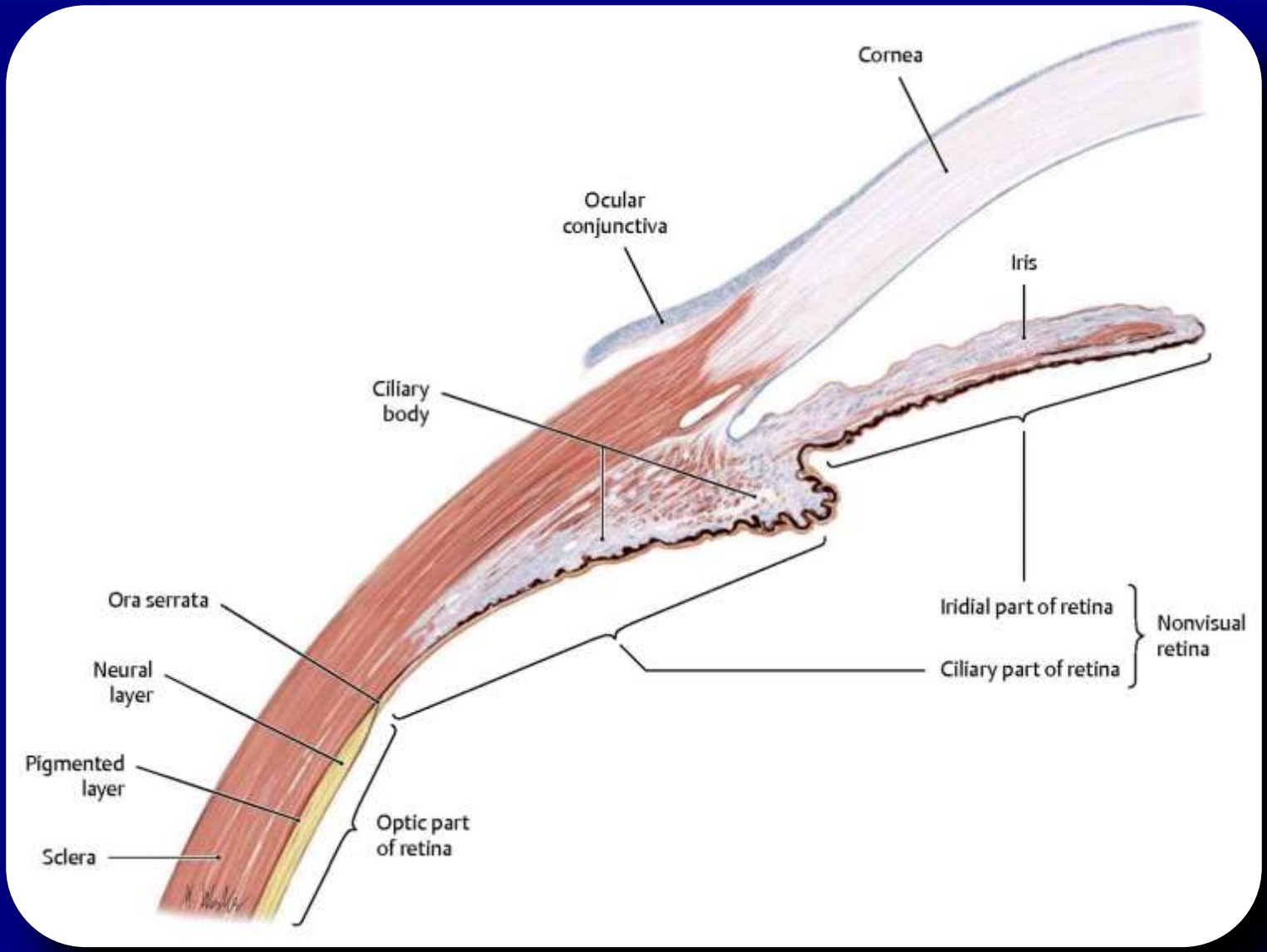
- What is glaucoma?



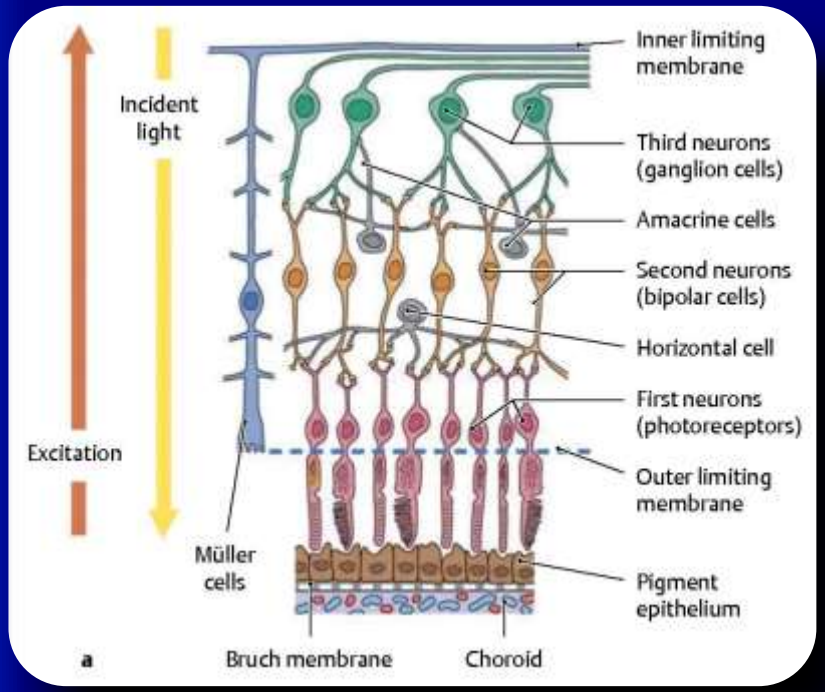
Normal drainage of aqueous humor

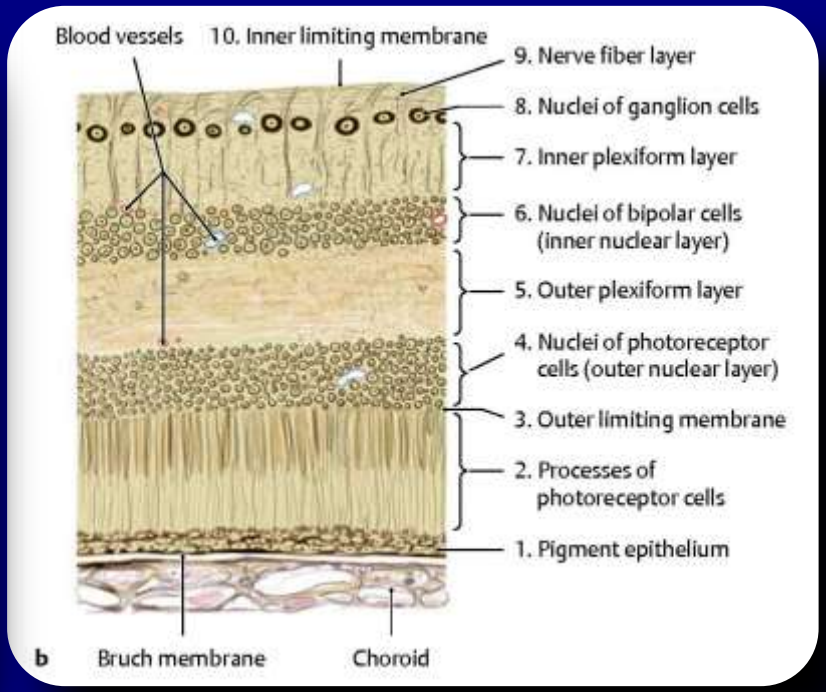


Obstruction of aqueous drainage and glaucoma



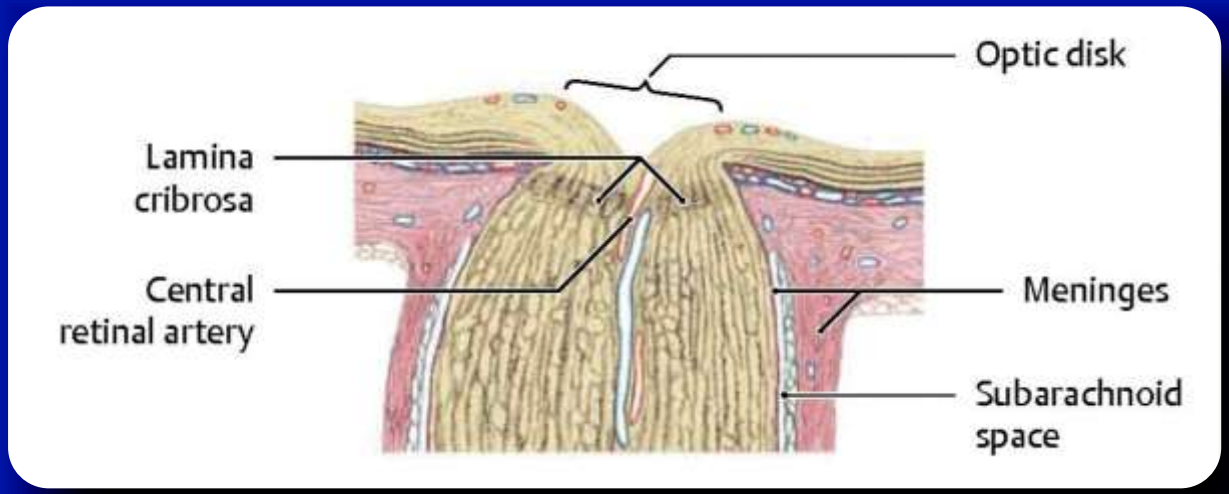
Parts of the retina



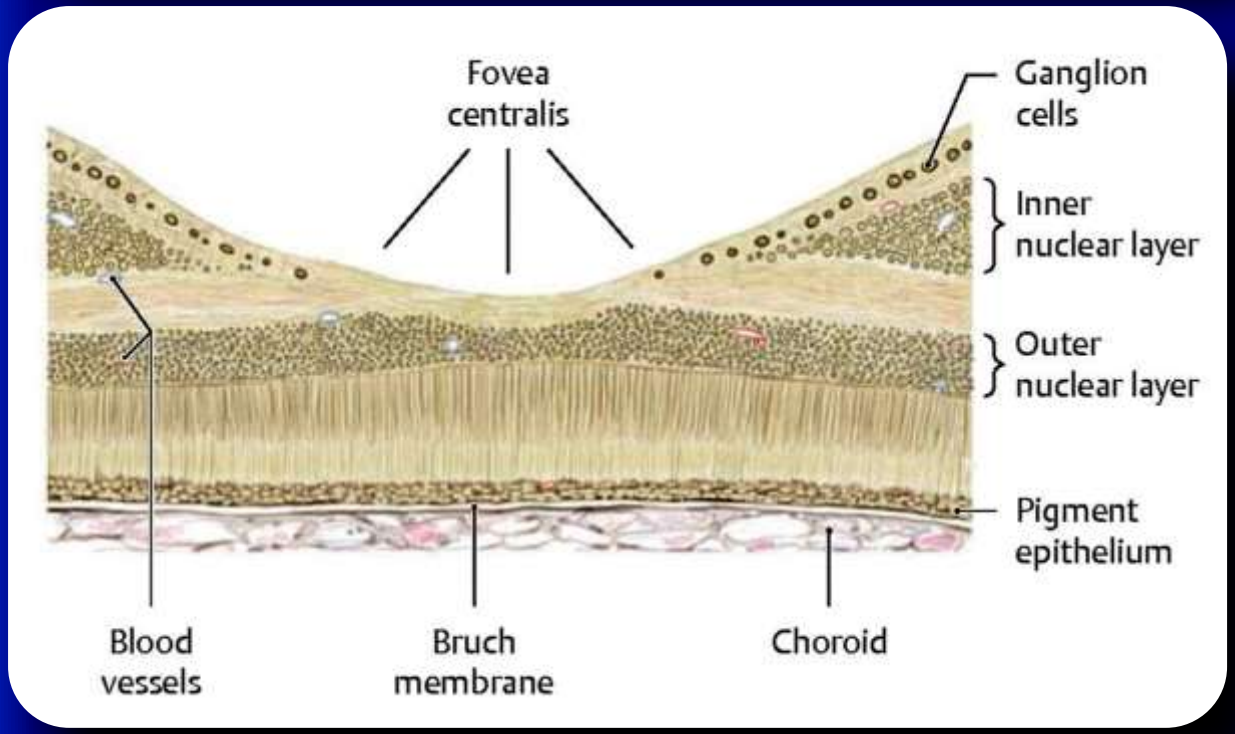


Structure of the retina

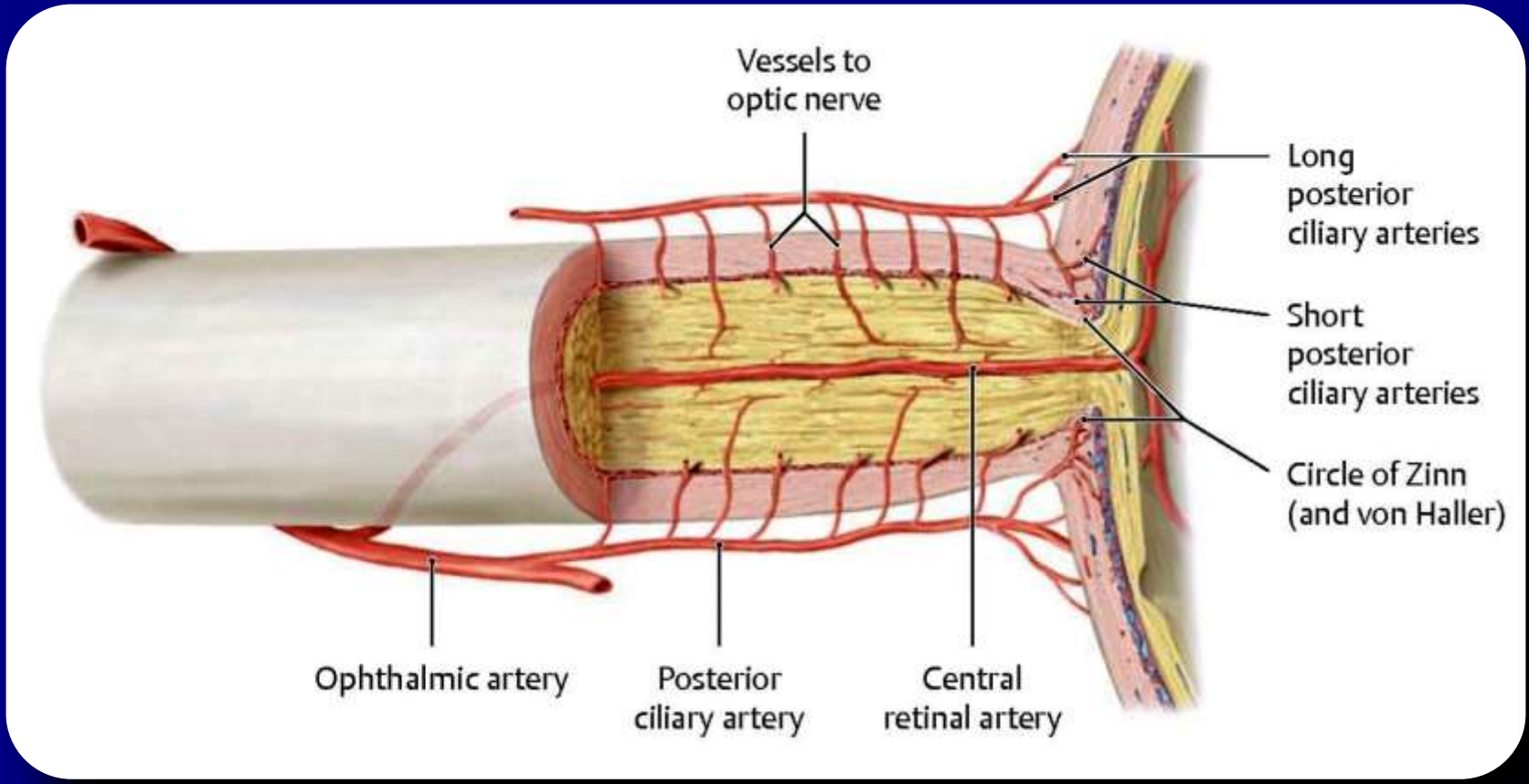
The retina contains 100-125 milion rods, which are responsible for twilight and night vision, but only about 6-7 milion cones (different cones are specialized for the perception of red, green, and blue).



Optic disk ("blind spot") and lamina cribrosa



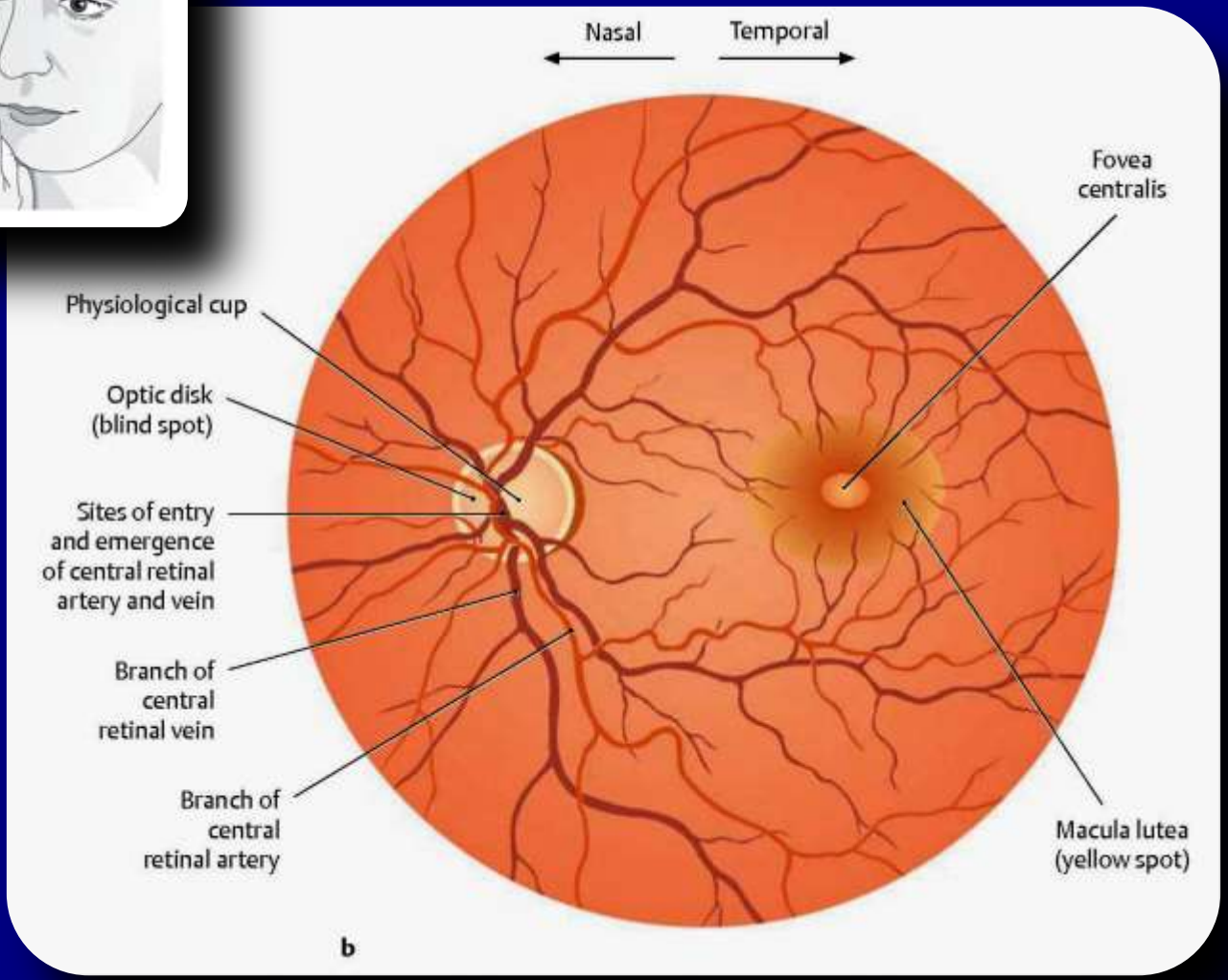
Macula lutea and fovea centralis



Arterial blood supply of the optic nerve and optic nerve head

Question:

- What can you see during ophthalmoscopic examination of the optic fundus?



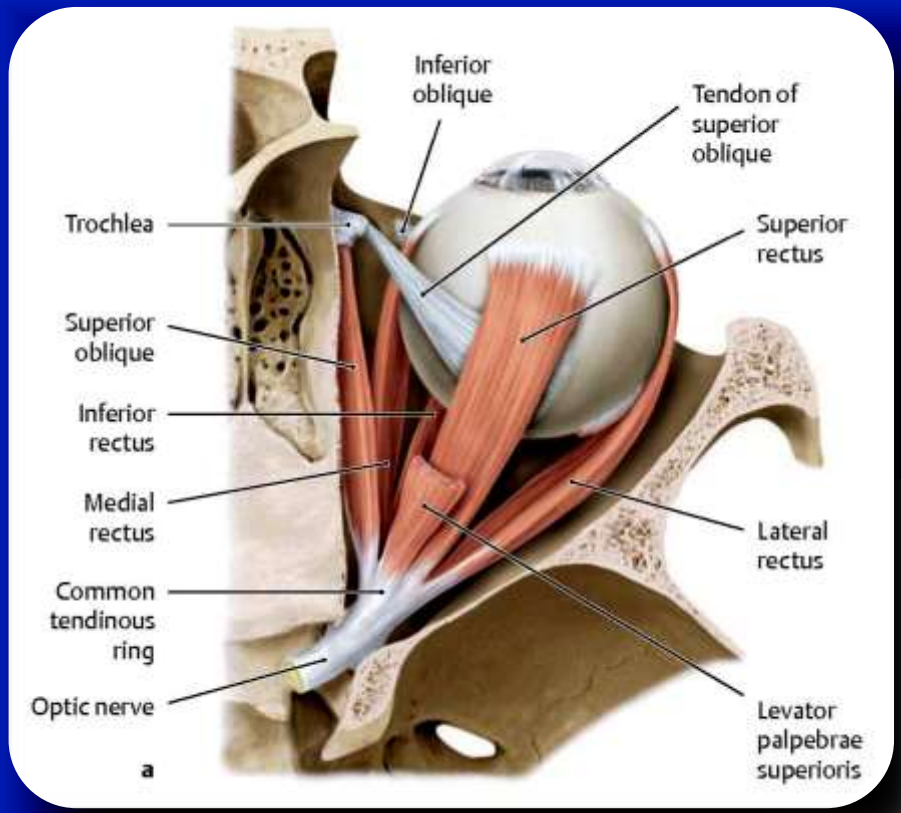
Ophthalmoscopicexamination of the optic fundus

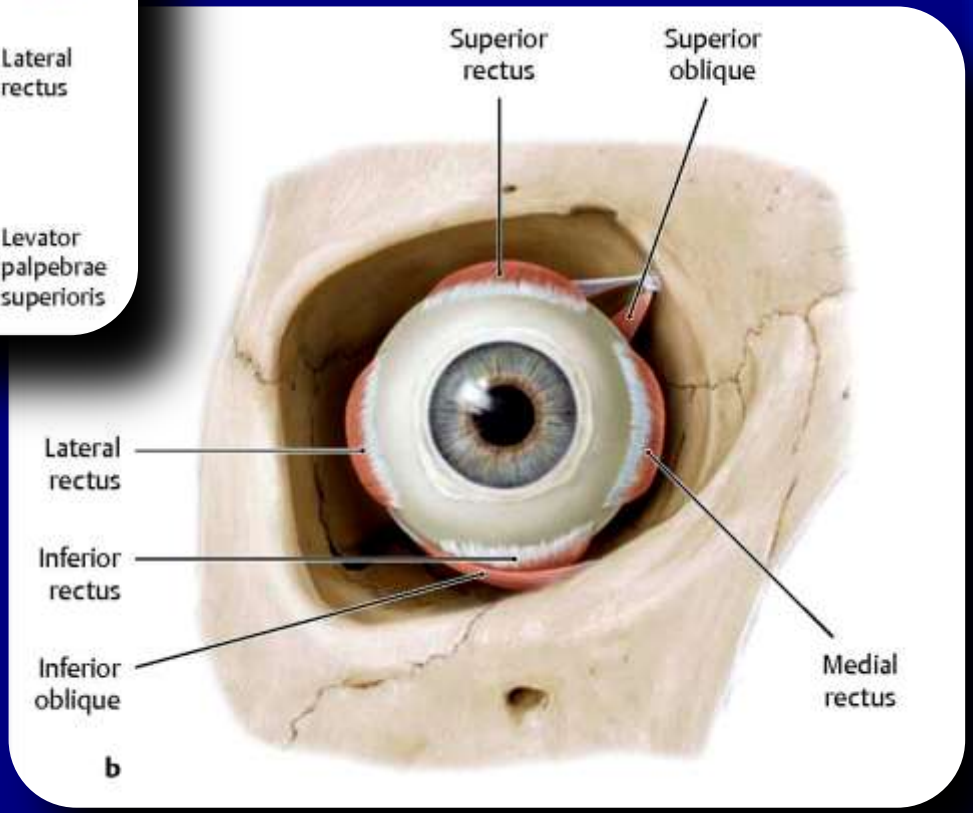
In direct ophthalmoscopy, the following structures can be directly evaluated:

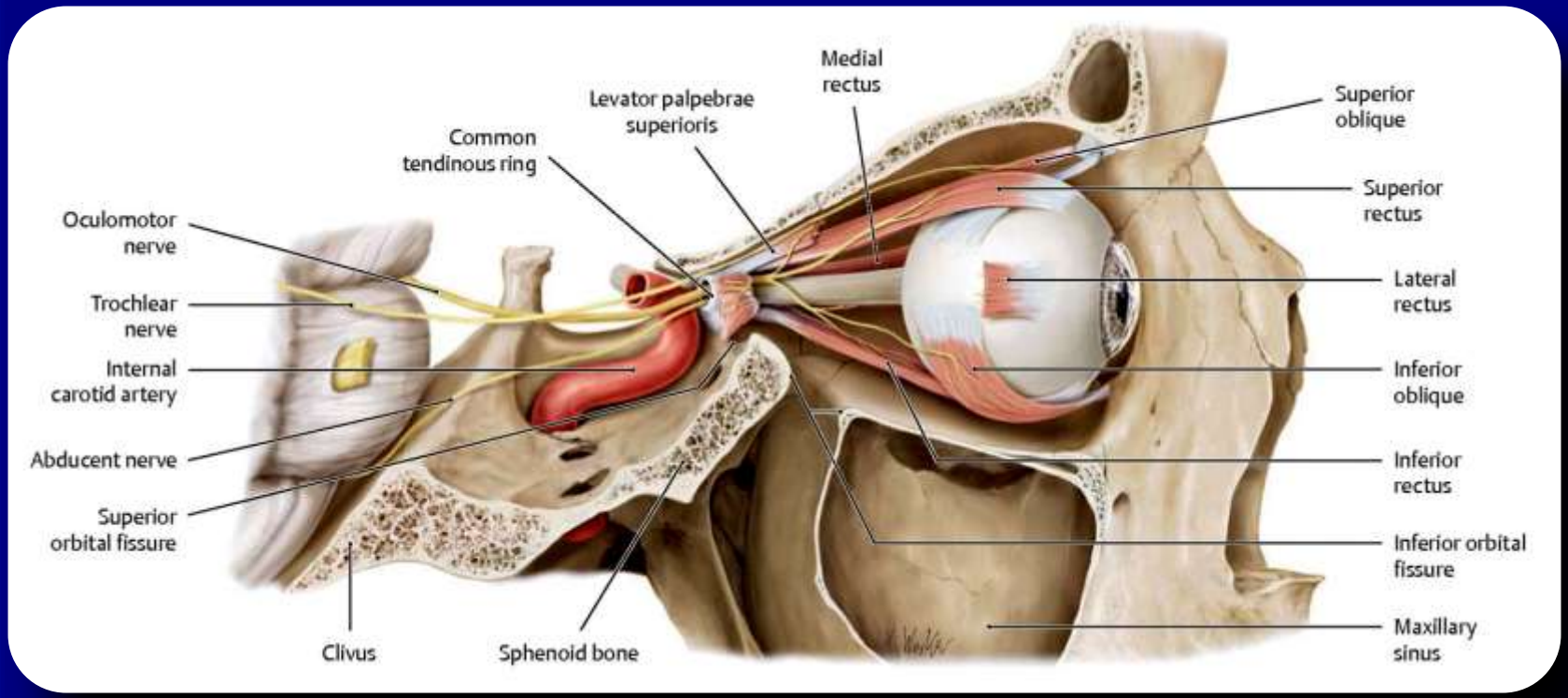
- the condition of the retina
- the blood vessels (particularly the central retinal artery)
- the optic disk (where the optic nerve emerges from the eyeball)
- the macula lutea and fovea centralis

Location of the extraocular muscles

(extrinsic eye muscles)

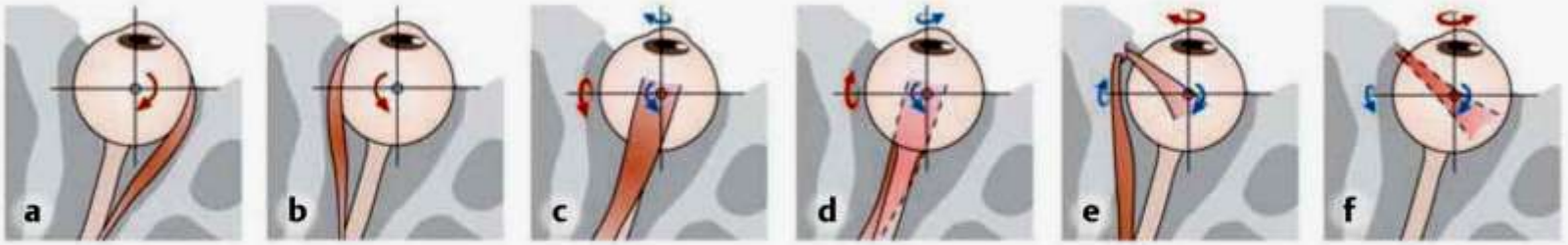






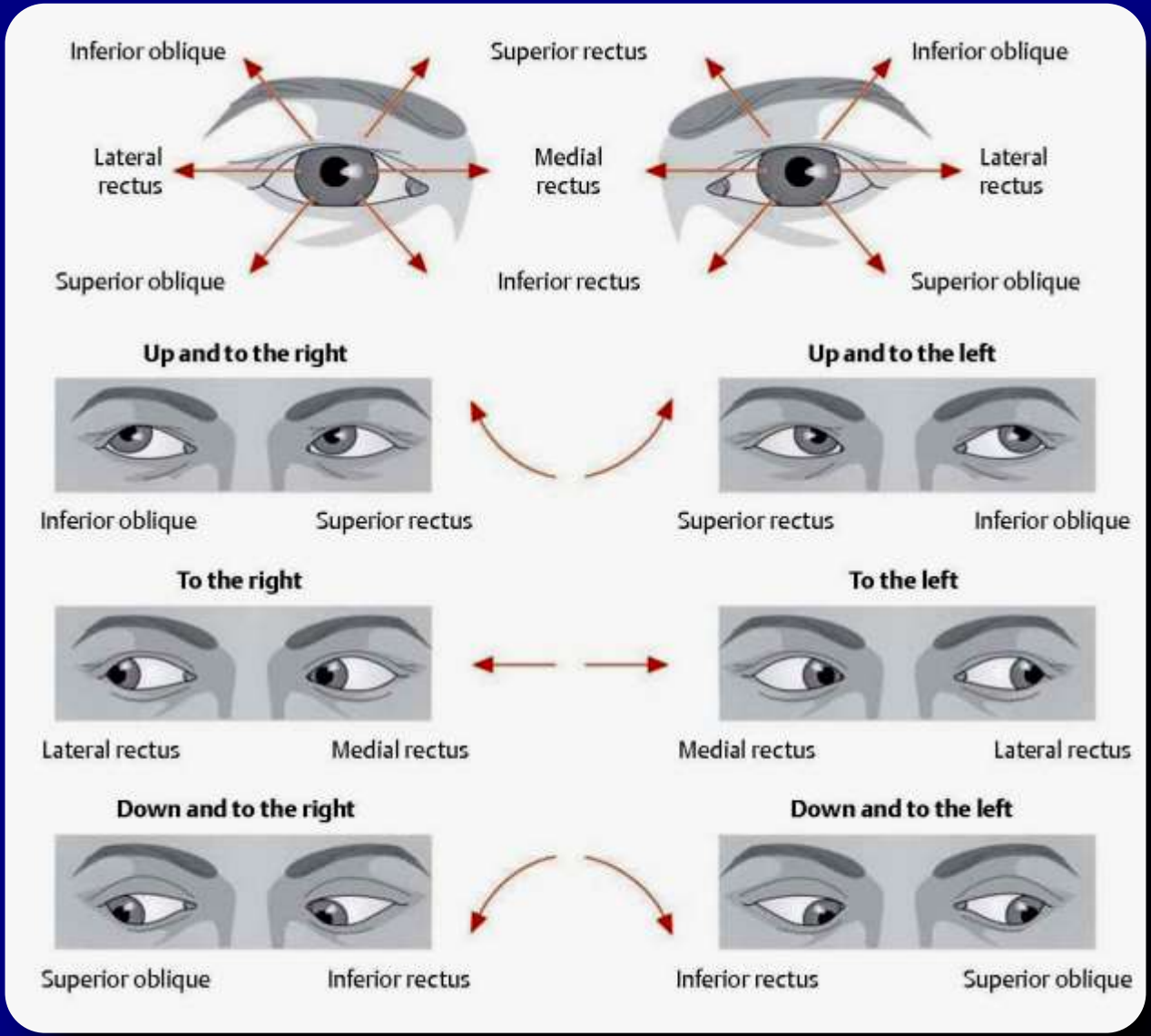
Innervation of the extraocular muscles

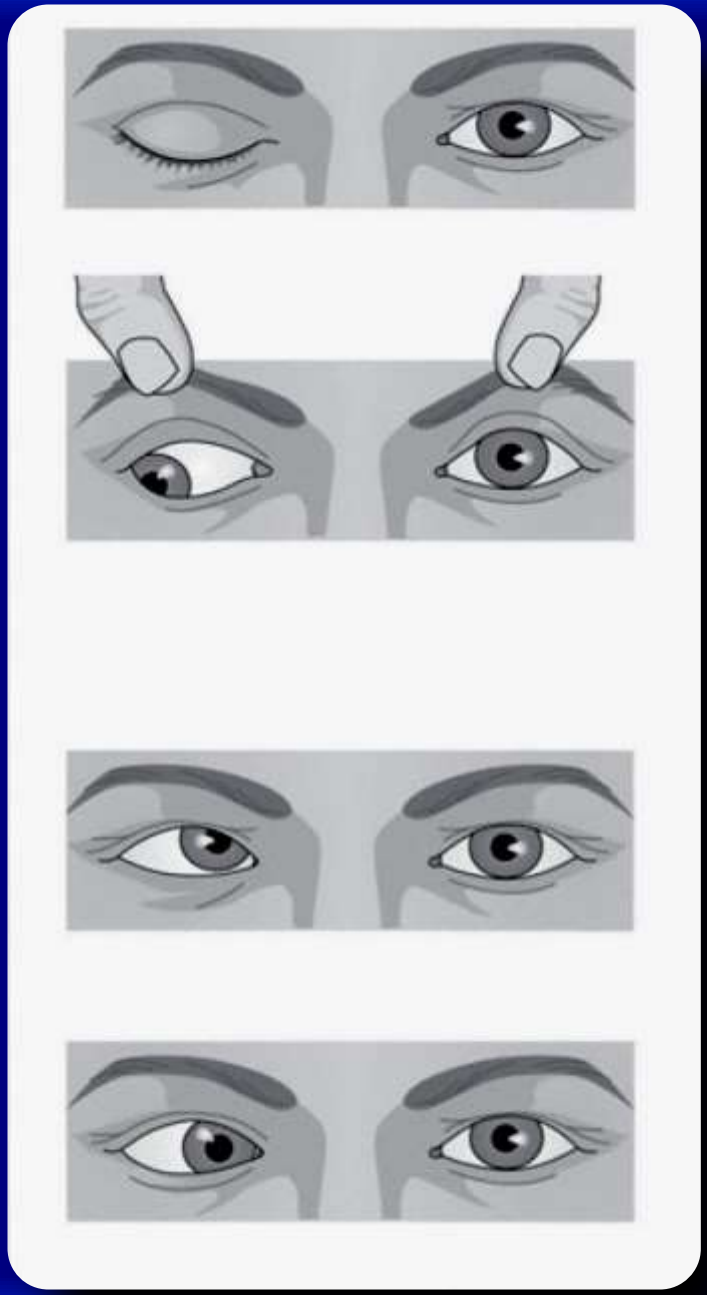
Function and innervation of the extraocular muscles



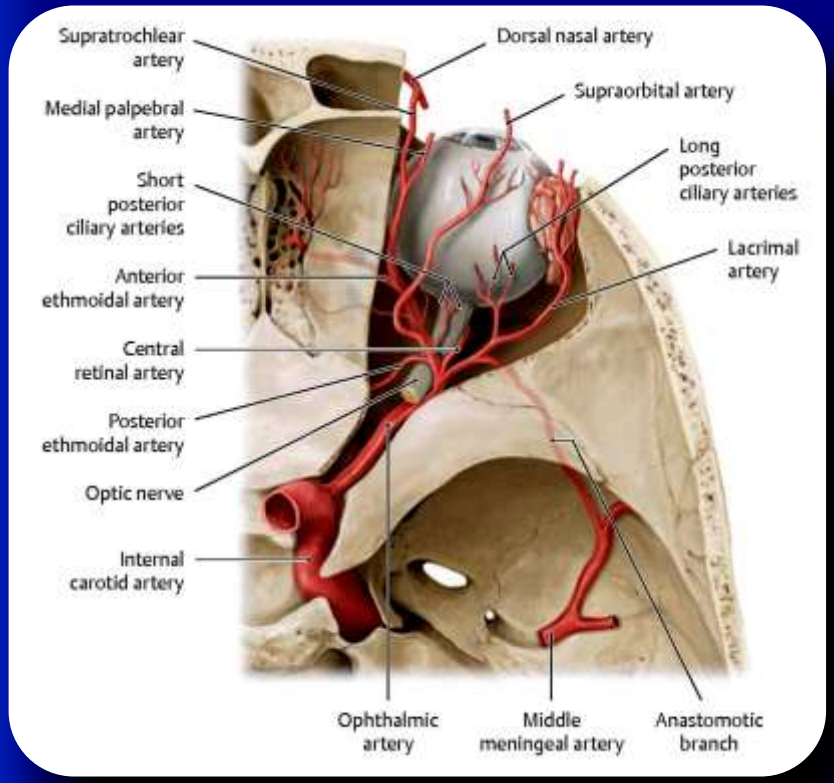
	Muscle	Primary action	Secondary action	Innervation
a	Lateral rectus	Abduction	None	Abducent nerve (CN VI)
b	Medial rectus	Adduction	None	Oculomotor nerve (CN III), inferior branch
c	Superior rectus	Elevation	Adduction and medial rotation	Oculomotor nerve (CN III), superior branch
d	Inferior rectus	Depression	Adduction and lateral rotation	Oculomotor nerve (CN III), inferior branch
e	Superior oblique	Depression and abduction	Medial rotation	Trochlear nerve (CN IV)
f	Inferior oblique	Elevation and abduction	Lateral rotation	Oculomotor nerve (CN III), inferior branch

The six cardinal directions of gaze

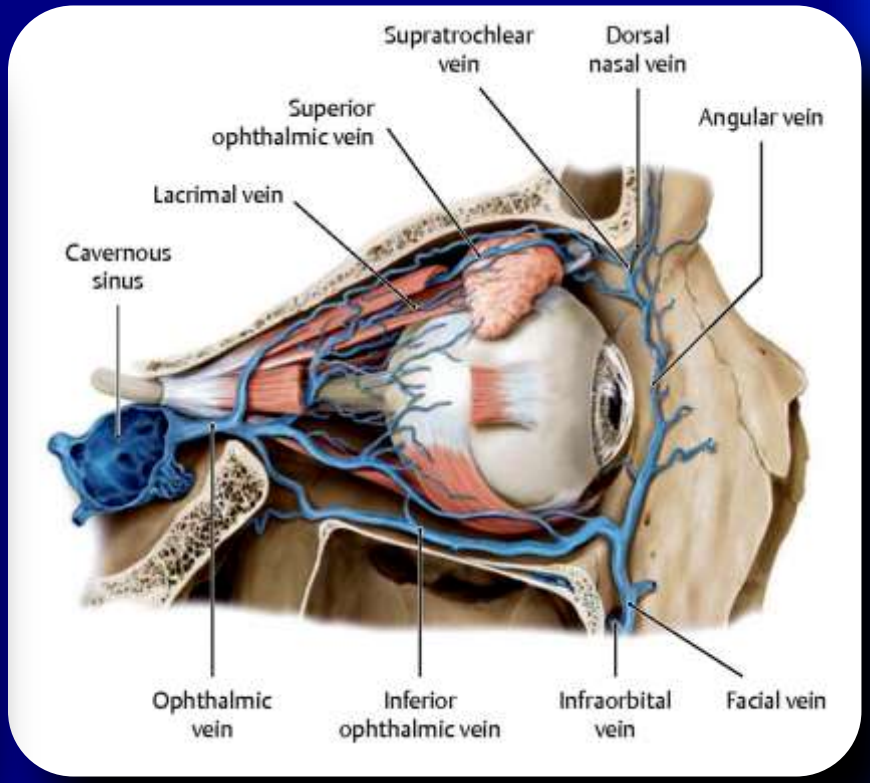




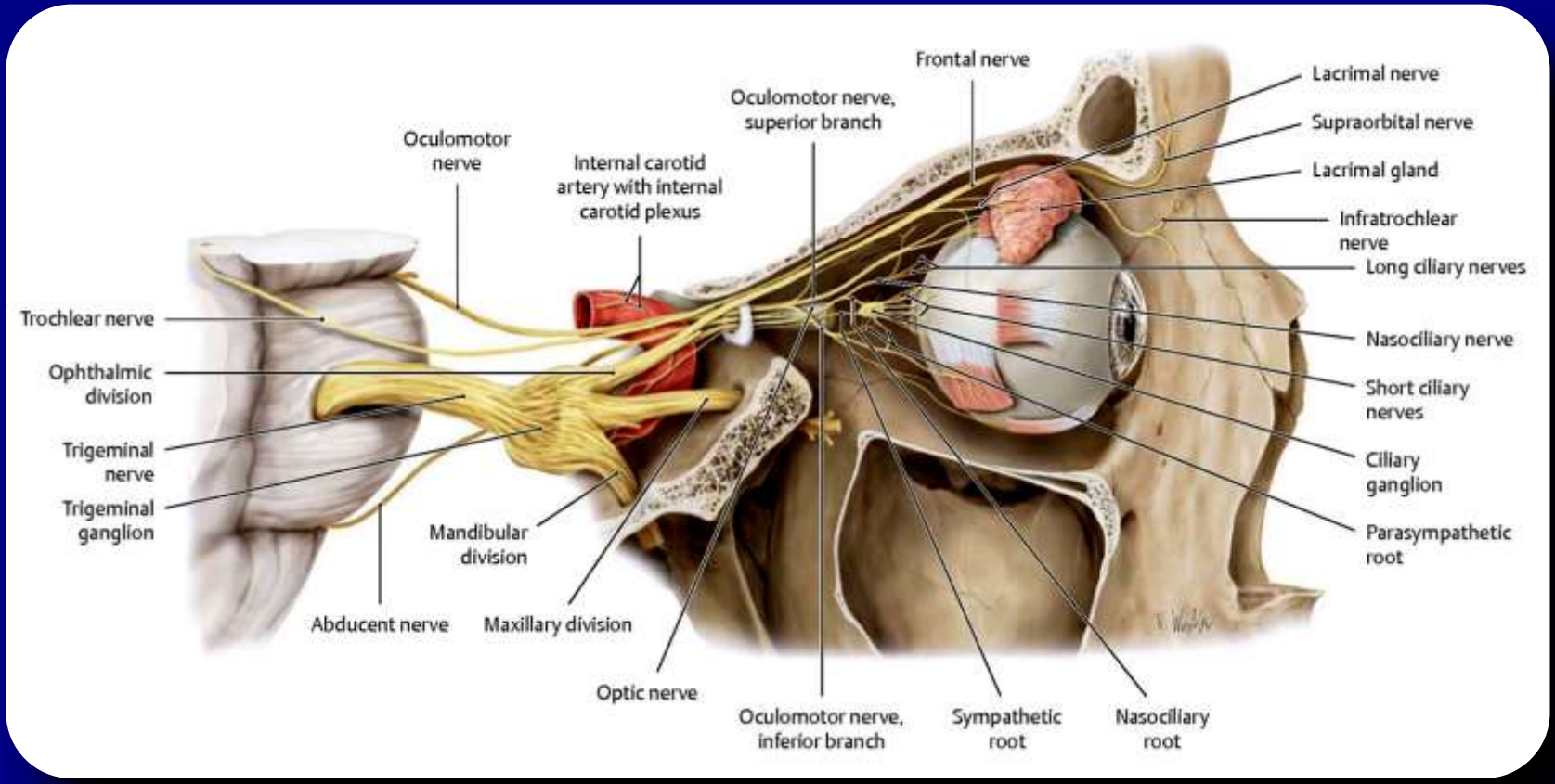
Oculomotor palsies



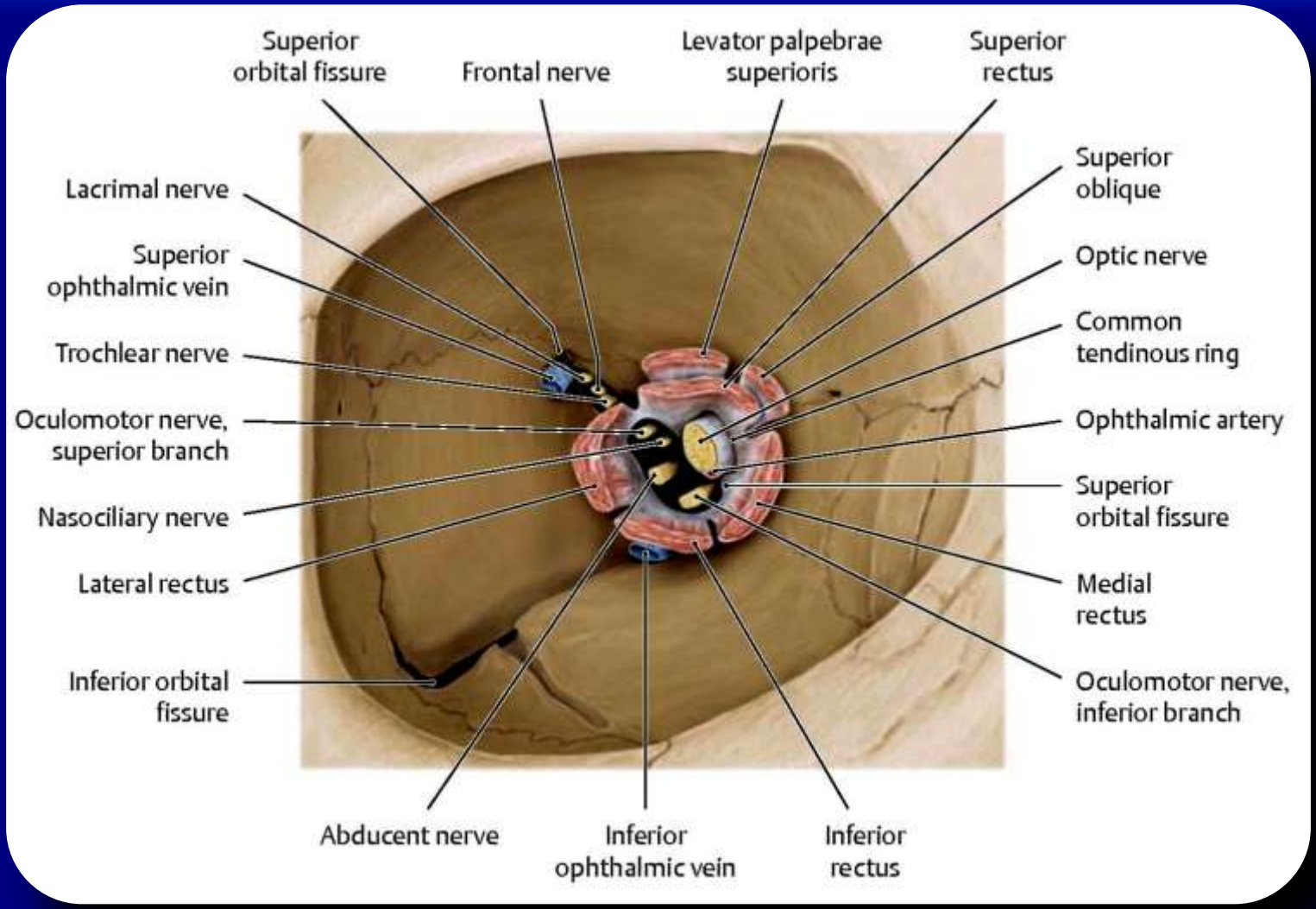
Branches of ophthalmic artery



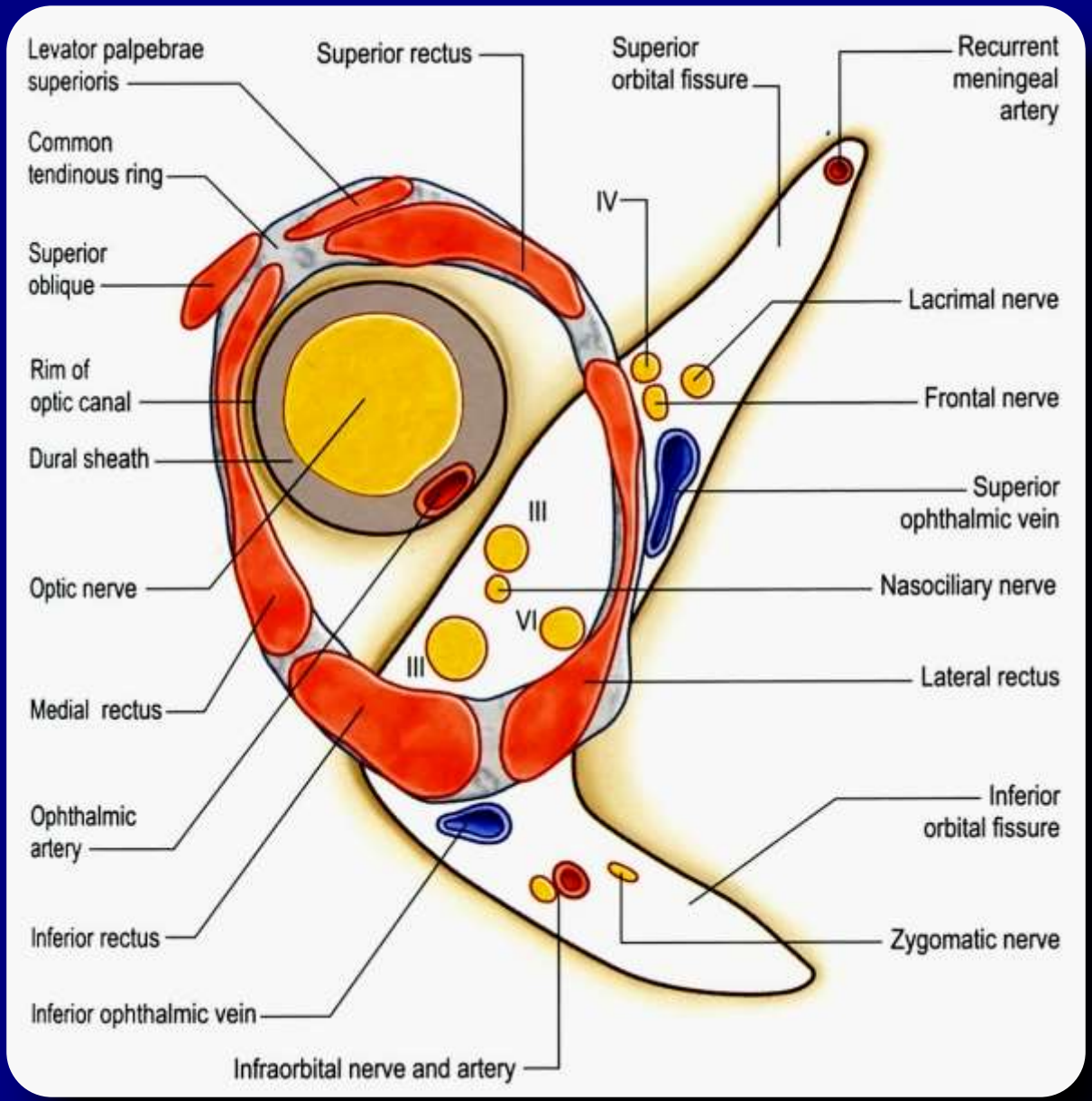
Veins of the orbit



Innervation of the orbit



Posterior wall of the orbit: common tendinous ring and sites of passage of neurovascular structures through the optic canal and superior orbital fissure


Levator palpebrae superioris
Superior rectus
Superior orbital fissure
Recurrent meningeal artery
Common tendinous ring
IV
Superior oblique
Lacrimal nerve
Rim of optic canal
Frontal nerve
Dural sheath
Superior ophthalmic vein
III
Optic nerve
Nasociliary nerve
VI
III
Lateral rectus
Medial rectus
Inferior orbital fissure
Ophthalmic artery
Inferior rectus
Zygomatic nerve
Inferior ophthalmic vein
Infraorbital nerve and artery

Thank you very much