ANATOMY OF
Orbital cavity

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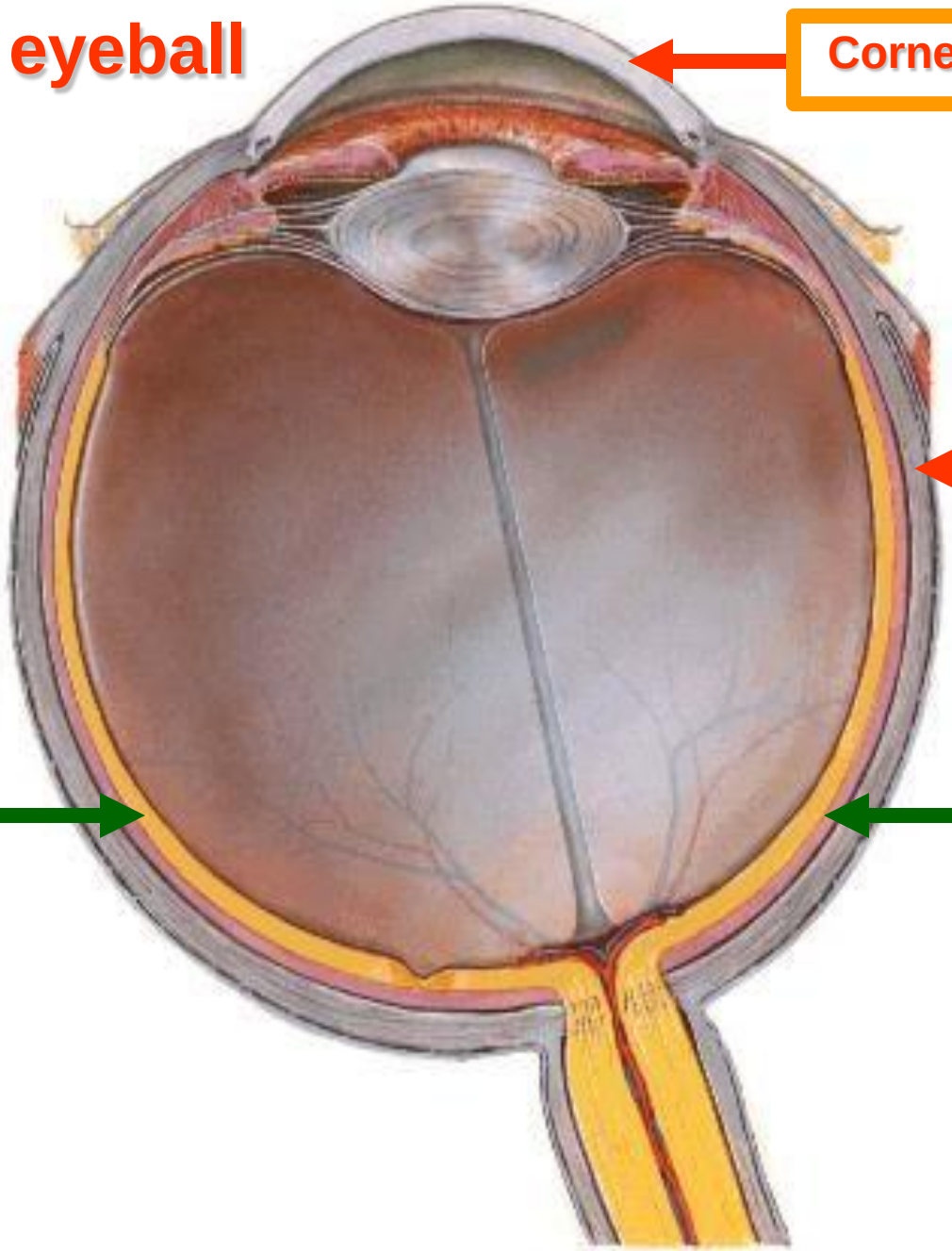
Layers of eyeball



Cornea

Sclera

(1) Outer Fibrous coat

(2) Middle Vascular coat

(3) Inner Nervous Coat (retina)

Horizontal section

OCULAR MUSCLES

10 muscles

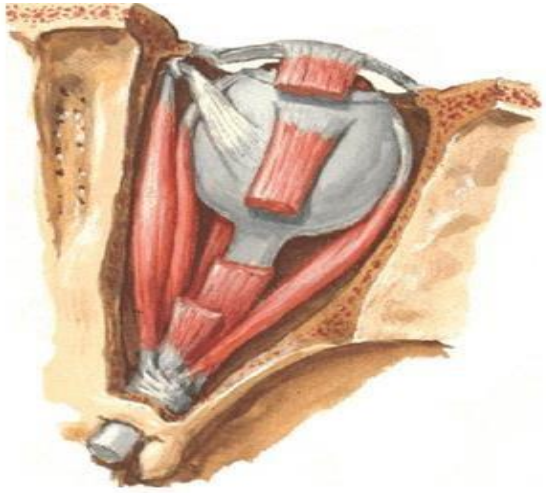
7 extra-ocular

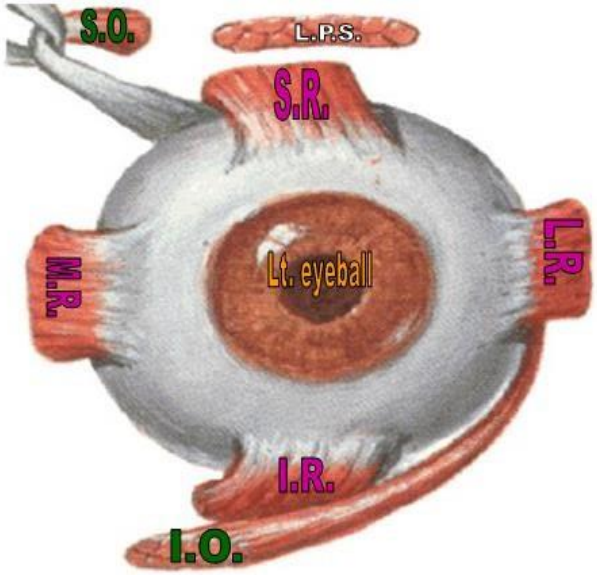
1. levator palpebrea superioris
2. Two oblique muscles:-
   - 1-Superior oblique.
   - 2-Inferior oblique.
3. Four recti muscles:-
   - 1-superior.
   - 2-inferior.
   - 3-medial.
   - 4-lateral.

Palpebrea = الجفن
Recti = مستقيم

3 intra-ocular

1. Sympathetic
   1. dilator pupillea.
   2. ciliary muscles for far vision
2. parasympathetic
   1. constrictor Pupillea.
   2. Ciliary muscles for near vision..





Levator palpebrae superioris

Origin: arises from the roof of the orbit just infront of the optic canal.

Insertion:

- The skin of the upper eyelid.
- The tarsal plate of the upper eyelid.
- The upper fornix of the conjunctiva.

Nerve supply:

- occulomotor nerve = 3rd cranial N (voluntary).

(superior division).

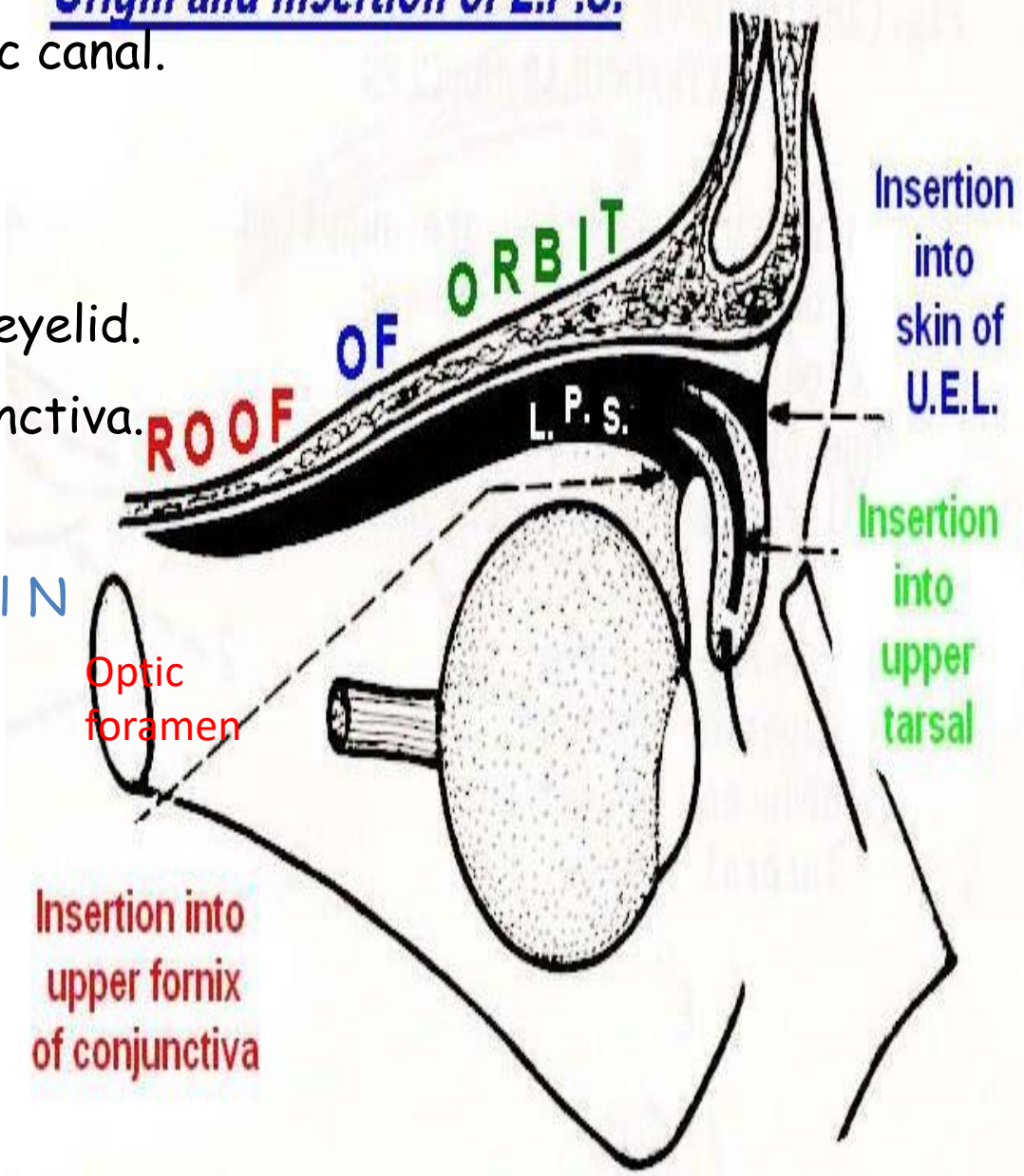
- The superior cervical

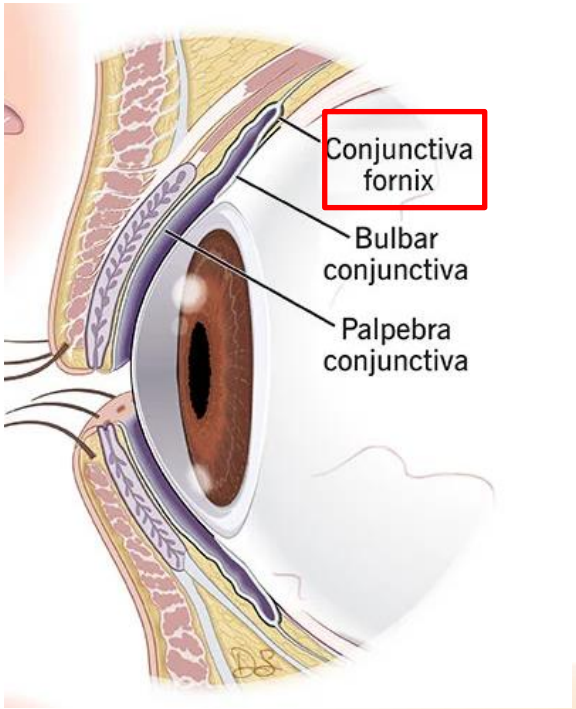
sympathetic ganglion

(sympathetic fibers).Involuntary

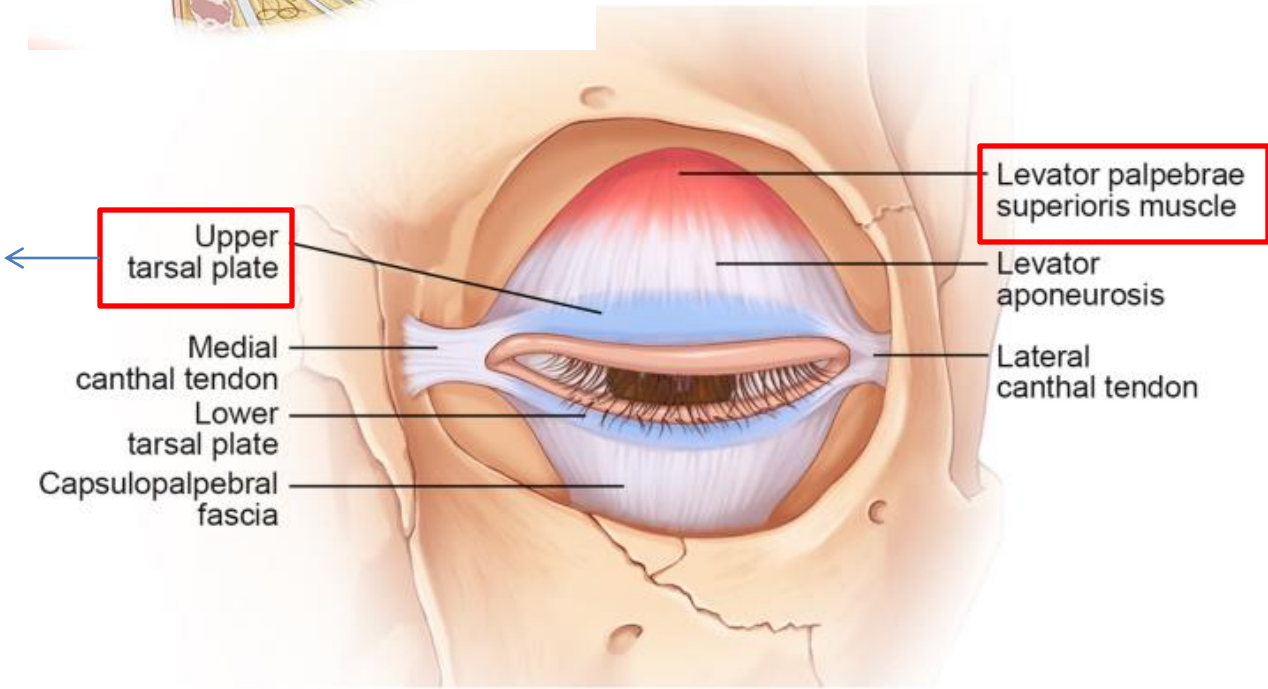
Action:

It elevates the upper eyelid

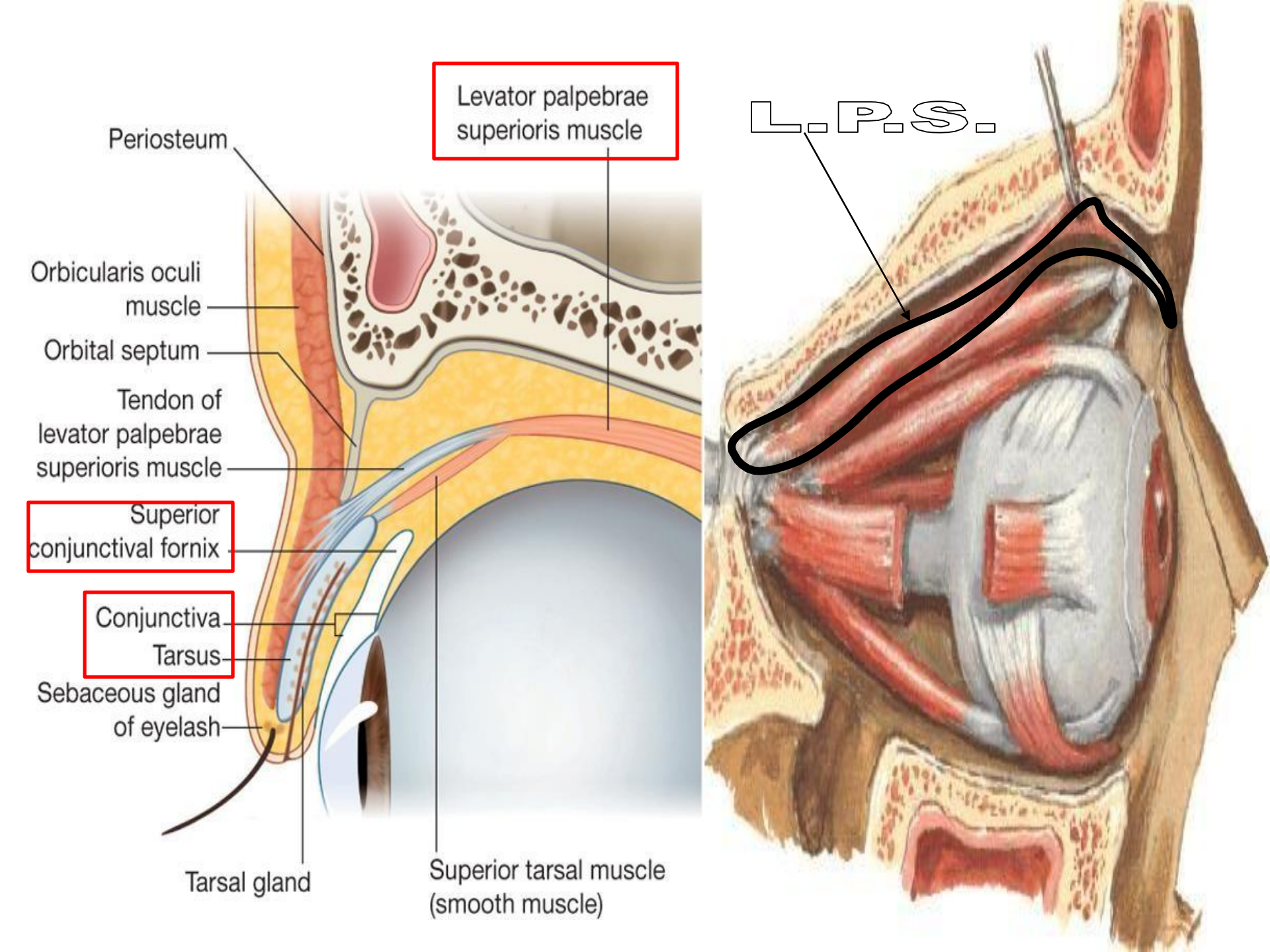




Fibrous plate that forms the skeleton of the upper eyelid



occulomotor → 3rd cranial N
Trochlear → 4th cranial N
Abducent → 6th Cranial N


Levator palpebrae superioris muscle
Periosteum
Orbicularis oculi muscle
Orbital septum
Tendon of levator palpebrae superioris muscle
Superior conjunctival fornix
Conjunctiva
Tarsus
Sebaceous gland of eyelash
Tarsal gland
Superior tarsal muscle (smooth muscle)
L.P.S.

4 Recti muscles

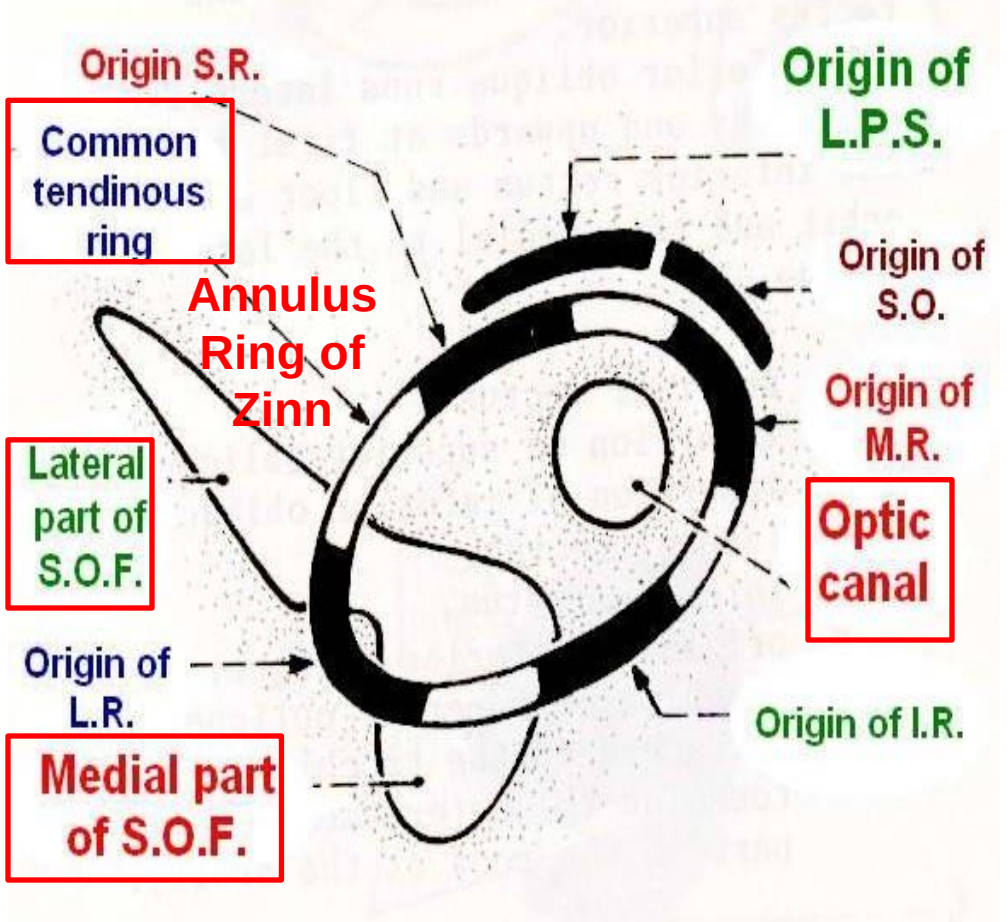
Origin:

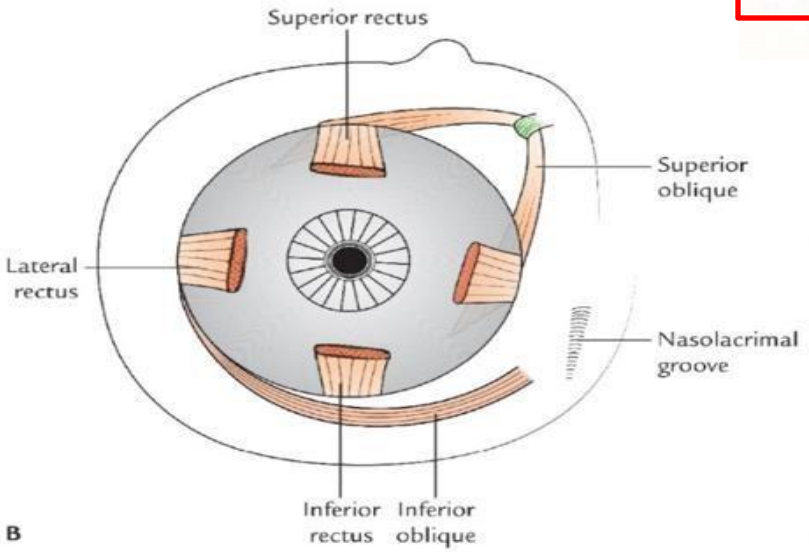
- The 4 recti muscles arise from a common tendinous ring (next slide).
- This ring surrounds the optic canal and the medial part of the superior orbital fissure.

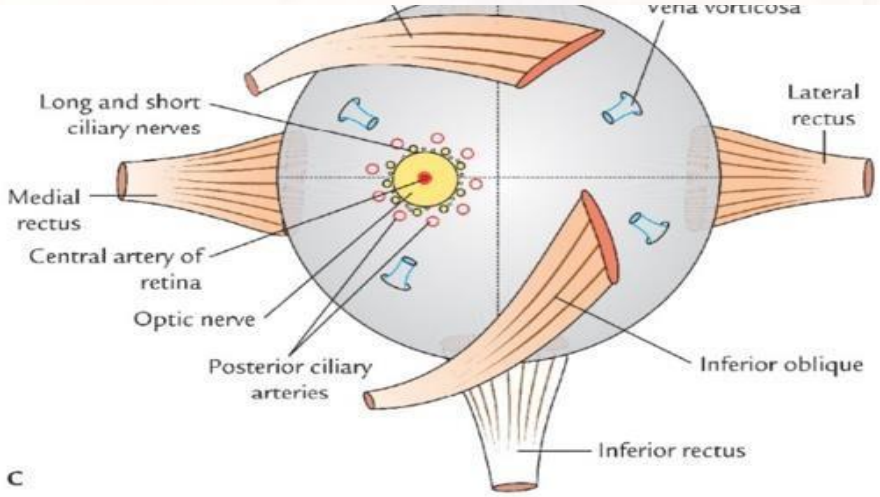
Insertion:

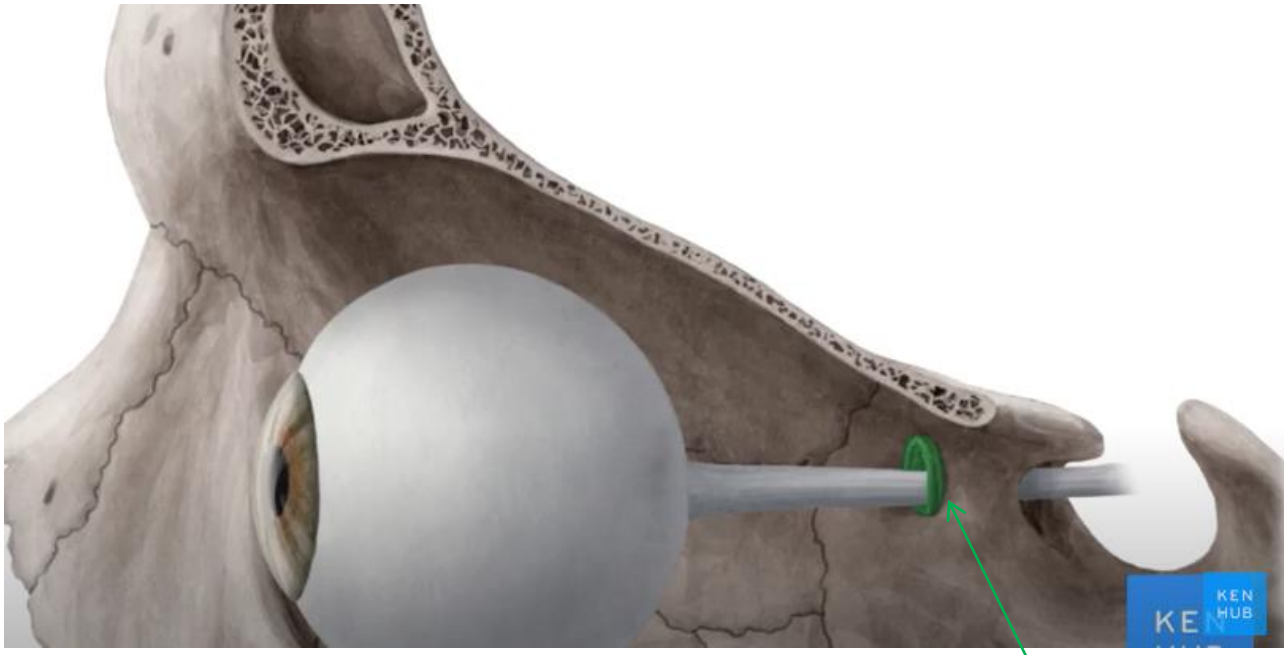
- The tendon of each muscle inserted into the sclera (الصلبة العينية) infront of the equator of the eyeball (about 5-7 mm behind the corneoscleral junction).

→ slide 10.



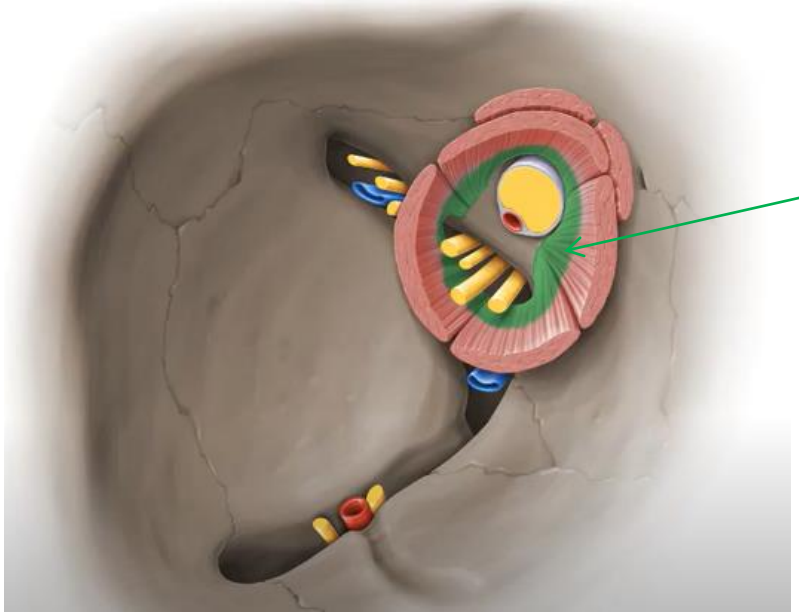




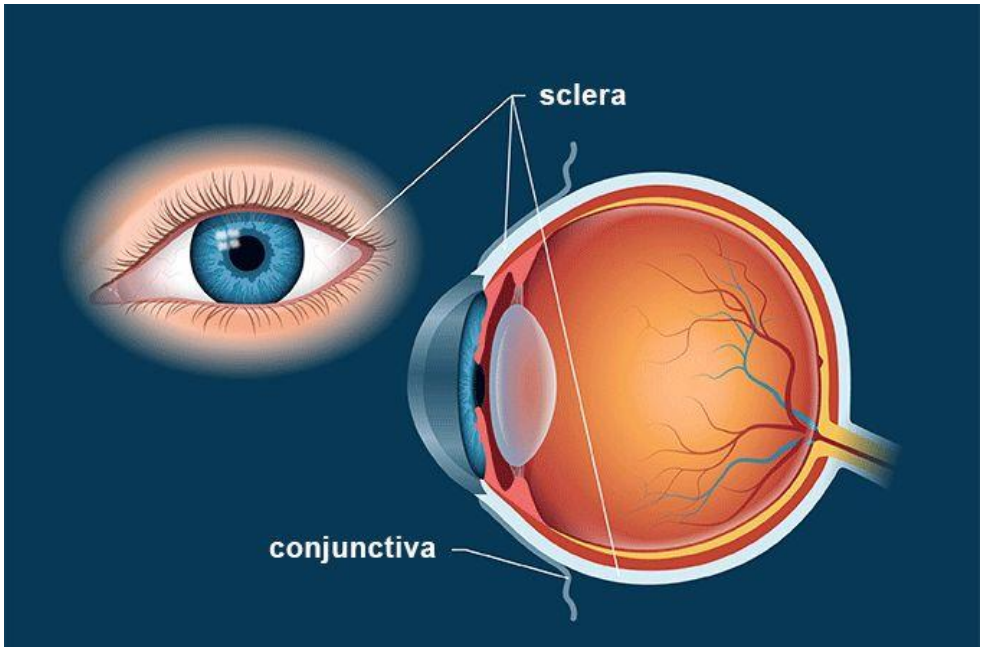


common tendinous ring is also called = **Annulus Ring of Zinn.**

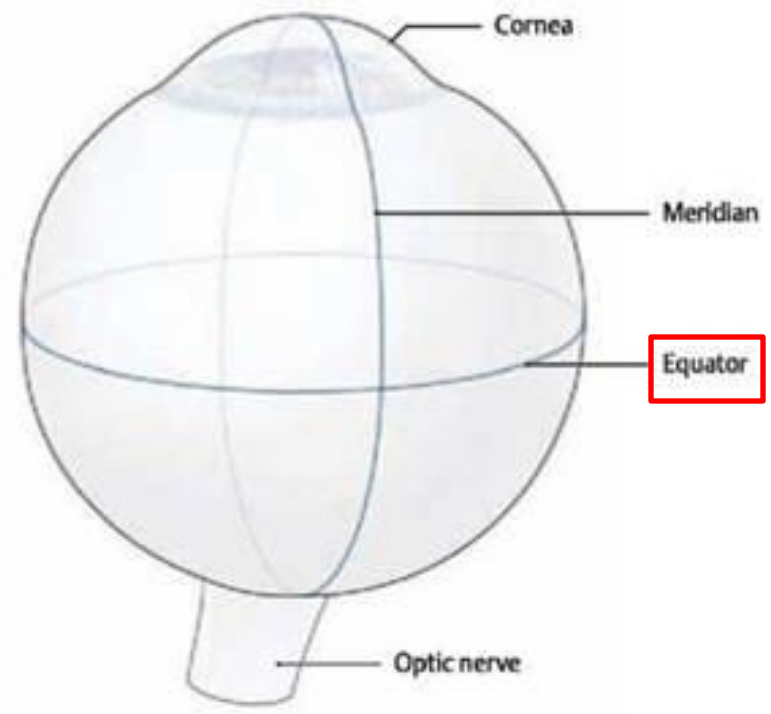
Lateral

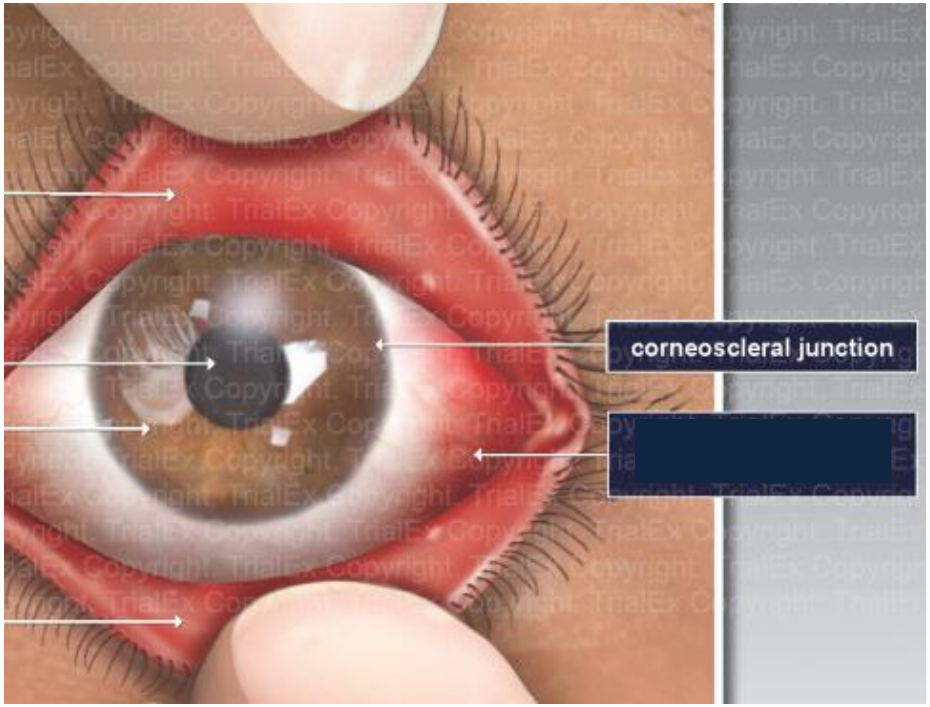


Medial



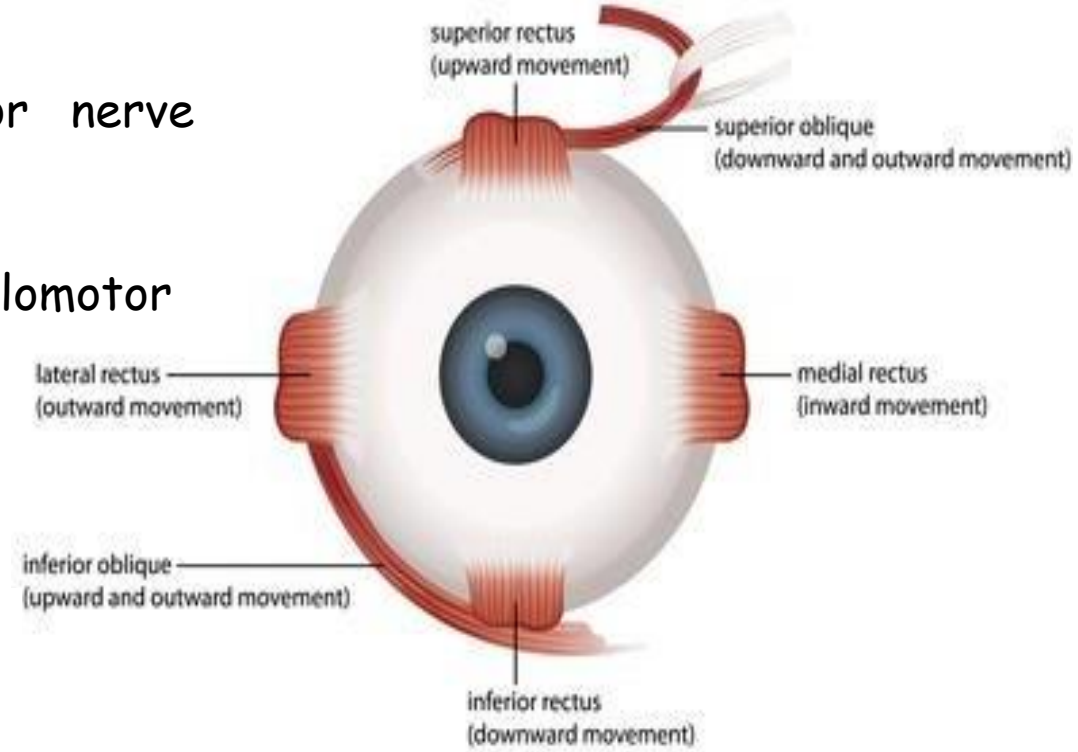
The point of insertion for these muscles is important for squint correction surgeries.

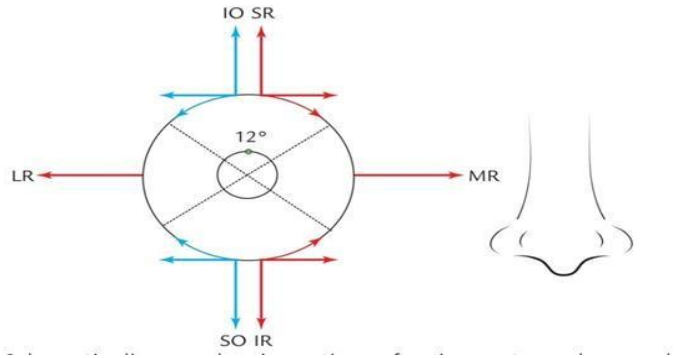




Nerve supply:

- Superior rectus → occulomotor nerve (superior division).
- Inferior and medial rectus →occulomotor nerve (inferior division).
- Lateral rectus → abducent nerve.

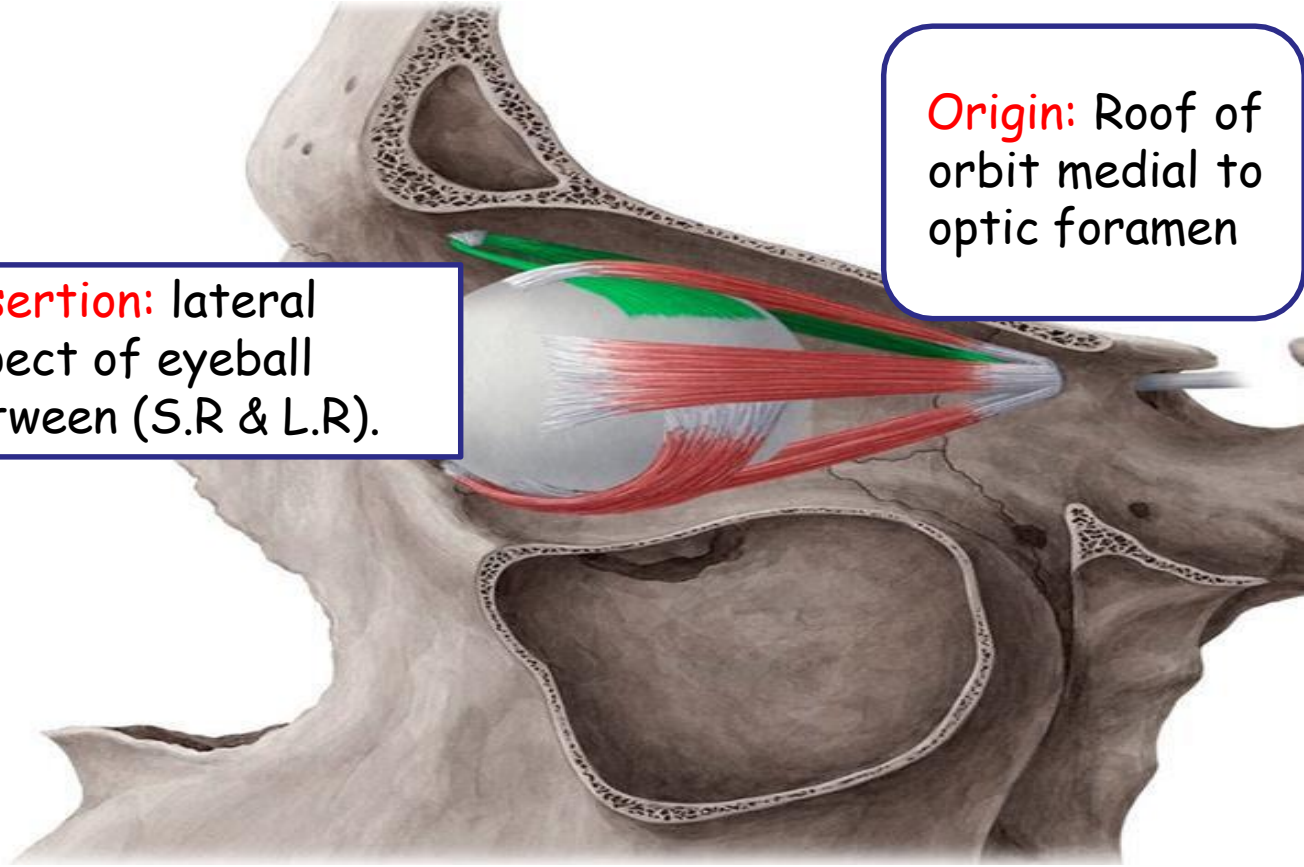




Actions: Click here

- Superior Rectus: **elevation**, adduction&Rotate eyeball medially (Intorsion).
- Inferior Rectus: **depression**, adduction&Rotate eyeball medially (Extorsion)
- Medial Rectus: ***Add***uction of the eyeball.
- Lateral Rectus: ***Abd***uction of the eyeball.

Superior oblique muscle S.O.

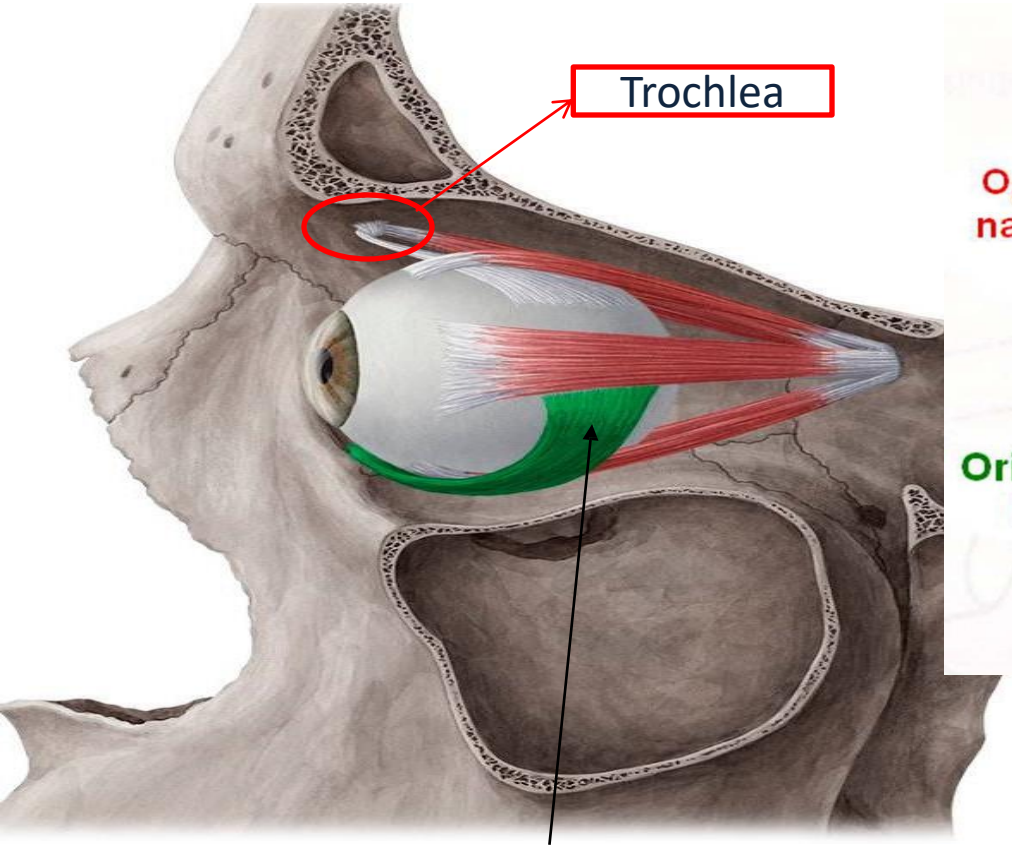


Origin: Roof of orbit medial to optic foramen

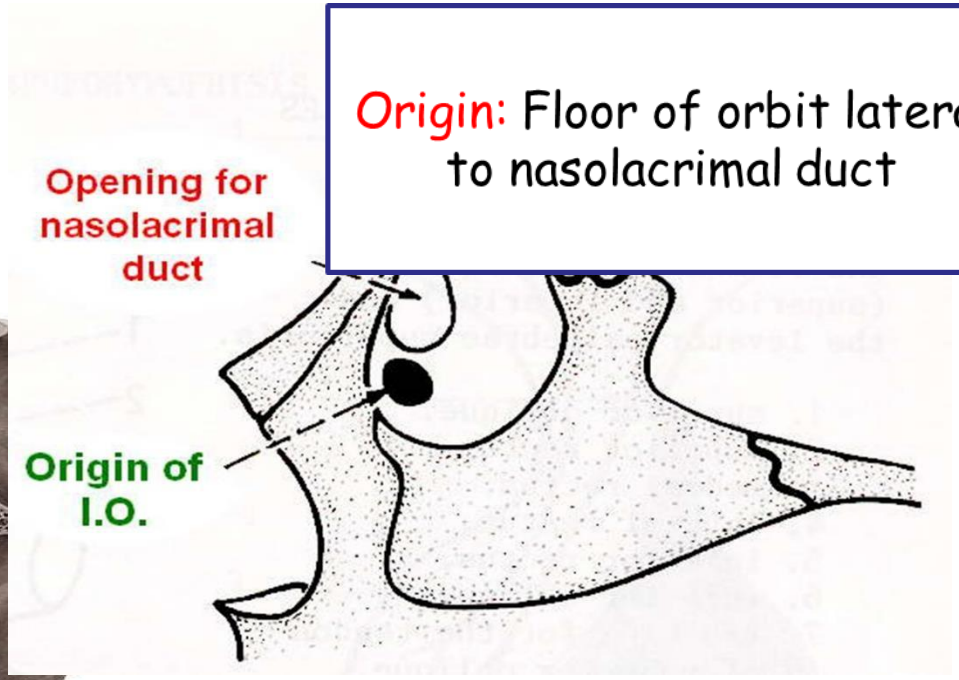
Insertion: lateral aspect of eyeball between (S.R & L.R).

- **Nerve supply**: Trochlear Nerve (S.O.4)
- **Action**: **Depression**, Abduction, & intortion (Lateral rotation).

Inferior oblique muscle I.O



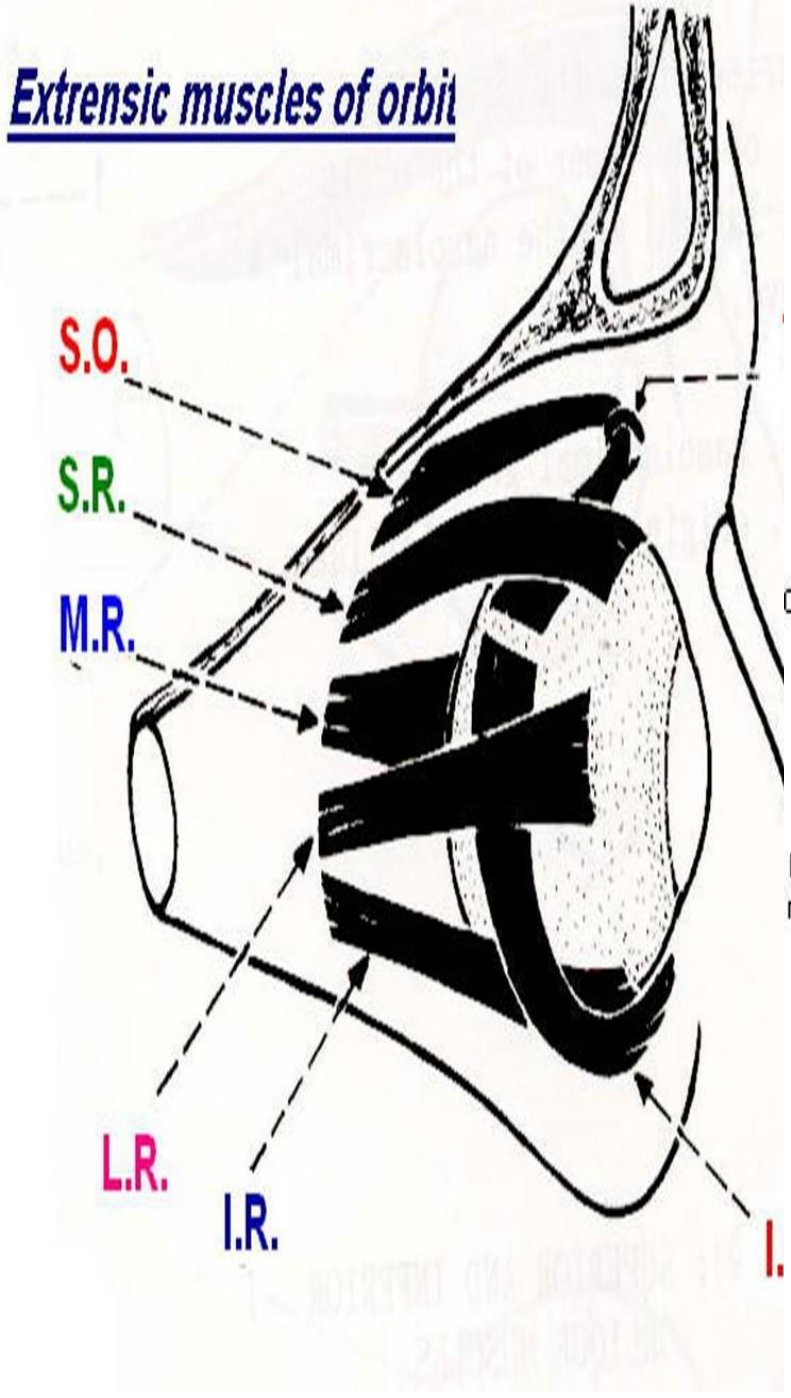
Insertion: lateral aspect of sclera (close to insertion of S.O).



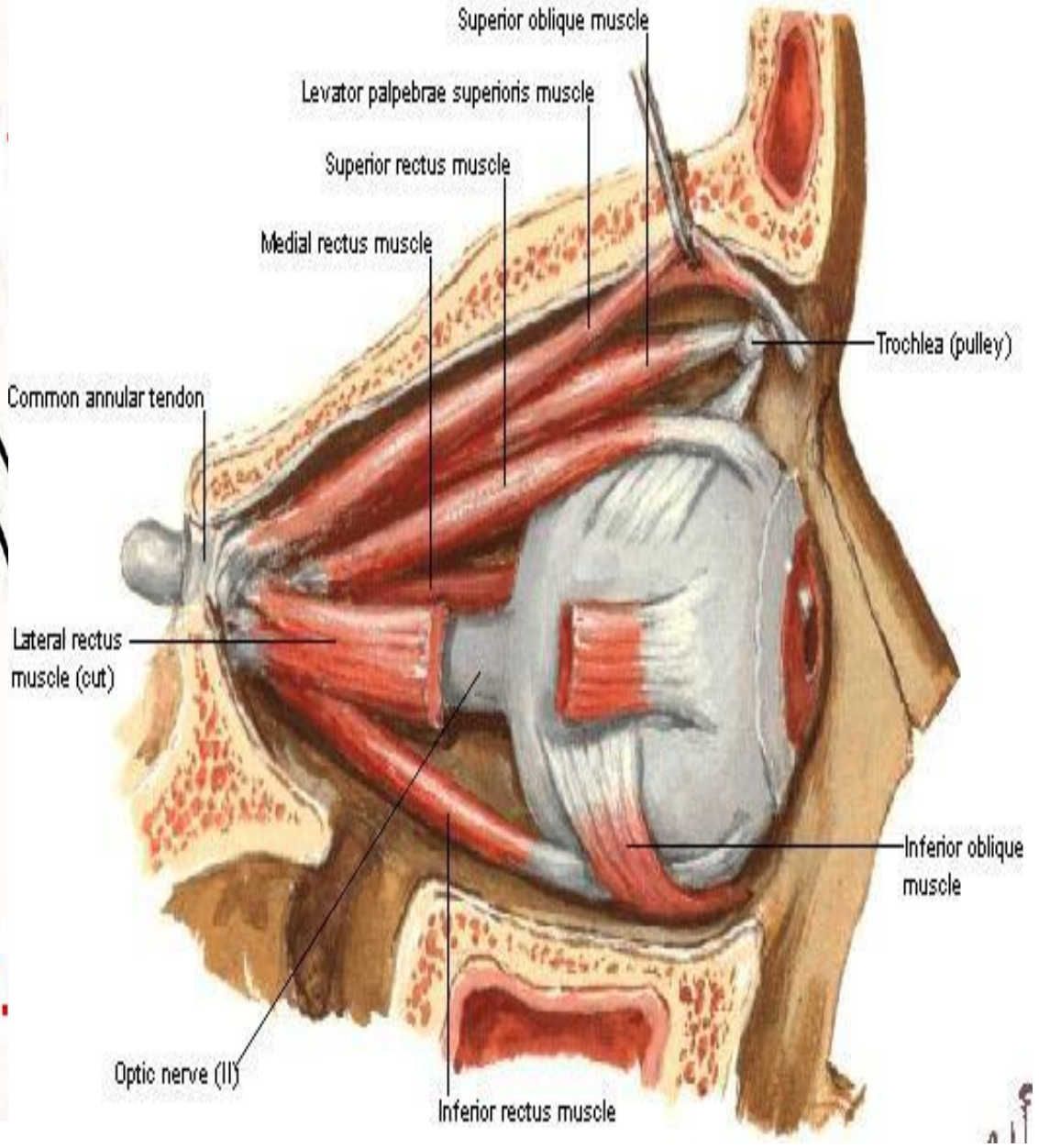
Origin: Floor of orbit lateral to nasolacrimal duct

- **Nerve supply**: Oculomotor Nerve (inferior division).
- **Action**: **Elevation** Abduction & extortion (medial rotation).

Extrensic muscles of orbit



Right Lateral View



Movements of the eyeball (very important in exam)

1 Elevation: Superior rectus – inferior oblique.

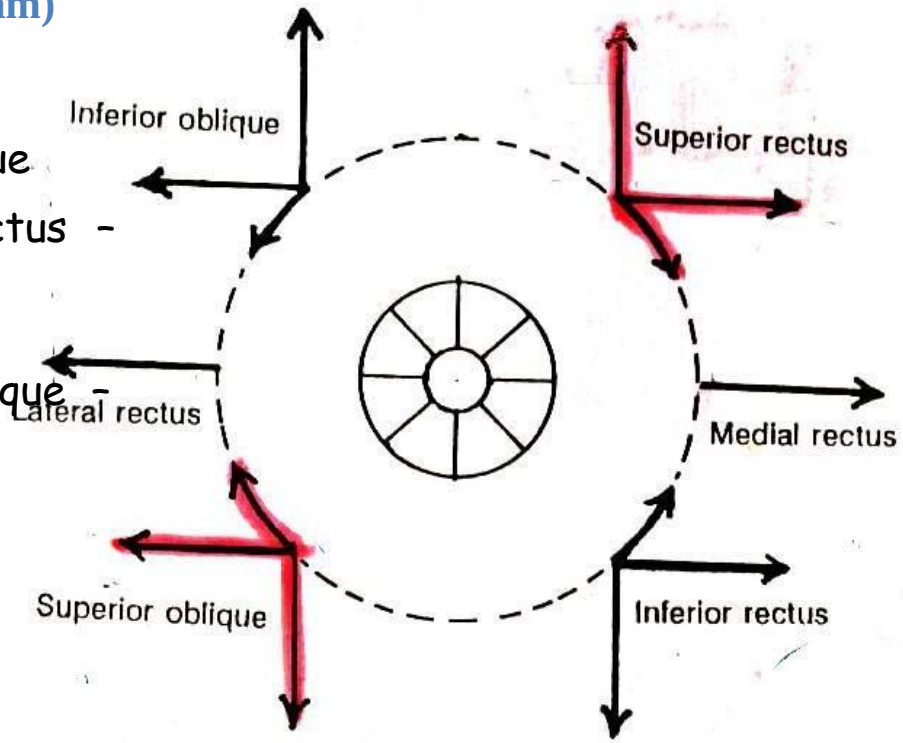
2 Depression: Inferior rectus – superior oblique

3 Adduction: Superior rectus - medial rectus - inferior rectus

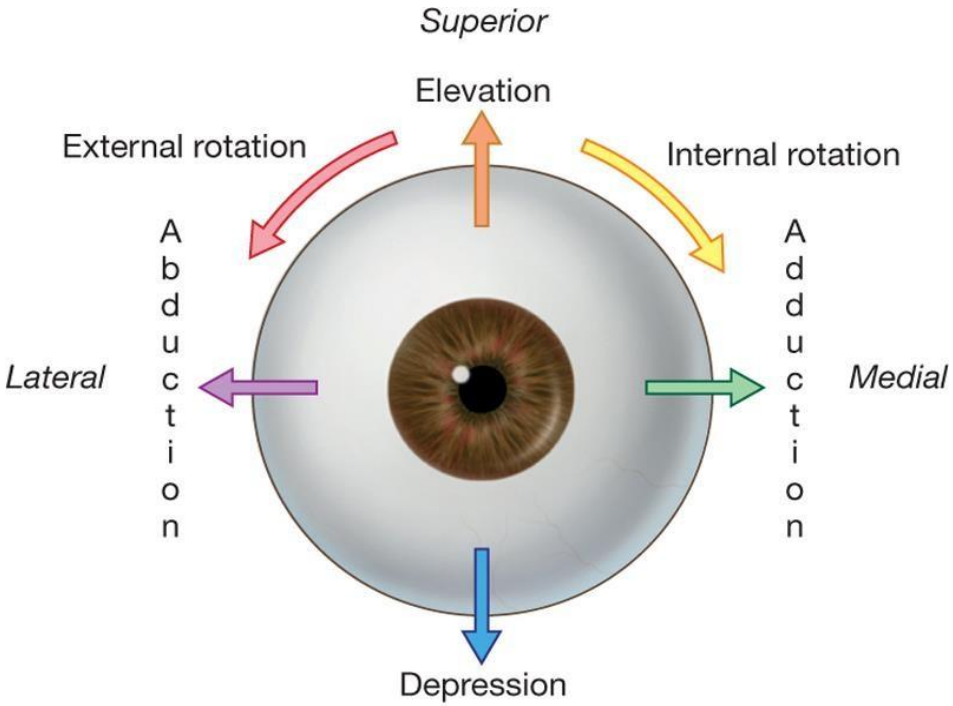
4 Abduction: Lateral rectus - superior oblique - inferior oblique

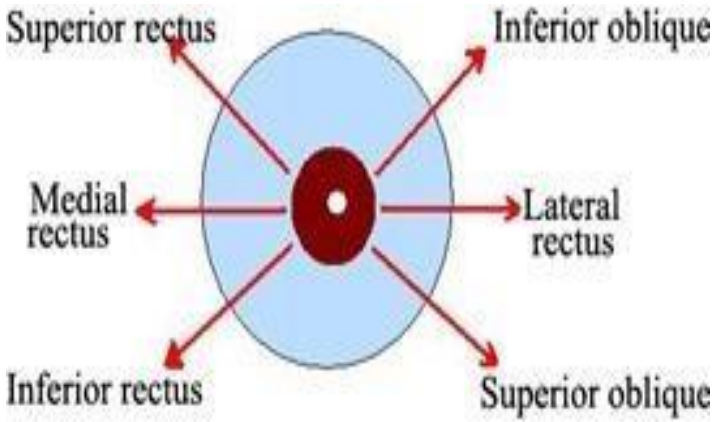
5 Intorsion: Superior rectus – superior oblique

6- Extorsion: Inferior rectus – inferior oblique



Actions of extaocular muscles





NERVE SUPPLY

1.Oculomotor nerve (3rd) :

a) Superior division:

1.L.P.S. (levator Palpebrea superiors).

2.S.R. (superior rectus)

b) Inferior division:

1.I.R. (inferior rectus)

2.I.O. (inferior oblique)

3.M.R. (medial rectus)

Occulomotor N has 2 divisions :
1- superior division.
2- inferior division.

2.Trochlear nerve (4th) : S.O. (So4) Superior oblique

3.Abducent nerve (6th) : L.R. Lateral rectus

Neuro-vascular supply

INNERVATION OF ORBIT

1 =Motor nerves:-

1)-3rd (occulomotor). 2)-4th (trochlear) . 3)-6th (Abducent).

2 =Sensory nerves:-

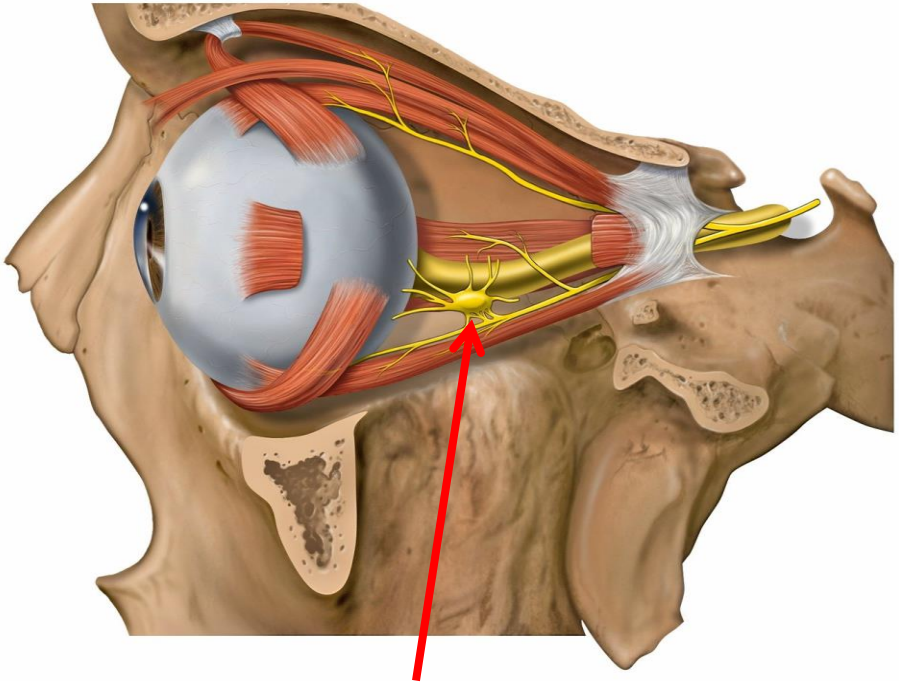
1)-General:- Ophthalmic division of trigeminal nerve (study with trigeminal nerve)

2)-Special [vision]:-2nd Optic nerve for vision.

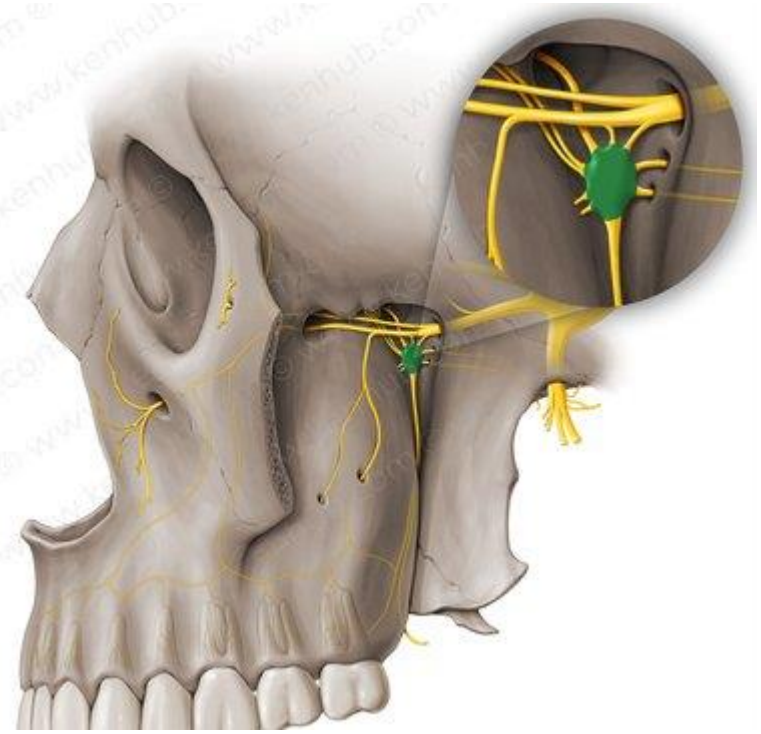
3 =Para-sympathetic ganglion [autonomic nerve]:-

1- ciliary ganglion : **sphincter & ciliary muscles**

2- S.P.G. = SphenoPalatine Ganglion = pterygopalatine ganglion : **lacrimal gland**



ciliary ganglion



SphenoPalatine Ganglion

Optic nerve

(2nd cranial nerve)

Special sensation for vision

- Type: Special sensory nerve (N of vision).
- Origin:

➢ Its fibers are axons of the ganglion cells of the retina شبكية العين (next slide).

➢ Its length is 40 mm (25 mm intraorbital, 5 mm in the optic canal, and 10 mm intracranial).

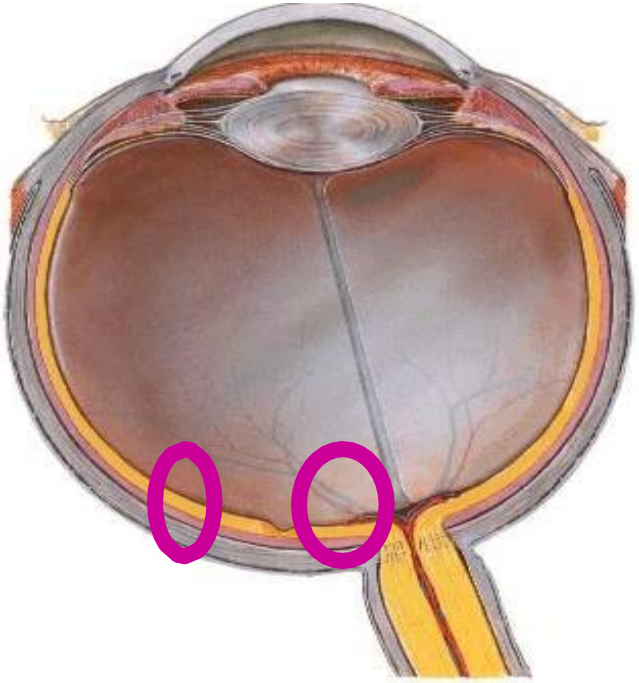
- Course and relation:

➢ Emerges from the eyeball 3 or 4 mm nasal to its centre.

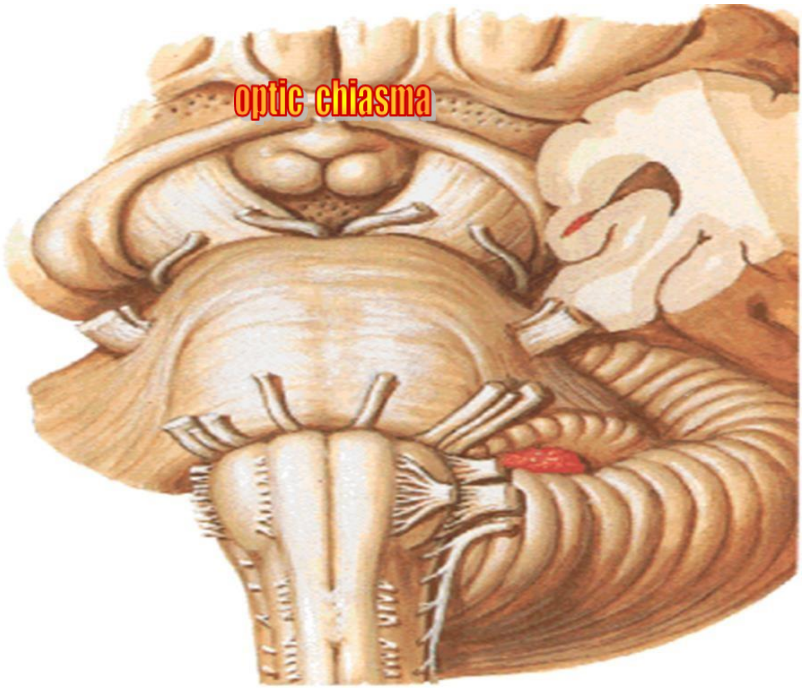
➢ Runs backwards & medially.

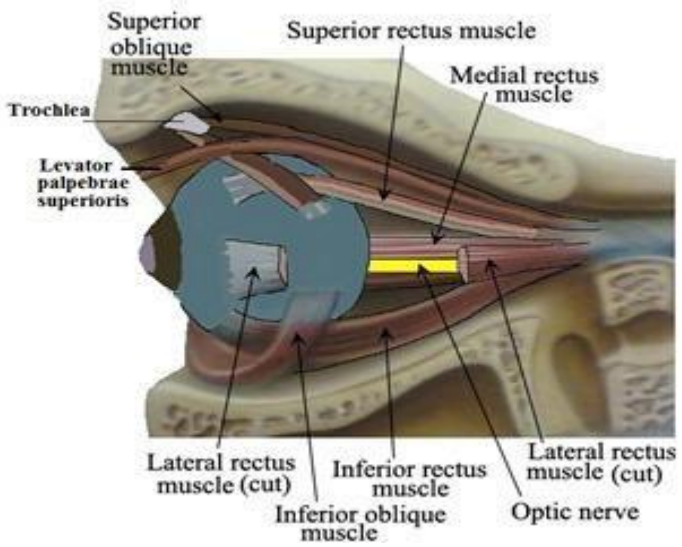
➢ Passes via optic canal to enter the middle cranial fossa.

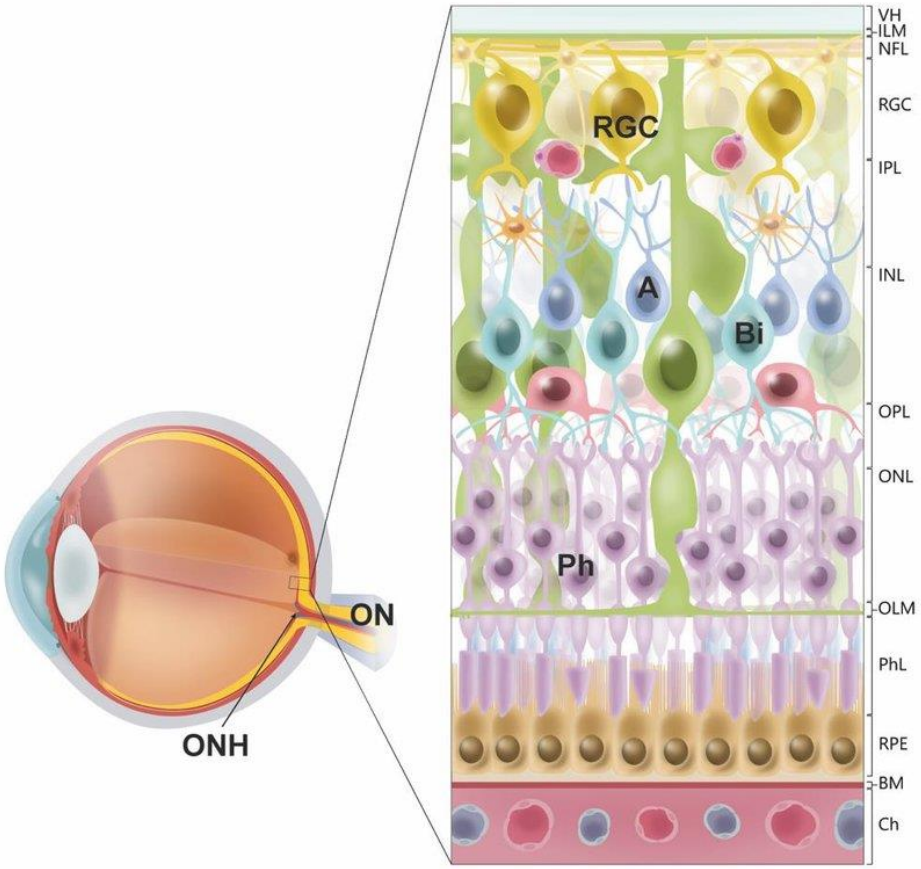
➢ **It joins the nerve of the opposite side to form optic chiasma**.(next slide).

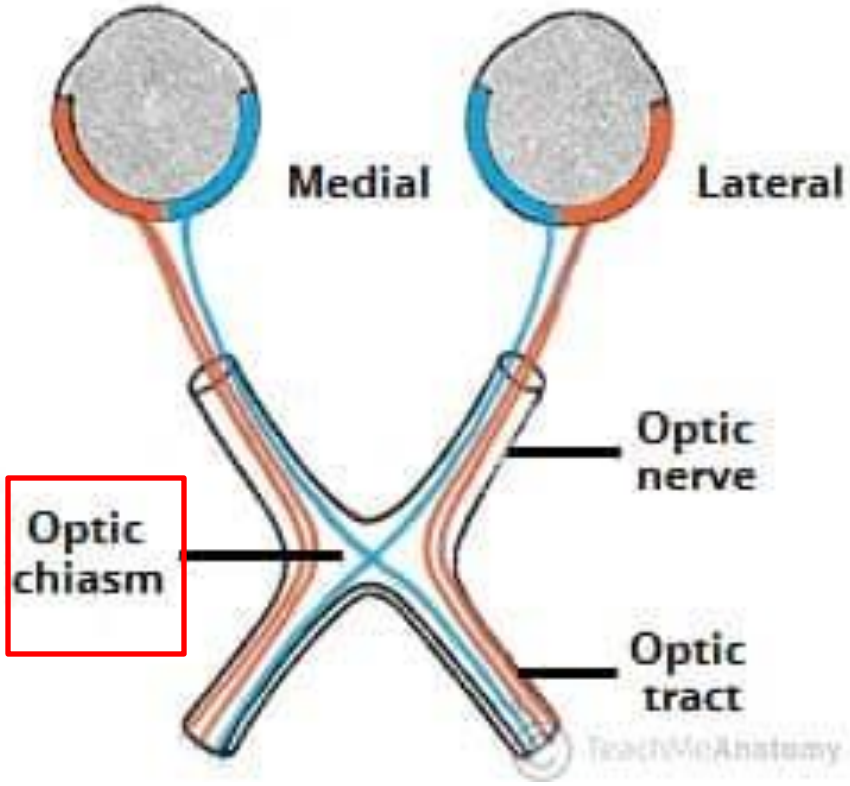


Horizontal section









ganglion cells of the retina

Oculomotor nerve

(3rd cranial nerve)

TYPE: Mixed

ATTACHEMENT:-

=emerges from ANTERIOR aspect of MIDBRAIN .medial to cerebral peduncle In interpeduncular fossa (next slide).

Exit from skull:-

=via lower part of **SUPERIOR ORBITAL FISSURE**

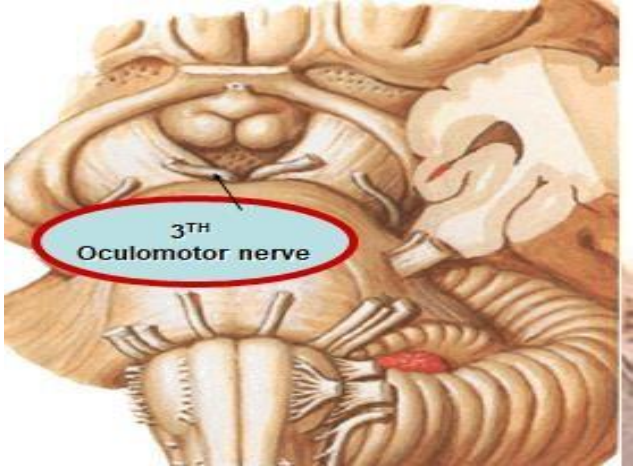
=within tendinous ring.

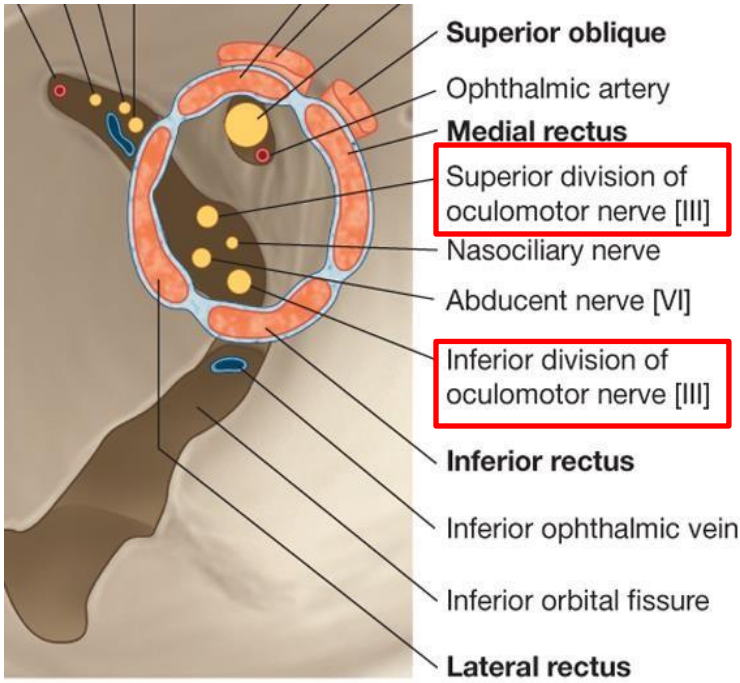
=it divides into superior and inferior divisions

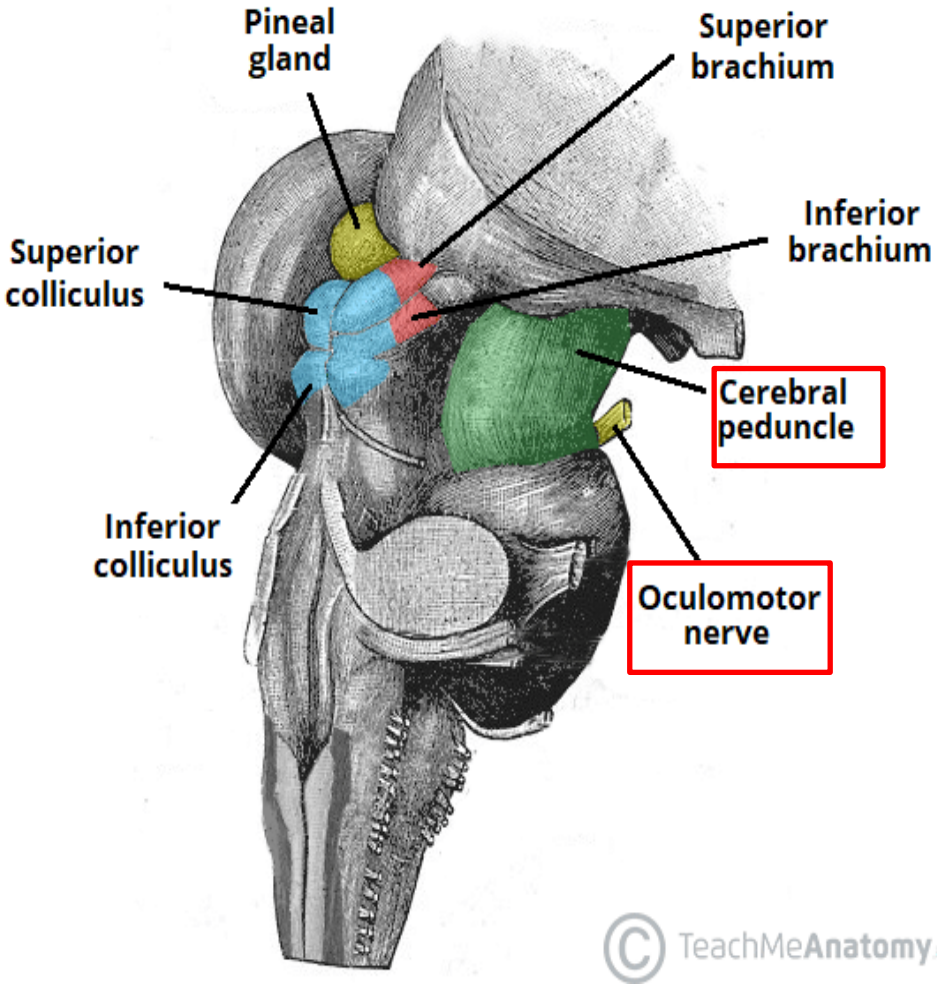
COURSE:-

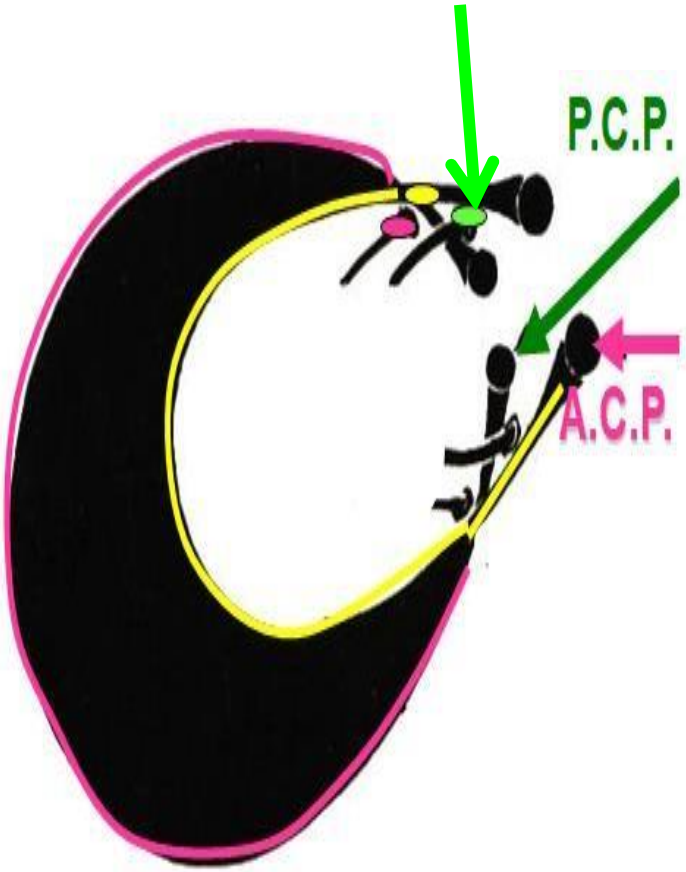
1pierces dura **IN FRONT OF** point of crossing of and attached border of ***tentorium cerebelli***

2 runs forwards in **LATERAL WALL OF CAVERNOUS SINUS=*ABOVE TROCHLEAR N.***






Pineal gland
Superior brachium
Inferior brachium
Superior colliculus
Cerebral peduncle
Inferior colliculus
Oculomotor nerve
© TeachMeAnatomy.info


P.C.P.
A.C.P.

5 Branches & distribution:-

ALL EXTRENSIC AND INTRINSIC MUSCLE OF EYE **EXCEPT**

1 superior oblique for trochlear N

2lateral rectus. For abducent N

3-dilator pupillae. **Sympathetic**

1)-Superior division:-

1 Levator palpebrea superioris.

2 Superior rectus.

2)-Inferior division:-

1Medial rectus.

2-Inferior rectus.

3-Inferior oblique.

3)-Parasympathetic innervation:-

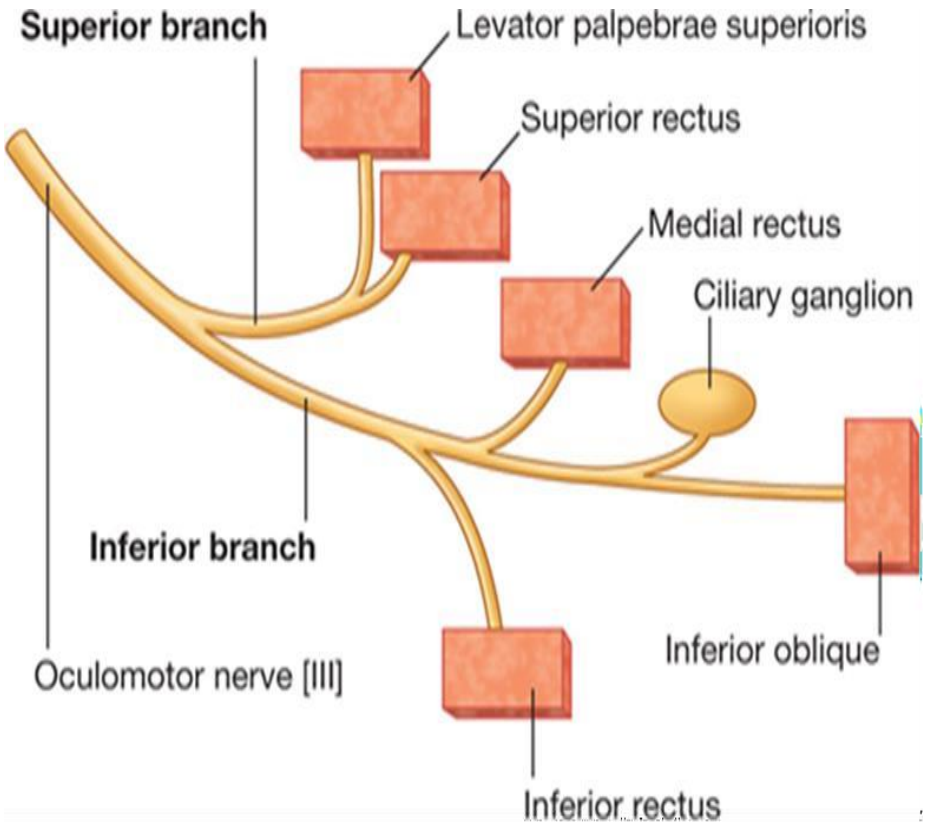
=in nerve to inferior oblique

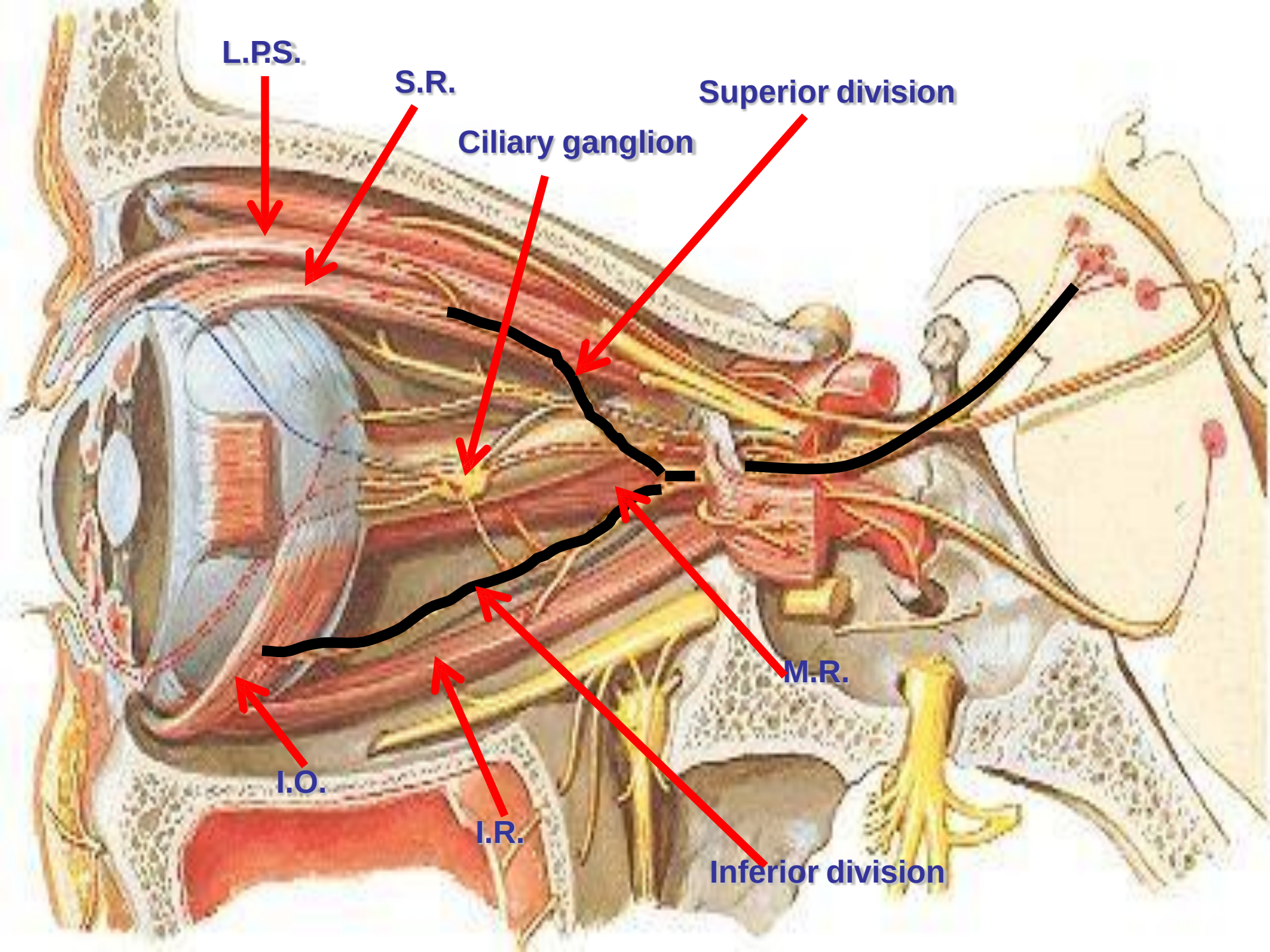
=from ciliary ganglion .

=It supplies :-

1 Ciliary muscles.

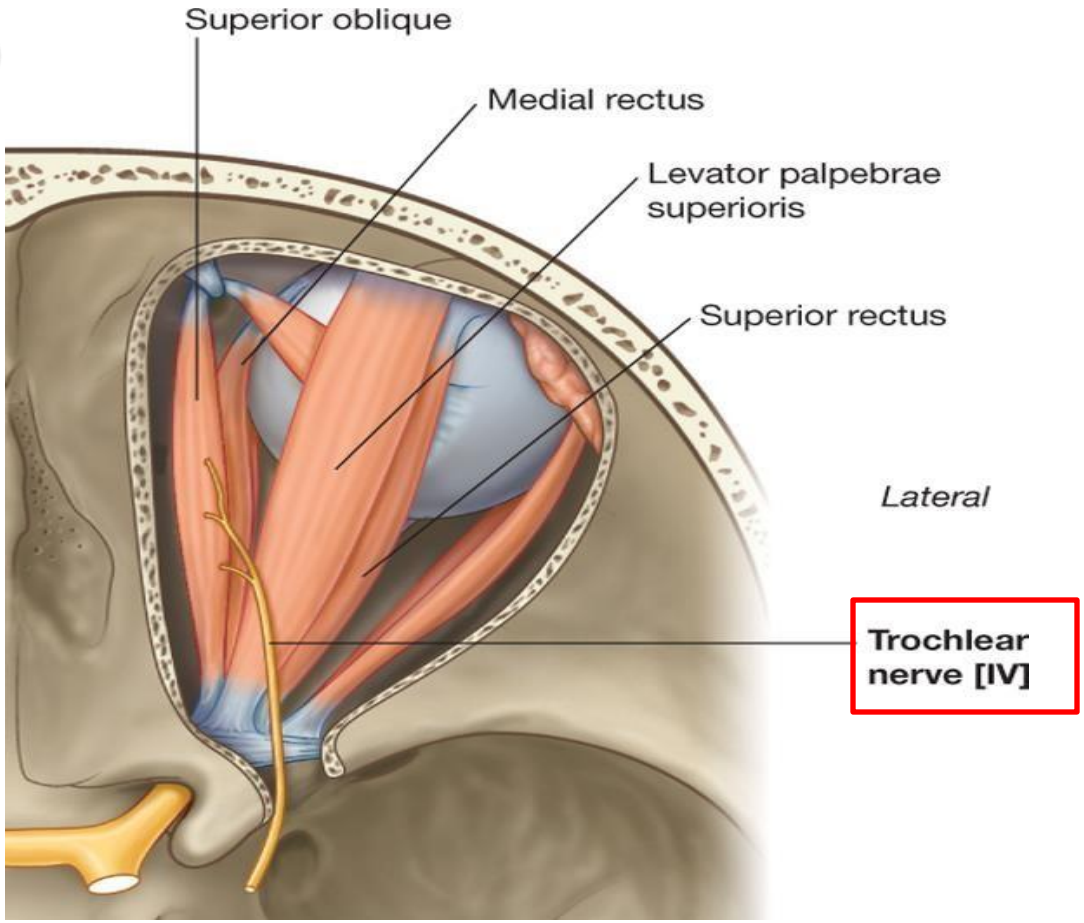
2 Sphincter pupillae .




L.P.S.
S.R.
Superior division
Ciliary ganglion
M.R.
I.O.
I.R.
Inferior division

Trochlear nerve

(4th cranial nerve)



TYPE OF FIBERS:- Motor

ATTACHEMENT:-

=emerges from POSTERIOR aspect of MIDBRAIN.

Exit from skull:-

=via lower part of **SUPERIOR ORBITAL FISSURE**

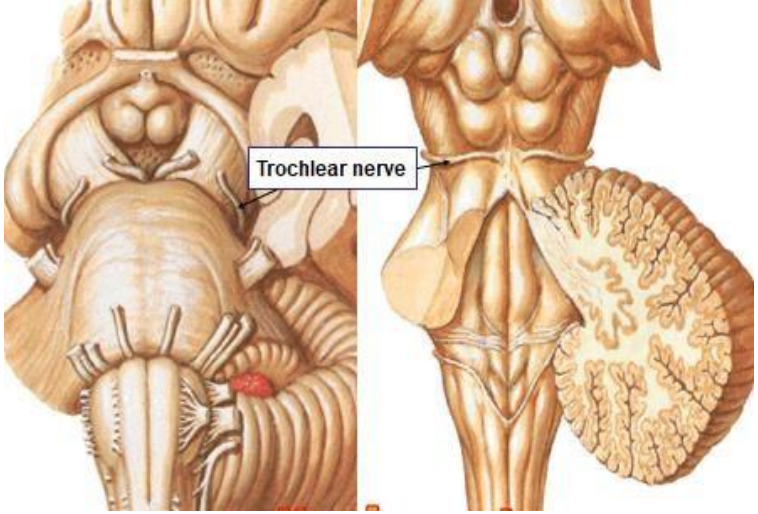
= outside the tendinous ring

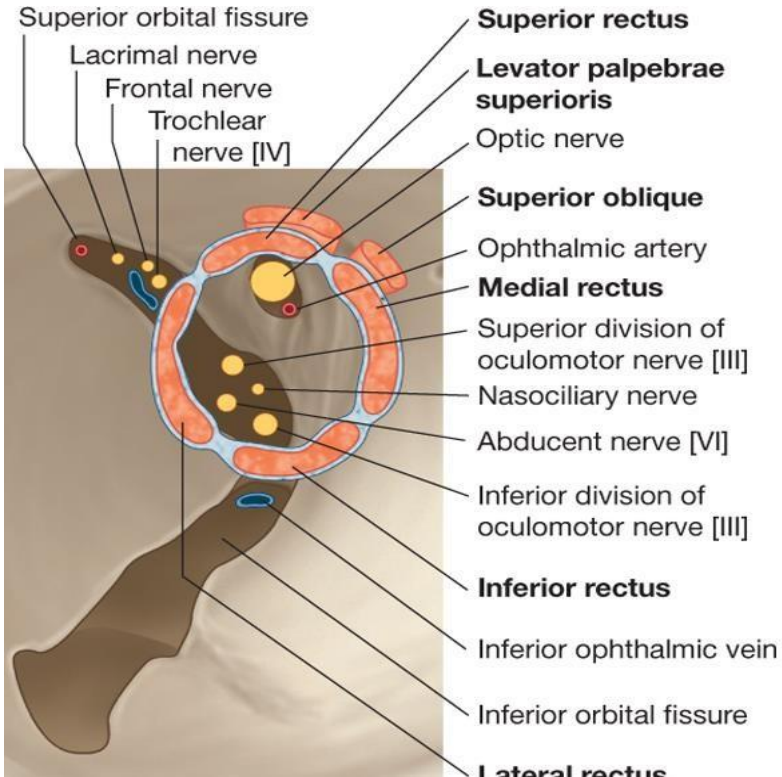
COURSE:-

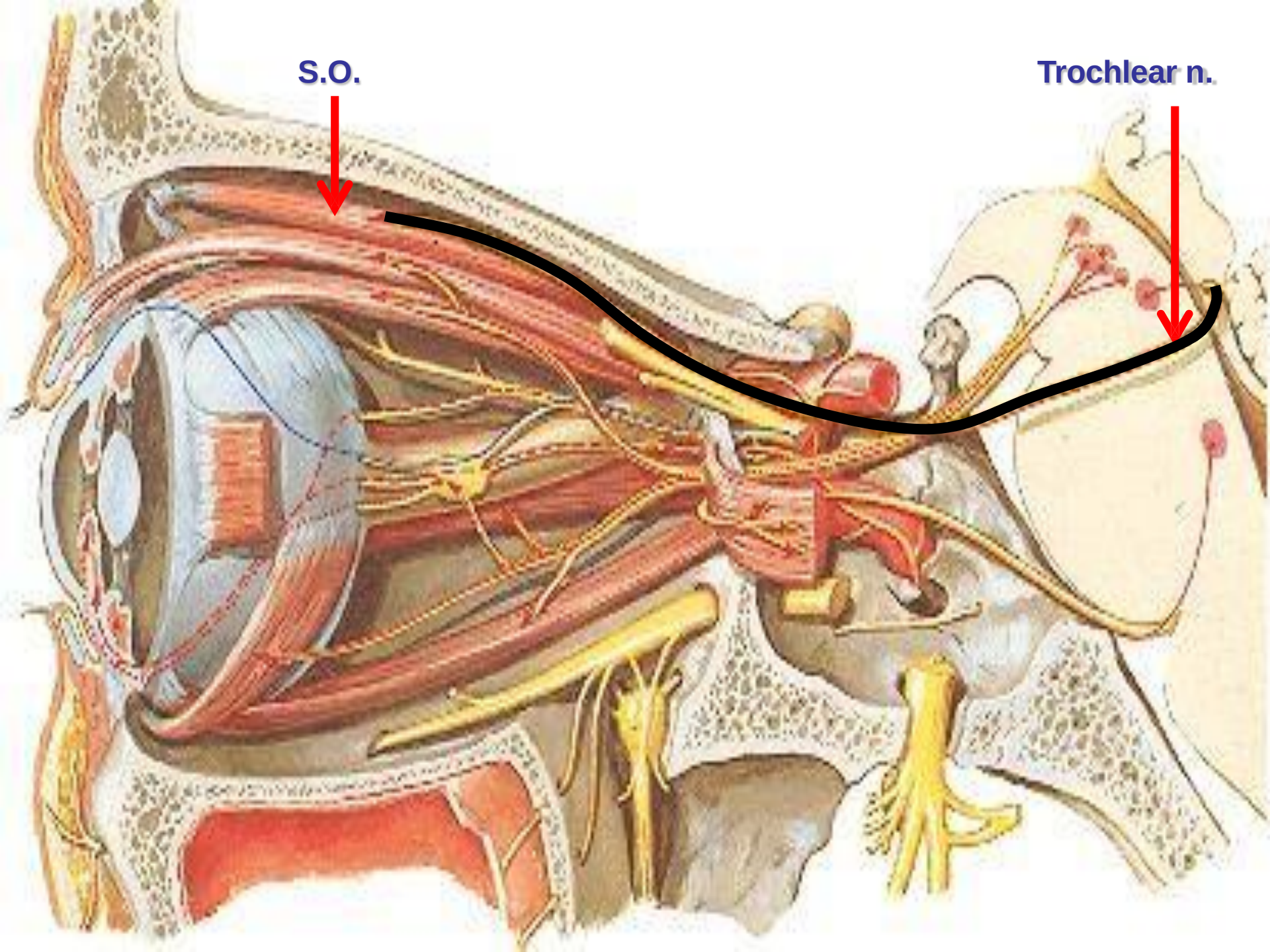
1=pierces dura AT point of crossing of free and attached border of *tentorium cerebelli*

2=runs forwards in LATERAL WALL OF CAVERNOUS SINUS=*BELOW OCULOM.N*.

Distribution:- to Superior oblique of eye(So4)






S.O.
Trochlear n.

Abducent nerve

(6th cranial nerve)

TYPE :- Motor

ATTACHEMENT:-

=emerges from ANTERIOR aspect of Brain stem.

=in groove ( ) lower border of PONS and PYRAMID OF M.O. .

Exit from skull:-

=via lower part of SUPERIOR ORBITAL FISSURE (inside the common tendinuous ring).

COURSE:-

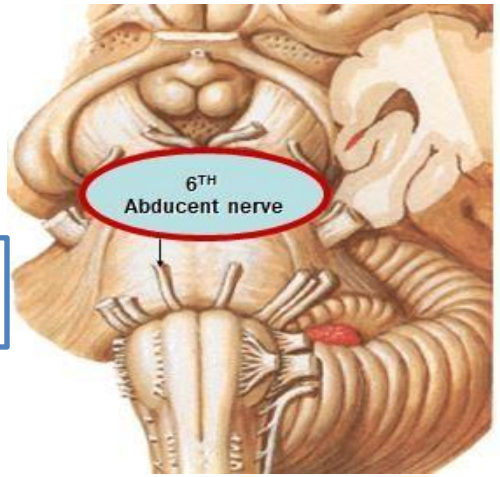
1=pierces dura of posterior cranial fossa AT CLIVUS.

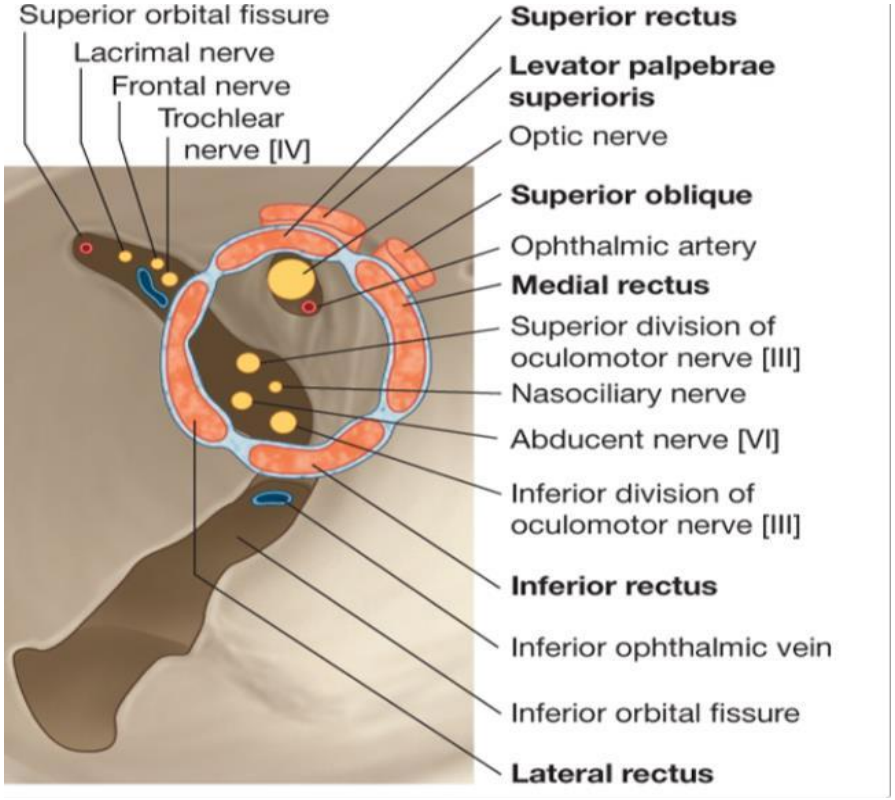
2=runs forwards in FLOOR OF CAVERNOUS SINUS

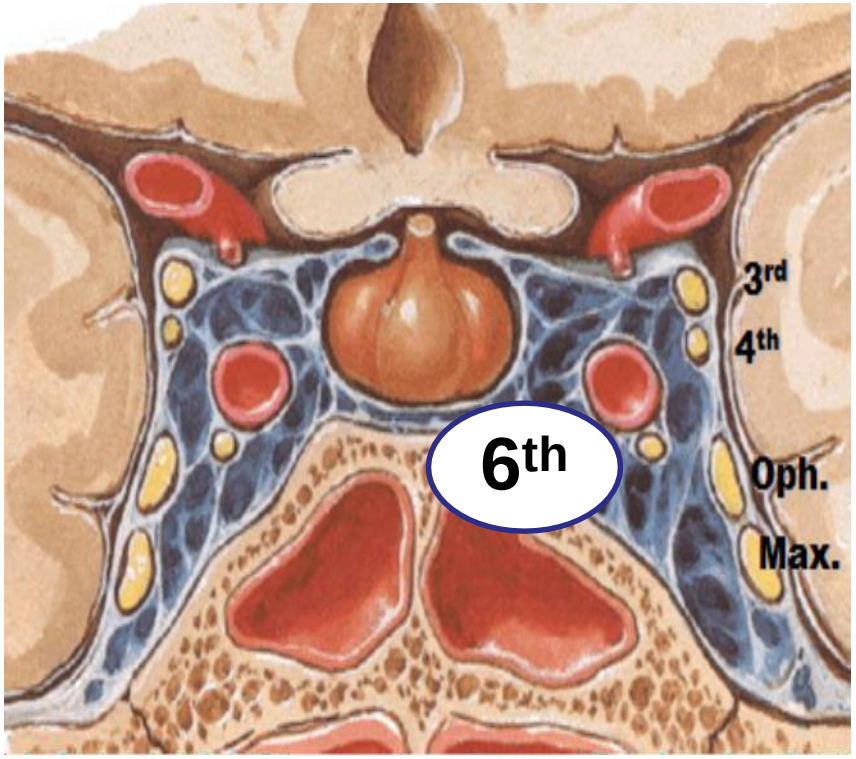
=*INFERO-LATERAL TO I.C.A*

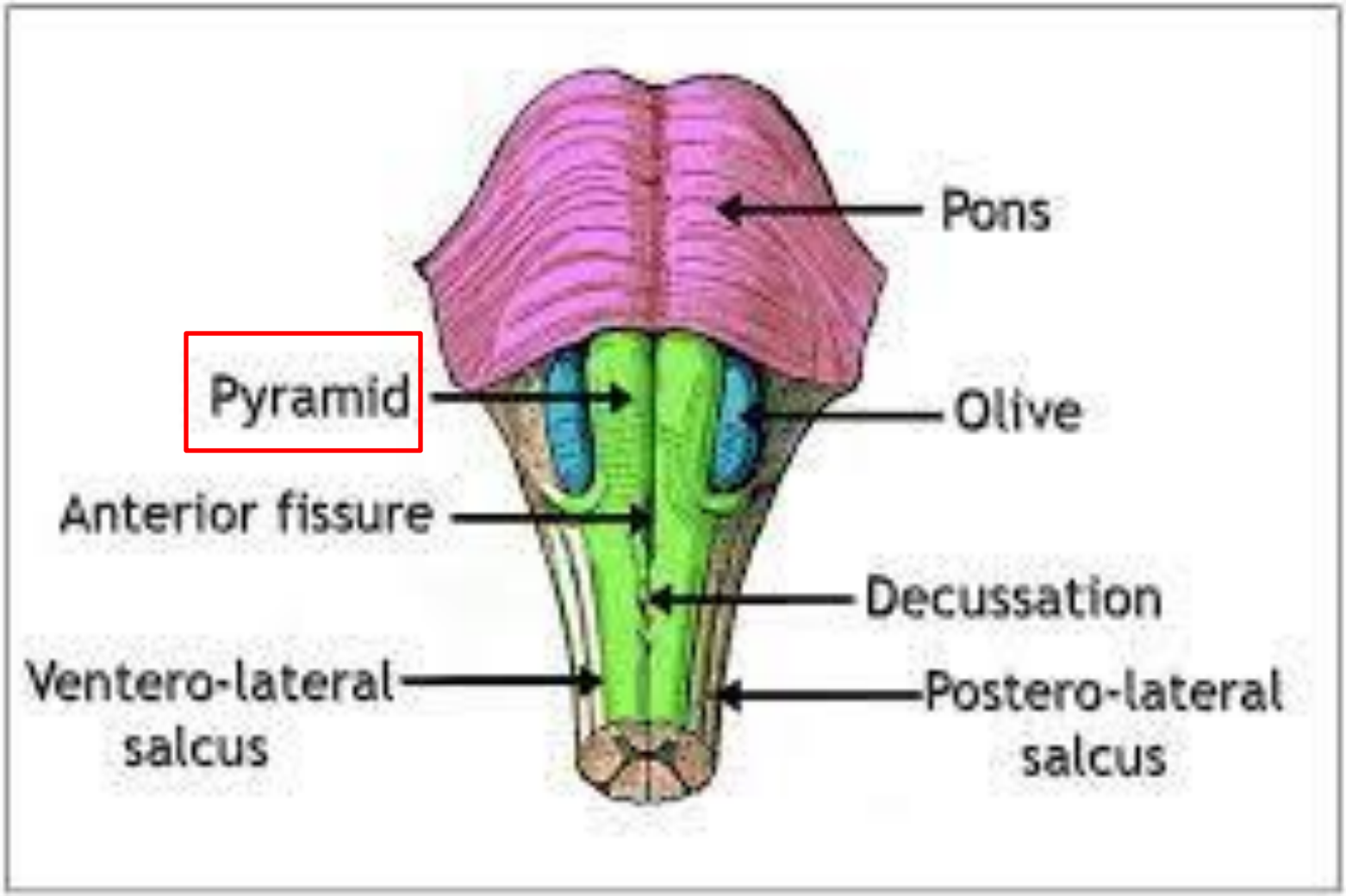
Distribution:- to Lateral rectus of eye(Lr 6)

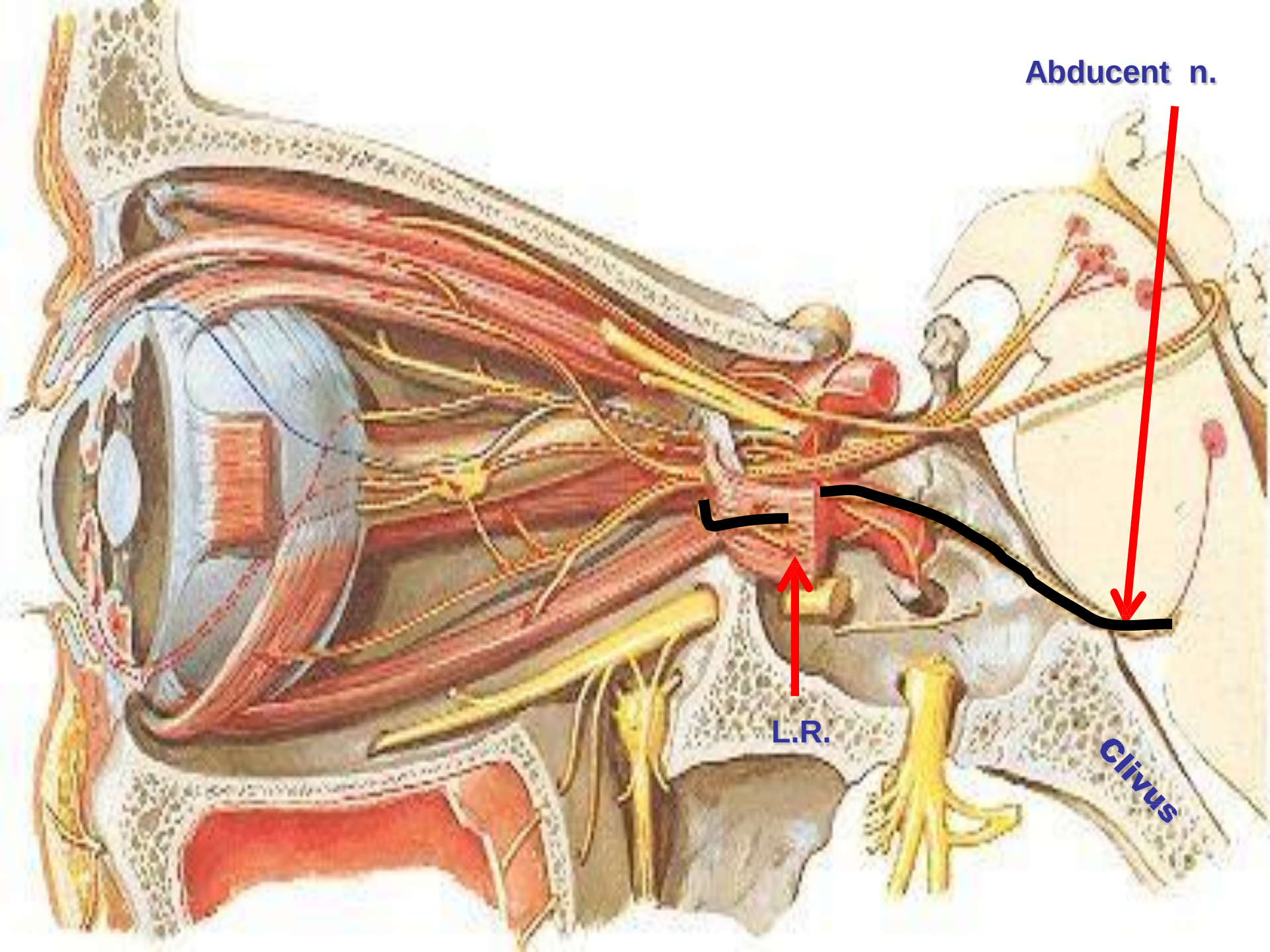
medulla oblongata








Pons
Pyramid
Olive
Anterior fissure
Decussation
Ventero-lateral salcus
Postero-lateral salcus


Abducent n.
L.R.
Clivus

Blood supply

Ophthalmic artery

Origin:

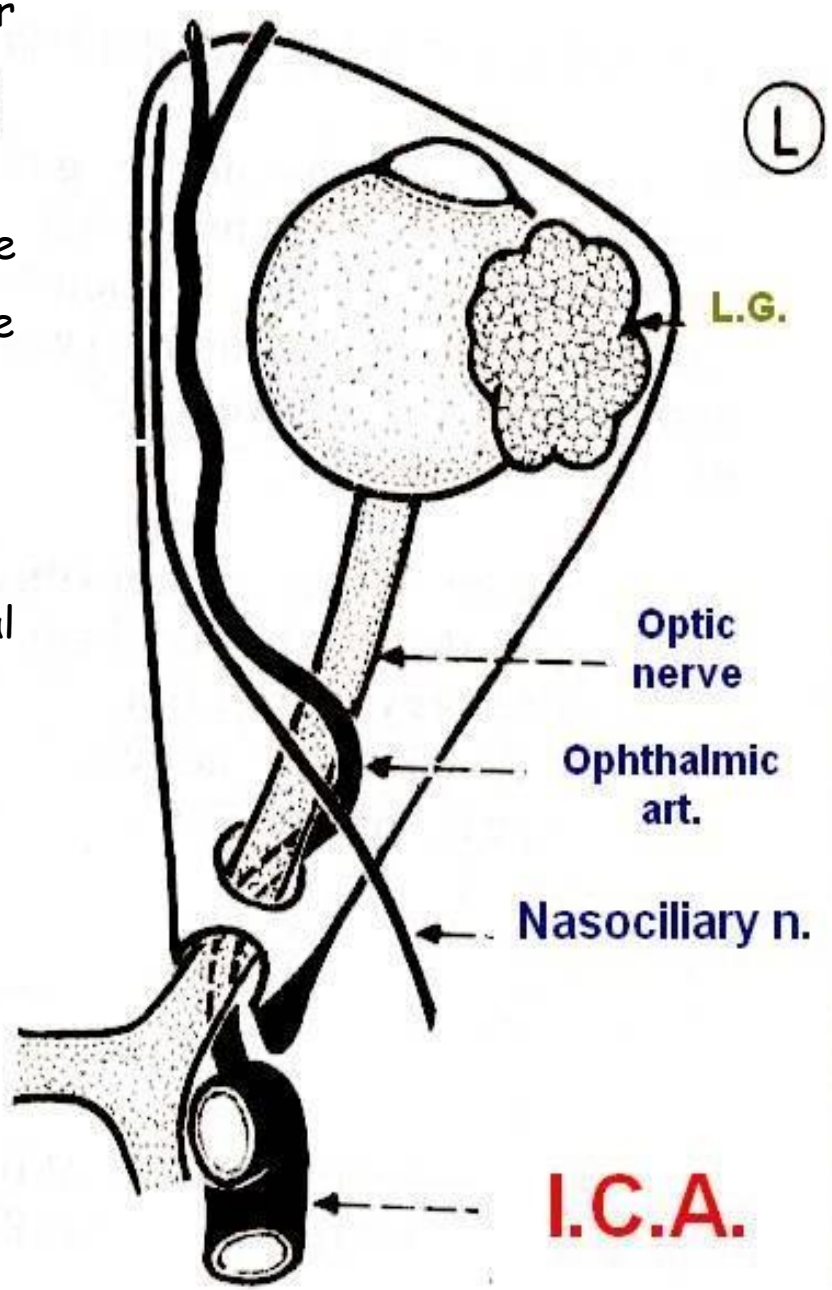
- It arises from the internal carotid artery (after it emerge from the cavernous sinus)

Course and relations:

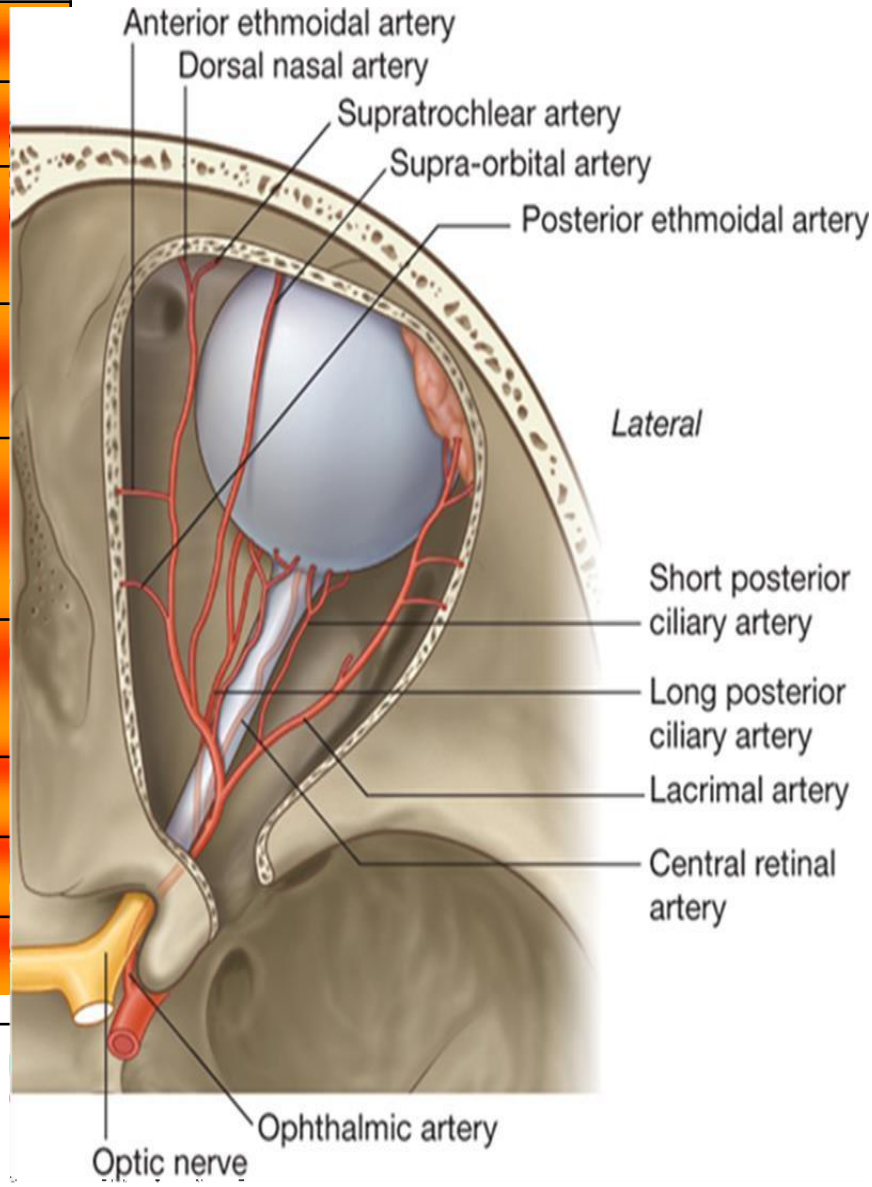
- The ophthalmic artery runs forward through the optic canal on the lateral side of the optic nerve to enter the orbital cavity.

Termination:

- It ends close to the medial part of the upper eyelid by dividing into supratrochlear and dorsal nasal branches.



Lady	1.Lacrimal artery
Students	2.Supra-orbital artery
Must	3.Meningeal artery. 4.Muscular branches
Remember	5.central Retinal artery
Ciliary	6.Long Ciliary arteries [anterior] 7.short Ciliary arteries [posterior]
Epithelium	8.Anterior Ethmoidal arteries 9.posterior Ethmoidal arteries
Belong	10.medial Palpebral artery.
Nasal	11.Dorsal Nasal artery
Sinuses	12.Supra-trochlear artery.



OPHTHALMIC VEINS

1]=Superior ophthalmic vein. **2]=Inferior ophthalmic vein.**

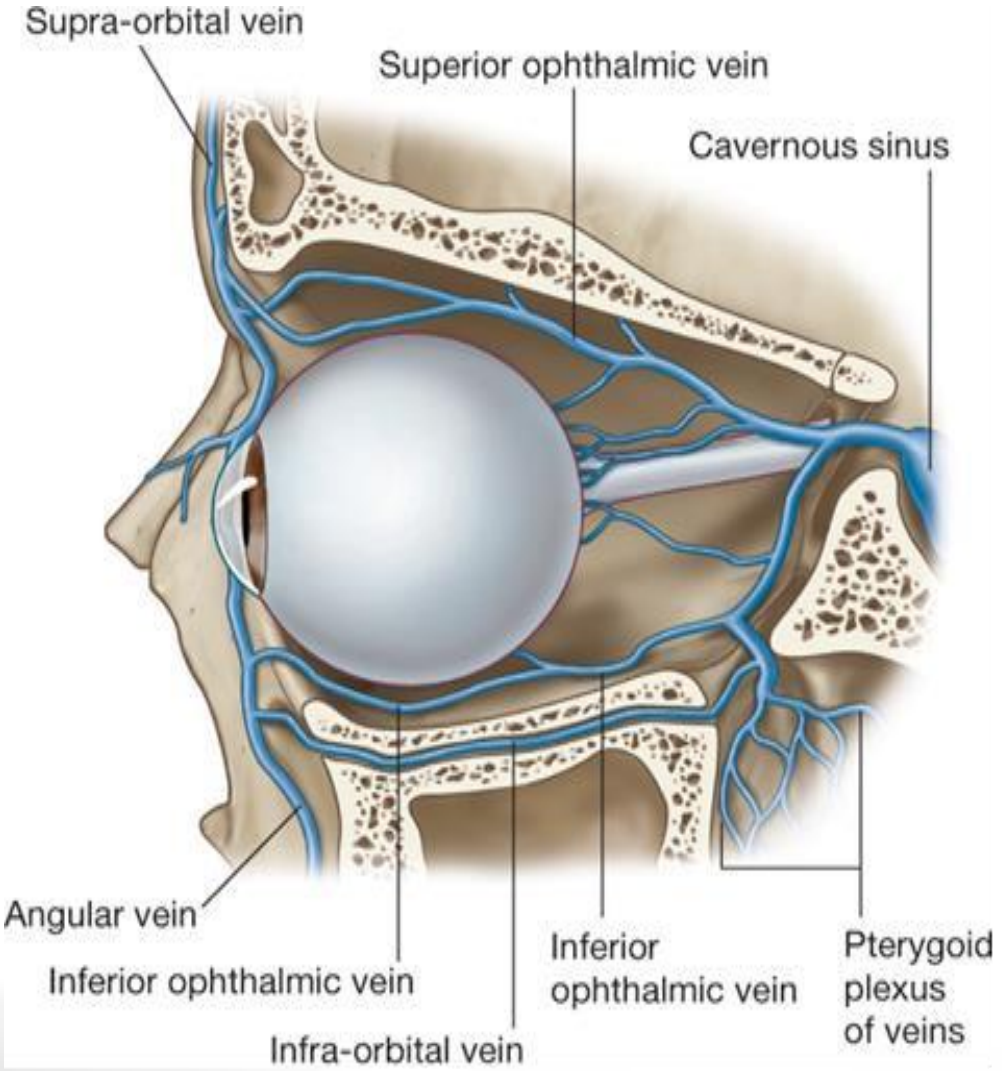
TERMINATION:-

=Drain into cavernous sinus
=via superior orbital fissure.
=Inferior ophthalmic vein
may pass via inferior orbital fissure to pterygoid plexus of vein.

COMMUNICATIONS:-

they communicate with:-

1)-Anterior facial vein:- at medial orbital margin. [superior ophthalmic vein only]
2)-Pterygoid venous plexus.
3)-Pharyngeal """""""""""""""""""""""""".
via inferior orbital fissure.



Lacrimal Apparatus

1-The lacrimal gland.

Site → it has 2 parts surrounds the lateral margin of the levator palpebrae superioris muscle:

1-Orbital part (main part): in the lacrimal fossa in the anterolateral part of the roof of the orbit.

2-Palpebral part: in the lateral part of the upper eyelid.

Ducts → 12 ducts open in to the superior fornix of conjunctiva

3-The conjunctival sac: the space between the outer surface of the eyeball and the inner surface of the eyelid.

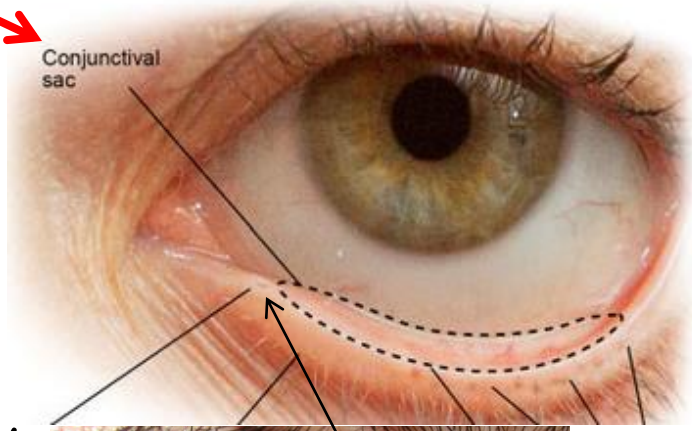
4-The lacrimal puncta: 2 minute openings located on the inner margin of each eyelid.

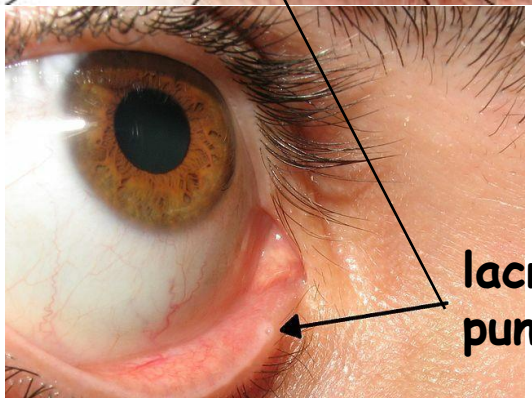
5-The lacrimal canaliculi (superior & inferior)

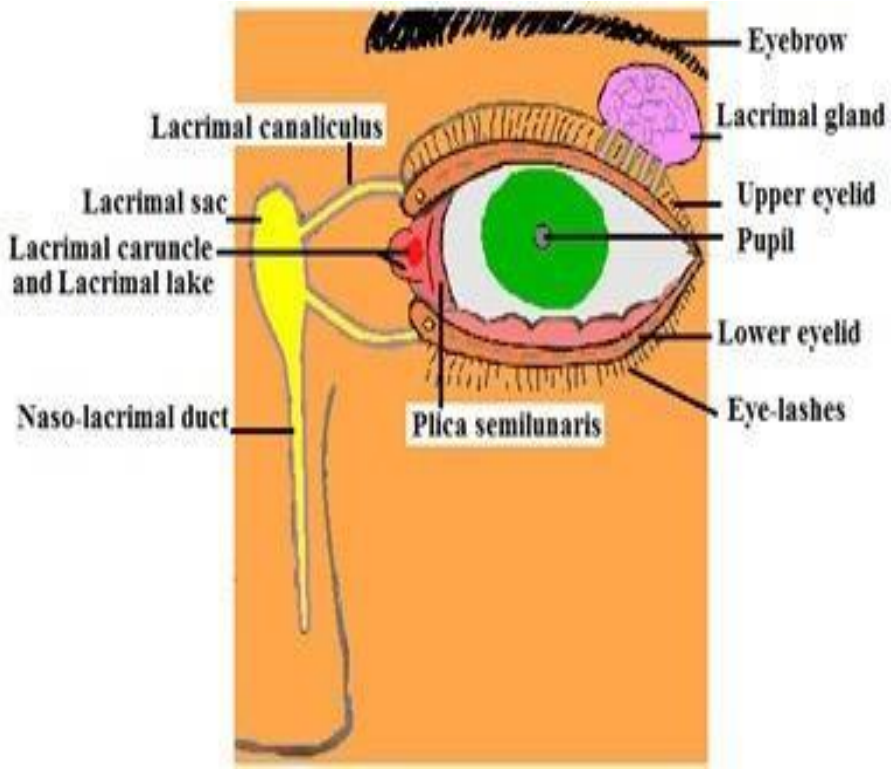
6-The lacrimal sac: in the lacrimal fossa

7-The nasolacrimal duct:

- It runs in the bony nasolacrimal canal.
- It opens in the **lateral wall** of the nasal cavity below the inferior nasal concha.







Eyelids
Anterior View