

# **Peripheral Nervous System**

## **THE EYELIDS , EXTRAOCULAR MUSCLES & 3<sup>rd</sup>, 4<sup>th</sup>, 6<sup>th</sup> CRANIAL NERVES**

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**2024-2025**

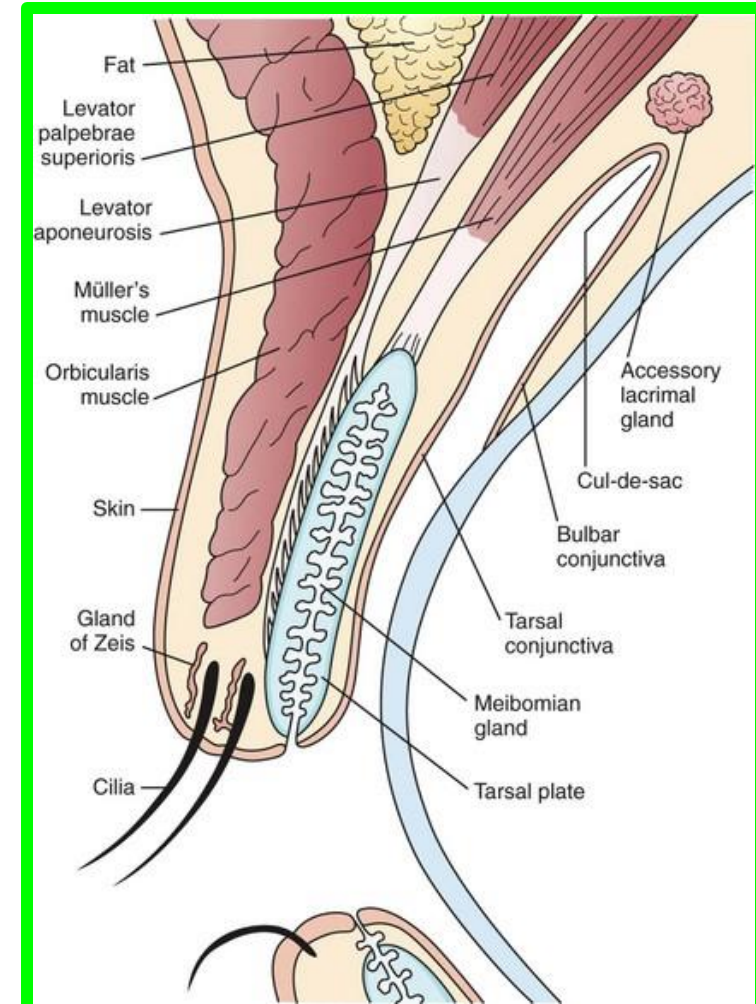
**Thursday 27 February 2025**

# Eyelids

✓ The superficial surface of the eyelids is covered by skin, and the deep surface is covered by a mucous membrane called **the conjunctiva**.

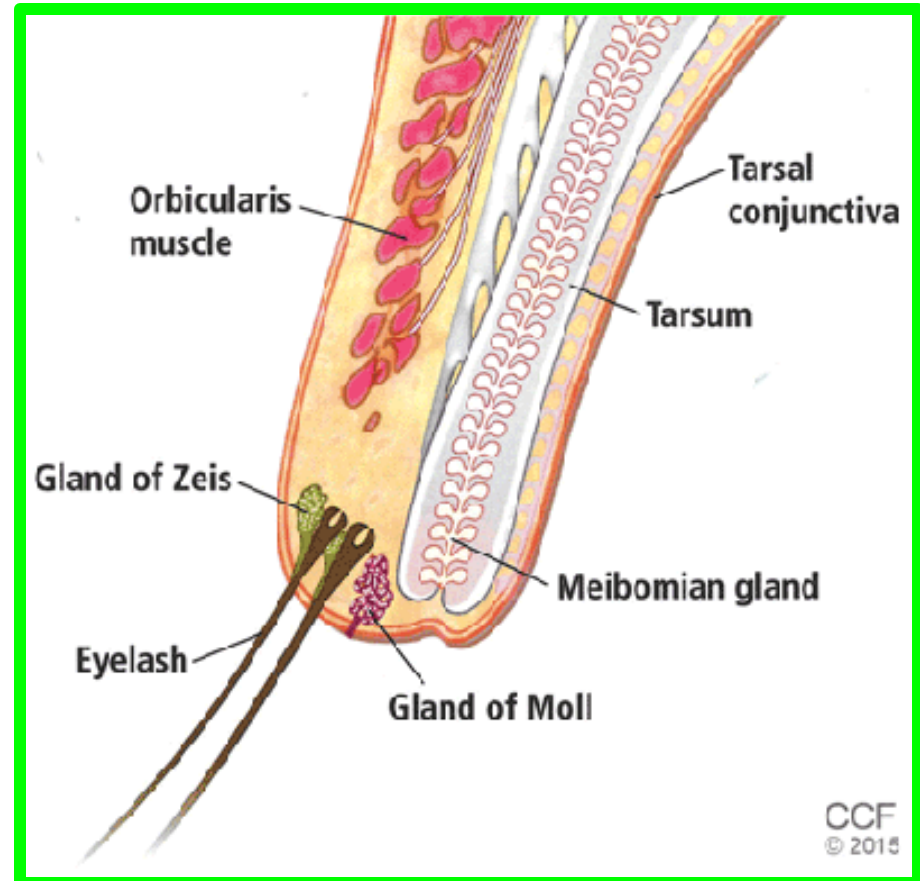
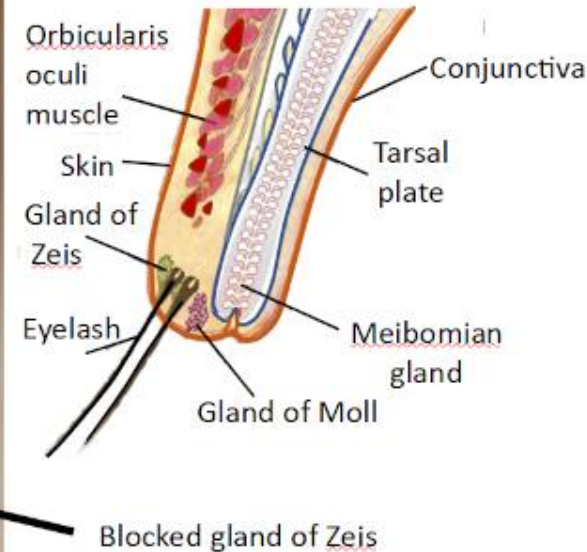
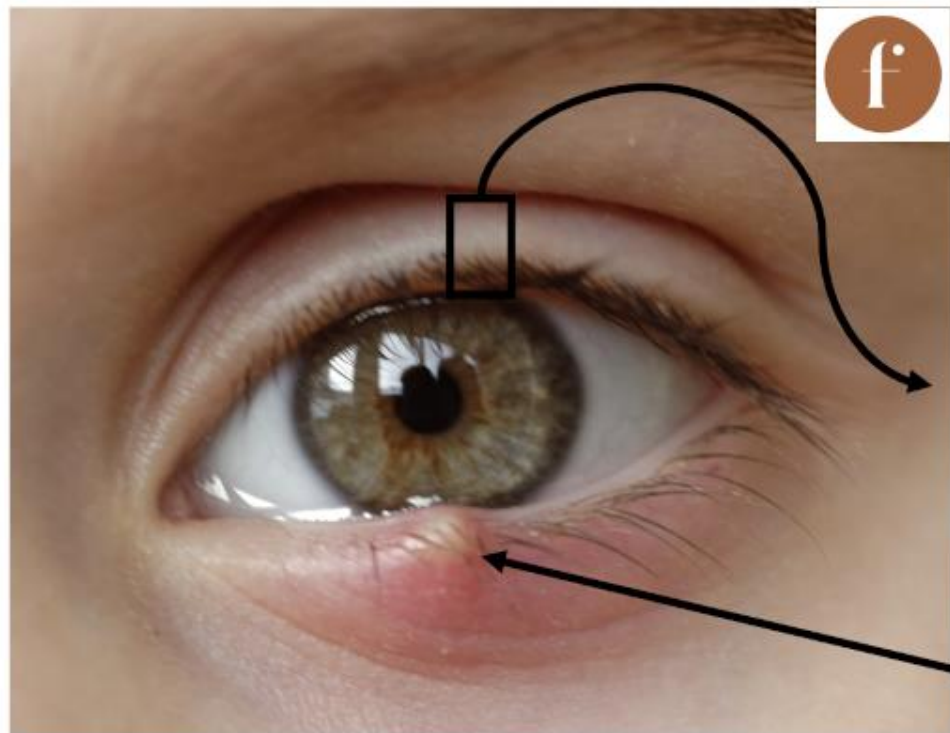
✓ The **eyelashes** are short, curved hairs on the free edges of the eyelids

✓ They are arranged in double or triple rows at the mucocutaneous junction.

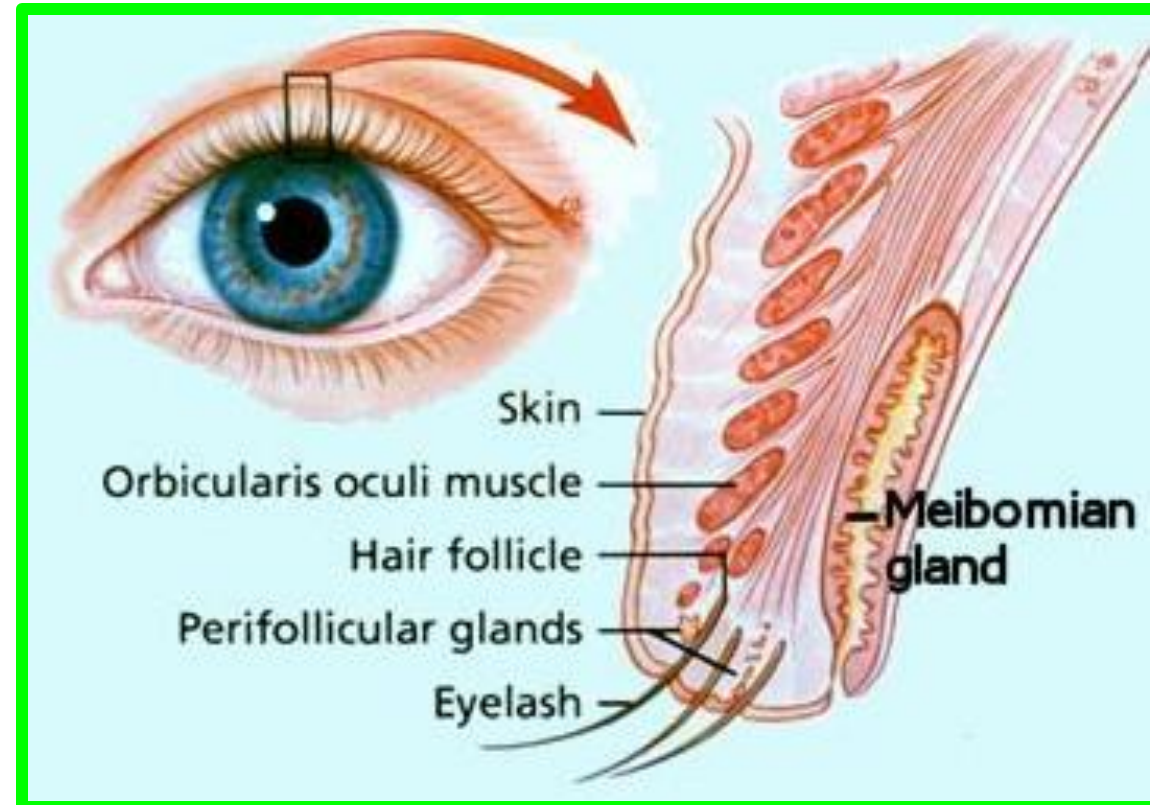
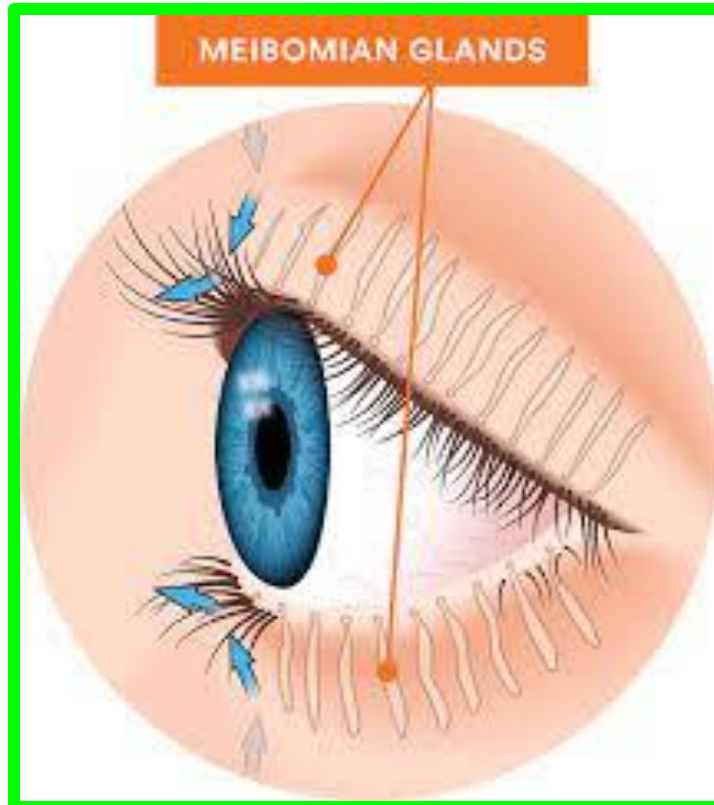


✓ The sebaceous glands (*glands of Zeis*) open directly *into the eyelash follicles*.

✓ The ciliary glands (*glands of Moll*) are modified sweat glands that open separately *between adjacent lashes*.



✓ **The tarsal glands** are long, modified sebaceous glands that pour their oily secretion onto the margin of the lid; **their openings lie behind the eyelashes**





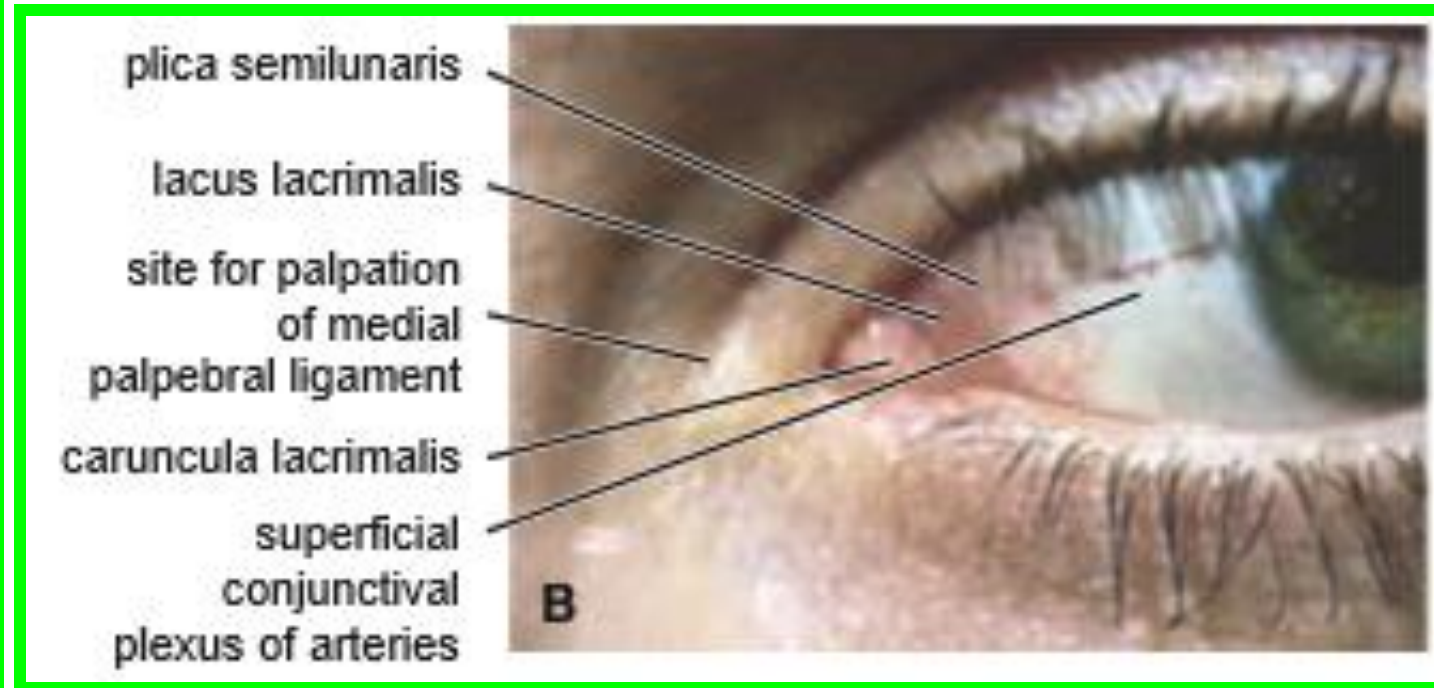
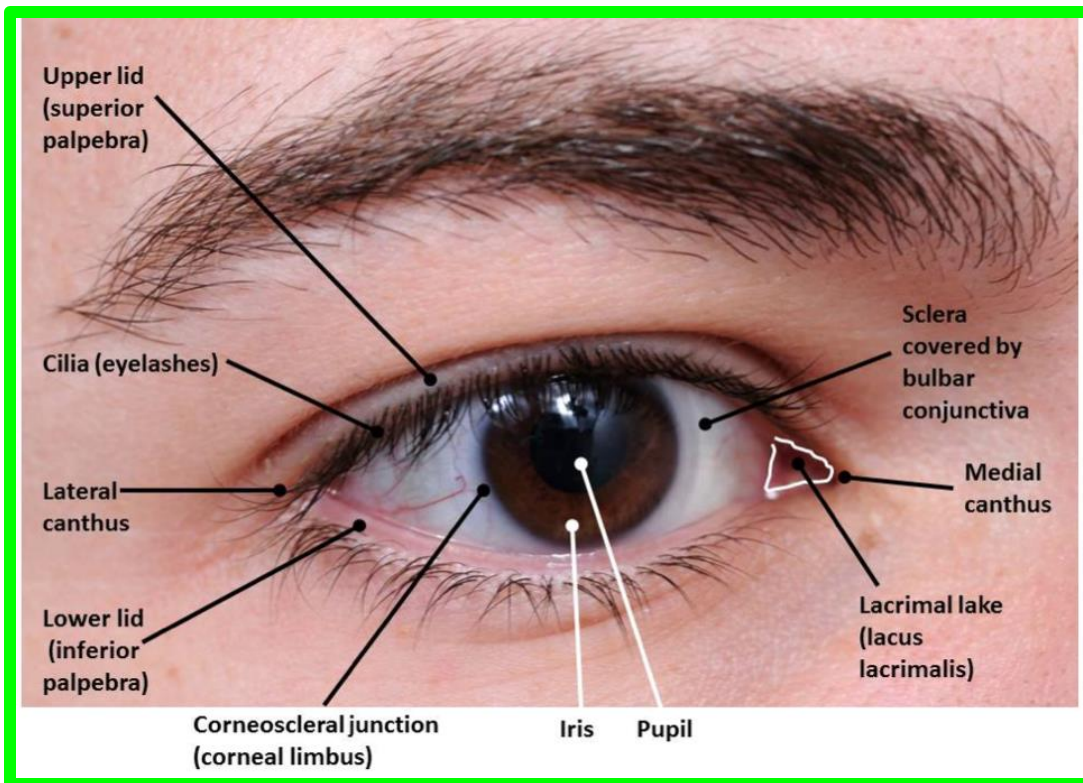
# Eyelids

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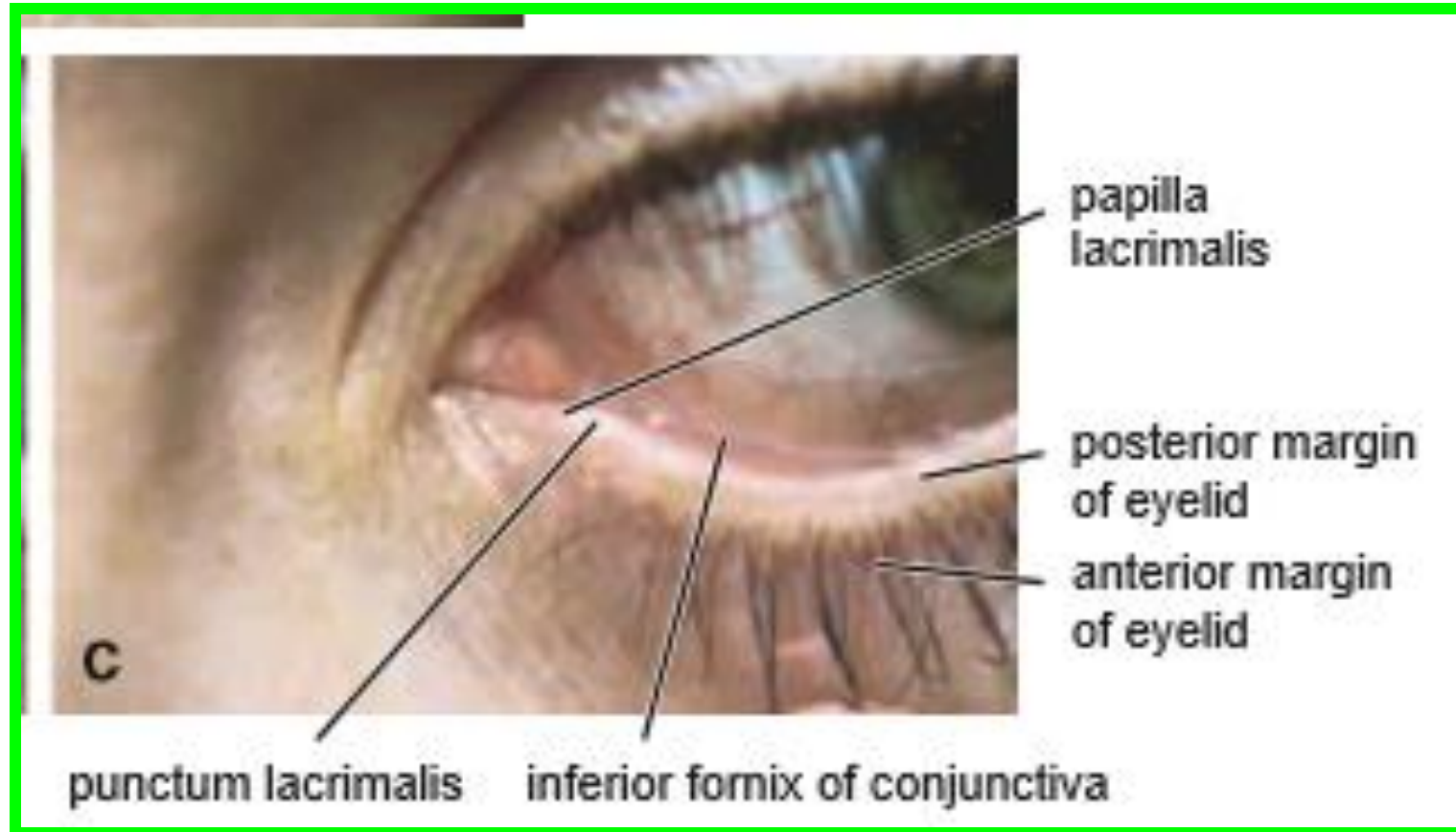
- ✓ The more rounded medial angle is separated from the eyeball by a small space, **the lacus lacrimalis**, in the center of which is a small, **reddish yellow elevation**, **the caruncula lacrimalis**
- ✓ A reddish semilunar fold, called **the plica semilunaris**, lies on the lateral side of the caruncle.



# Eyelids

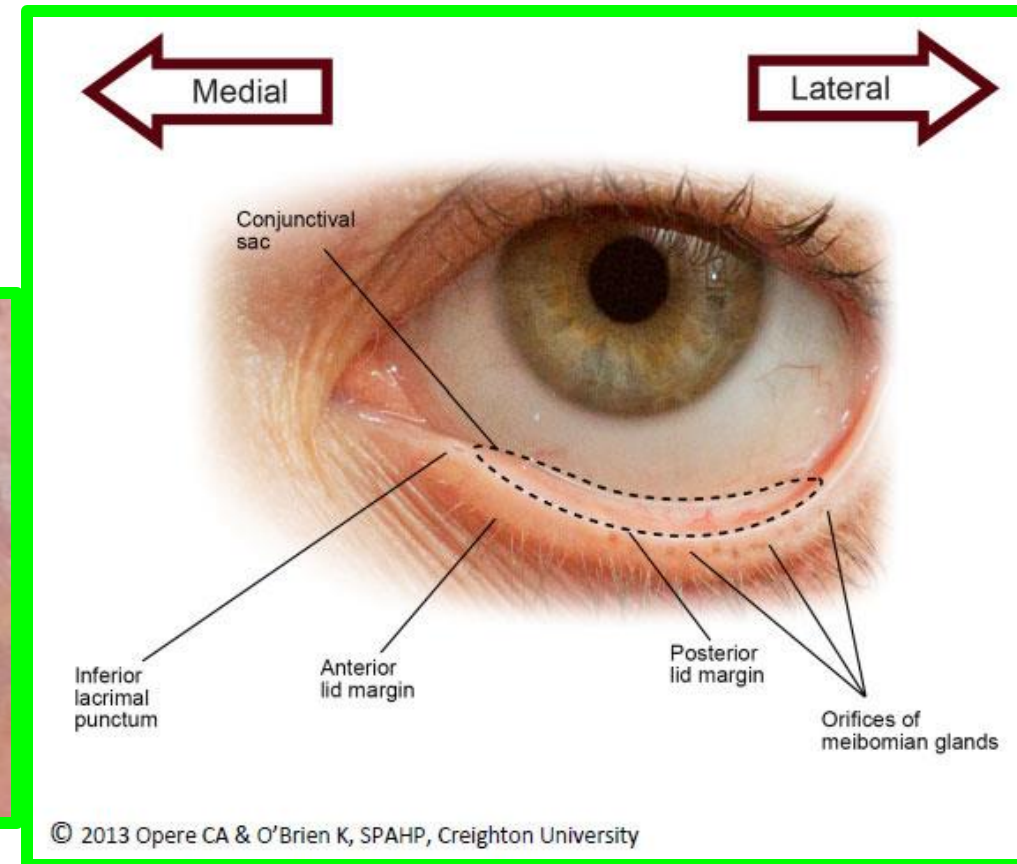
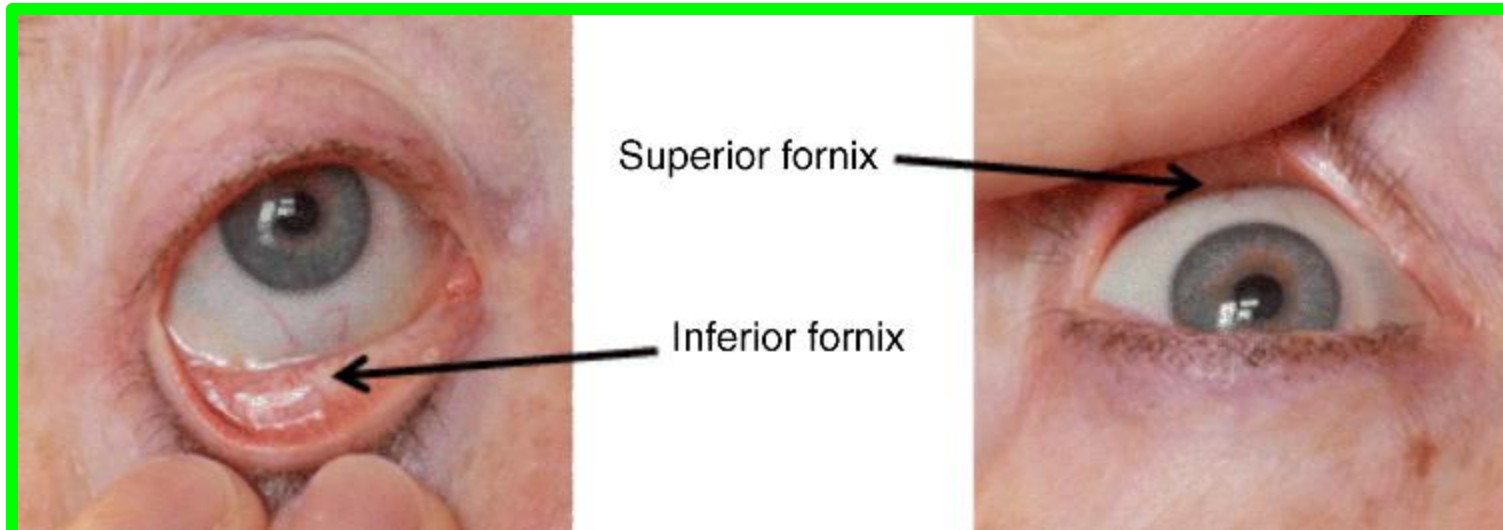
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- ✓ Near the medial angle of the eye a small elevation, **the papilla lacrimalis**, is present.
- ✓ On the summit of the papilla is a small hole, **the punctum lacrimale**, which leads into **the canaliculus lacrimalis**
- ✓ The papilla lacrimalis projects into **the lacus**,
- ✓ **the punctum** and **canaliculus** carry tears down into **the nose**



## The conjunctiva

- ✓ is a thin mucous membrane that lines the eyelids and is reflected at the **superior** and **inferior fornices** onto the anterior surface of the eyeball
- ✓ Its epithelium is continuous with that of **the cornea**.

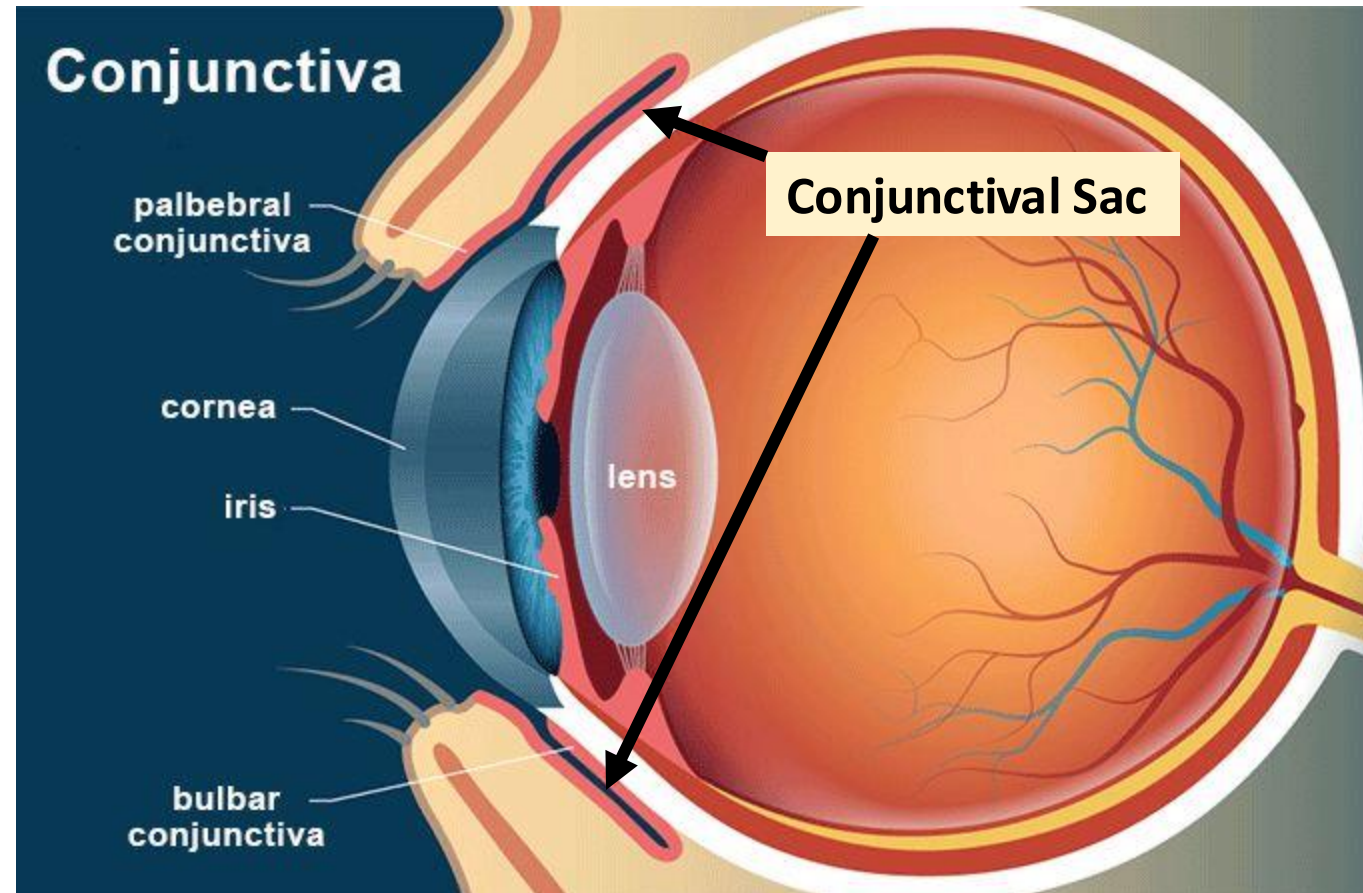
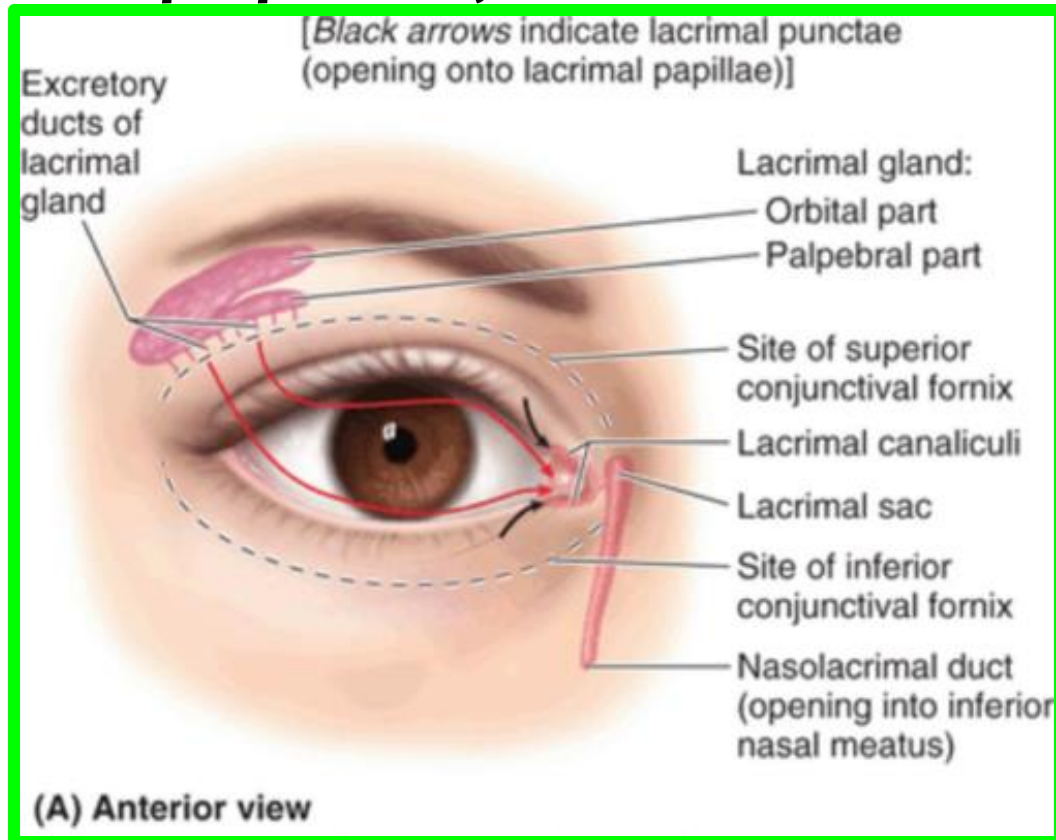




# Eyelids

✓ The upper lateral part of **the superior fornix** is pierced by **the ducts of the lacrimal gland**

The conjunctiva thus forms a potential space, **the conjunctival sac**, which is open at the palpebral fissure.

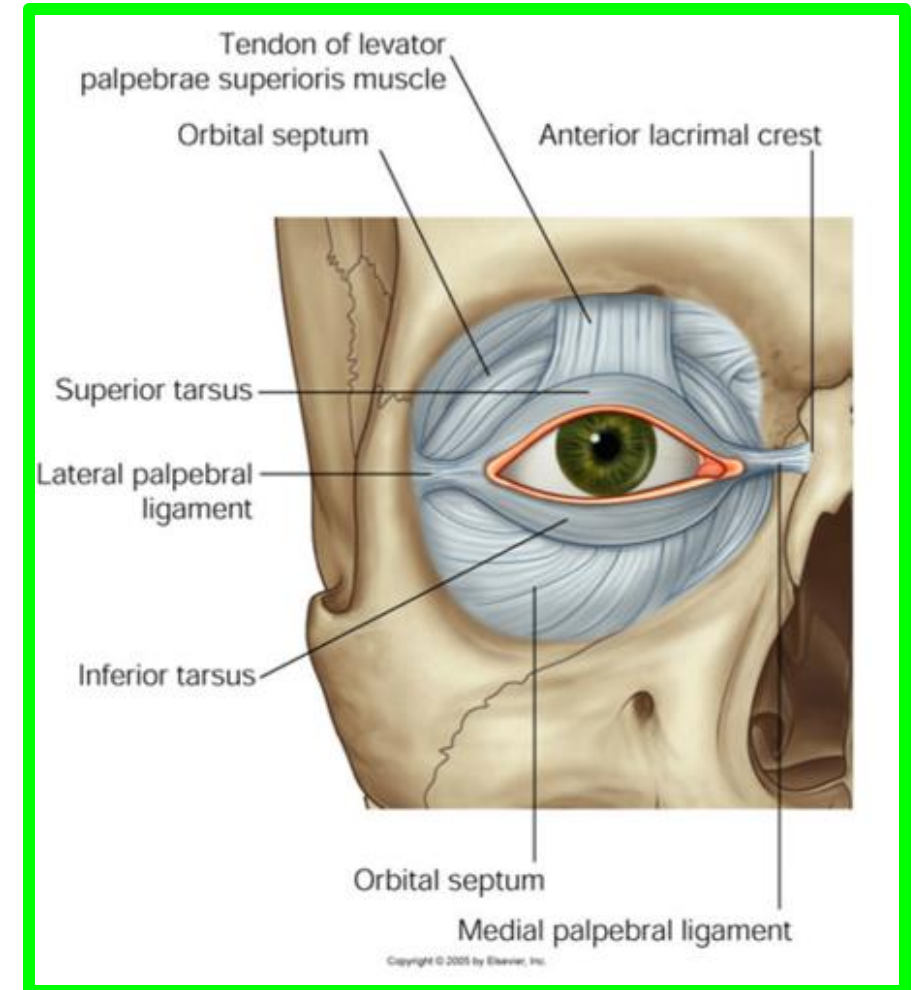




# Eyelids

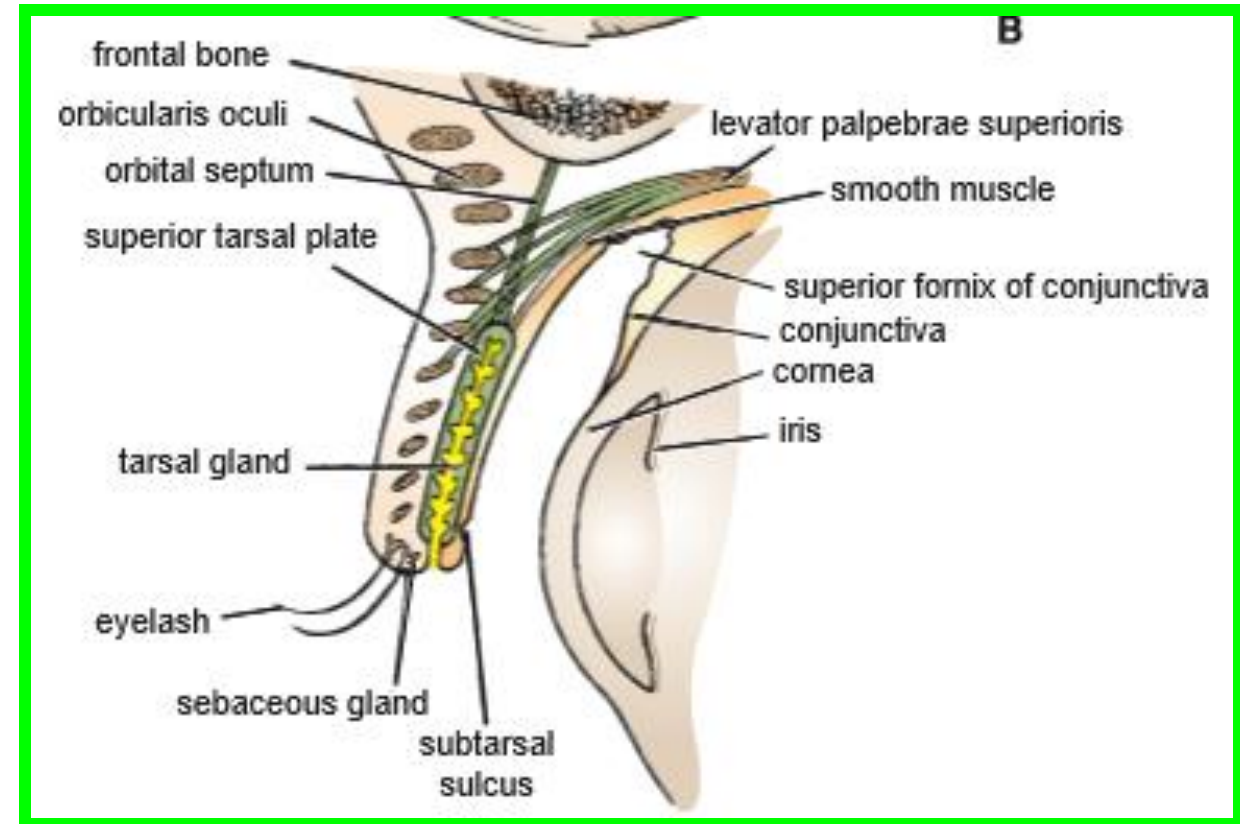
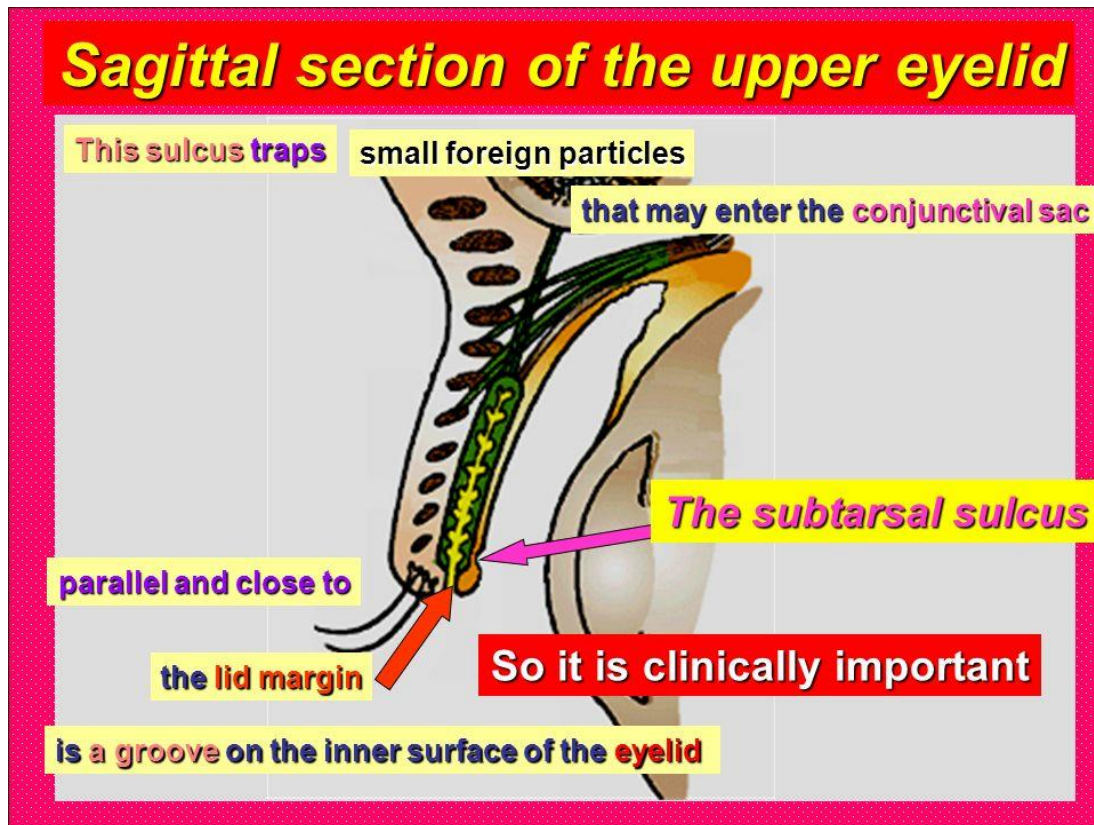
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- ✓ The framework of the eyelids is formed by a fibrous sheet, **the orbital septum**
- ✓ This is attached to the periosteum at the orbital margins.
- ✓ The orbital septum is thickened at the margins of the lids to form **the superior and inferior tarsal plates**.
- ✓ The **tarsal glands** are embedded in the posterior surface of **the tarsal plates**.

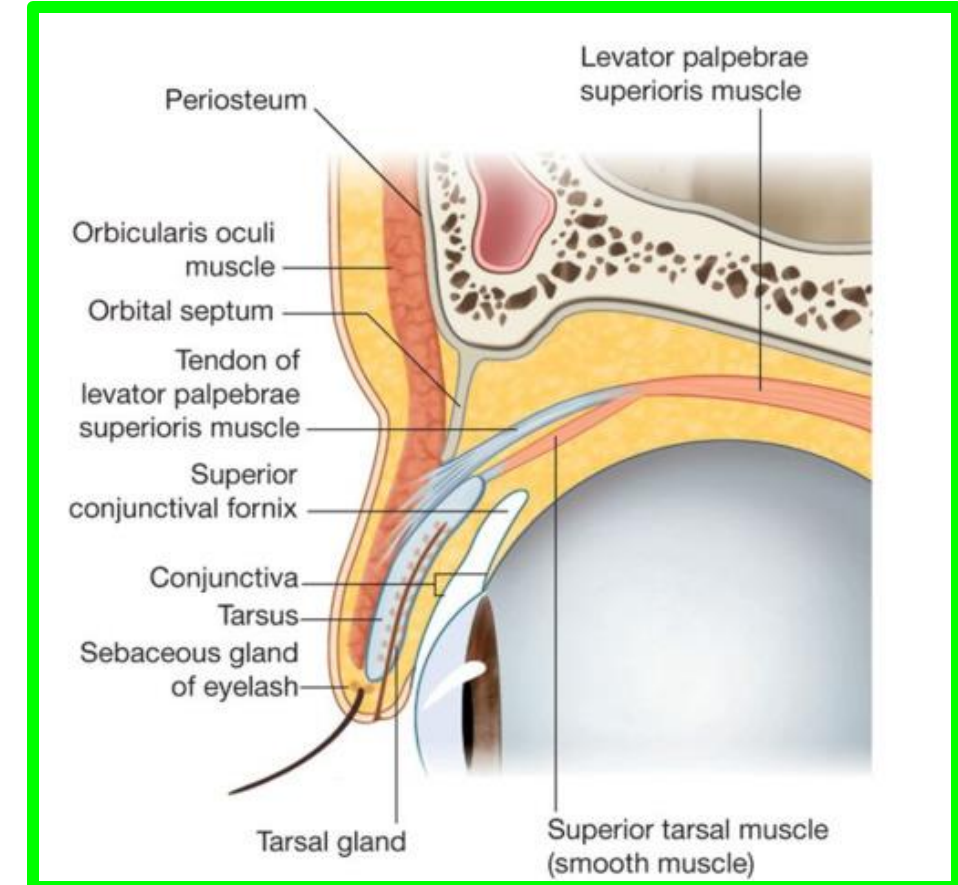
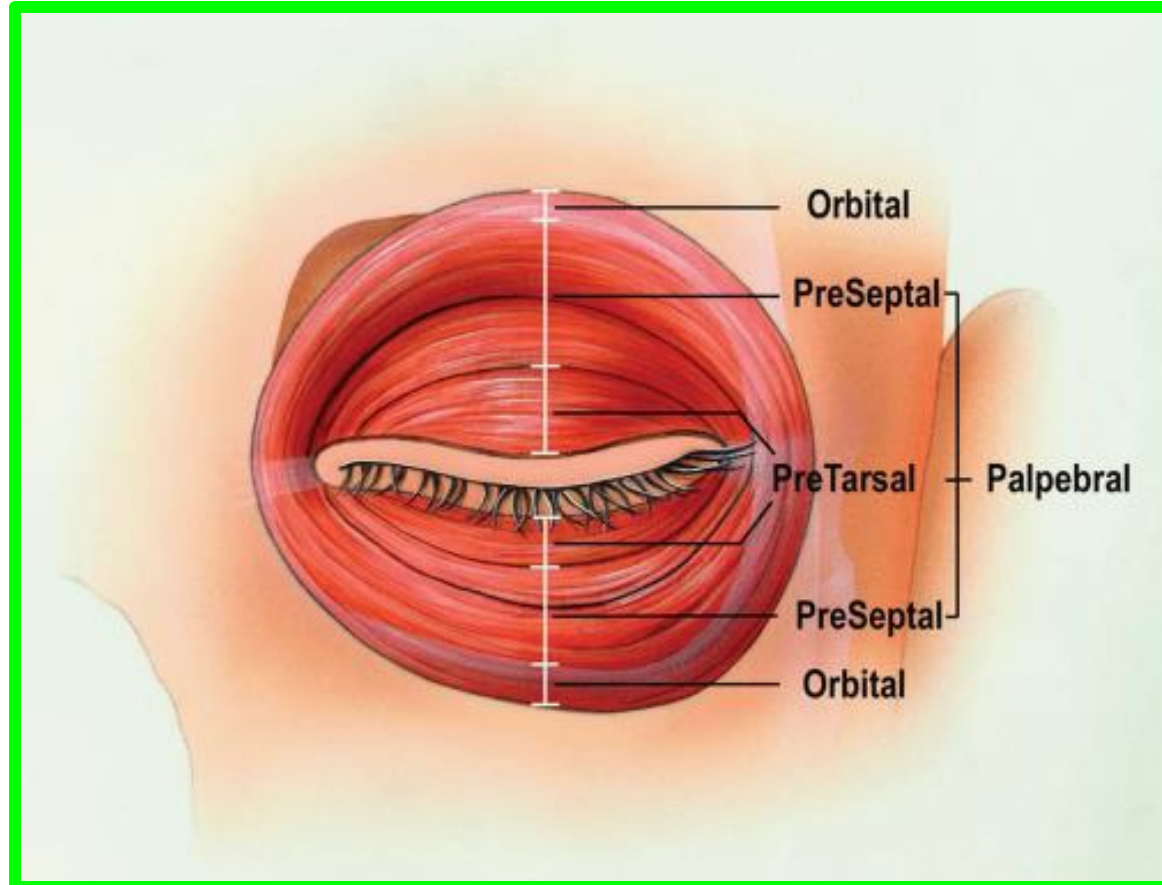


# Eyelids

- ✓ Beneath the eyelid is a groove, **the subtarsal sulcus**, which runs close to and parallel with the margin of the lid.
- ✓ The sulcus tends to **trap small foreign particles introduced into the conjunctival sac** and is thus clinically important.



- ✓ The superficial surface of the tarsal plates and the orbital septum are covered by the palpebral fibers of the orbicularis oculi muscle
- ✓ The aponeurosis of insertion of the levator palpebrae superioris muscle pierces the orbital septum to reach the anterior surface of the superior tarsal plate and the skin





# EXTRAOCULAR MUSCLES OF ORBIT

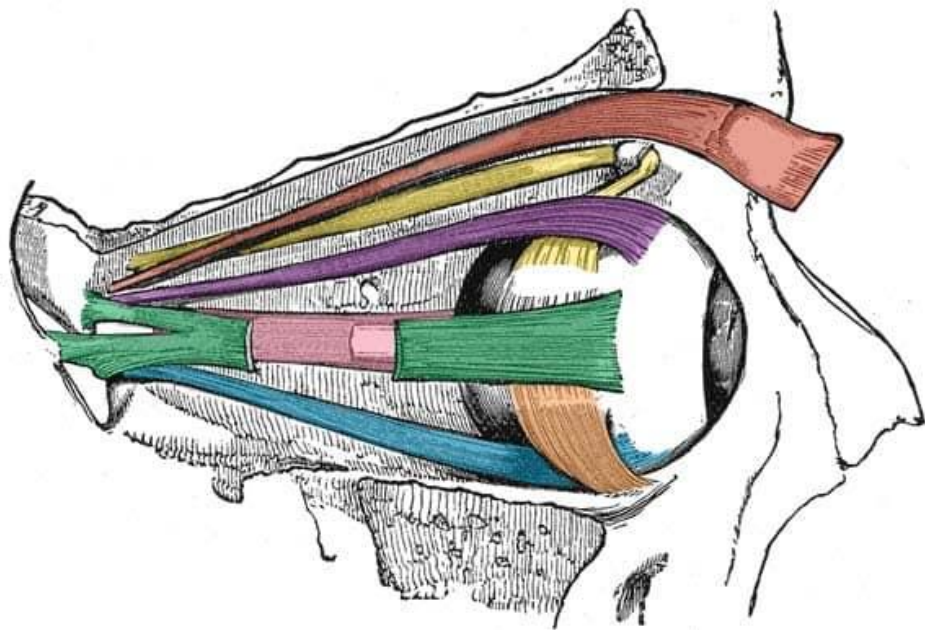
**Muscle:** *Superior rectus*

**Origin:** common tendinous ring

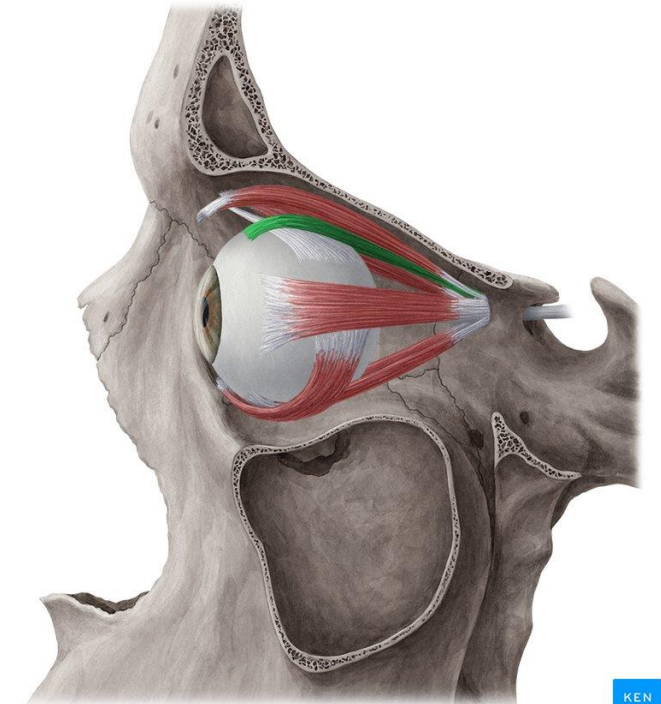
**Insertion:** Superior surface of eyeball just posterior to corneoscleral junction

**N. Supply:** *Oculomotor nerve*

**Action:** *Raises cornea upward and medially*



- Levator palpebrae superioris
- Superior oblique
- Inferior oblique
- Superior rectus
- Medial rectus
- Lateral rectus
- Inferior rectus



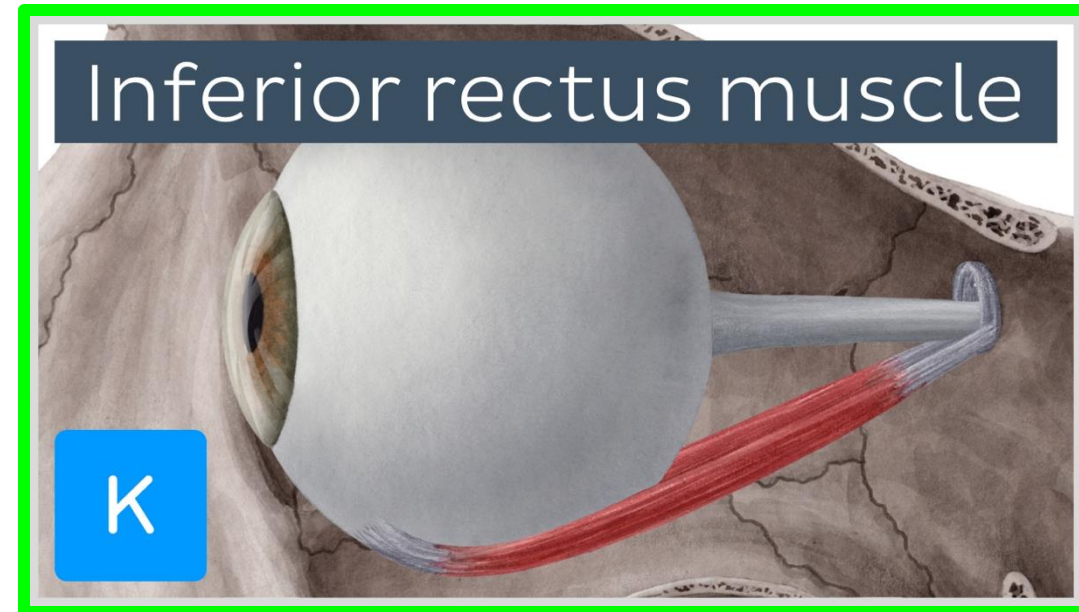
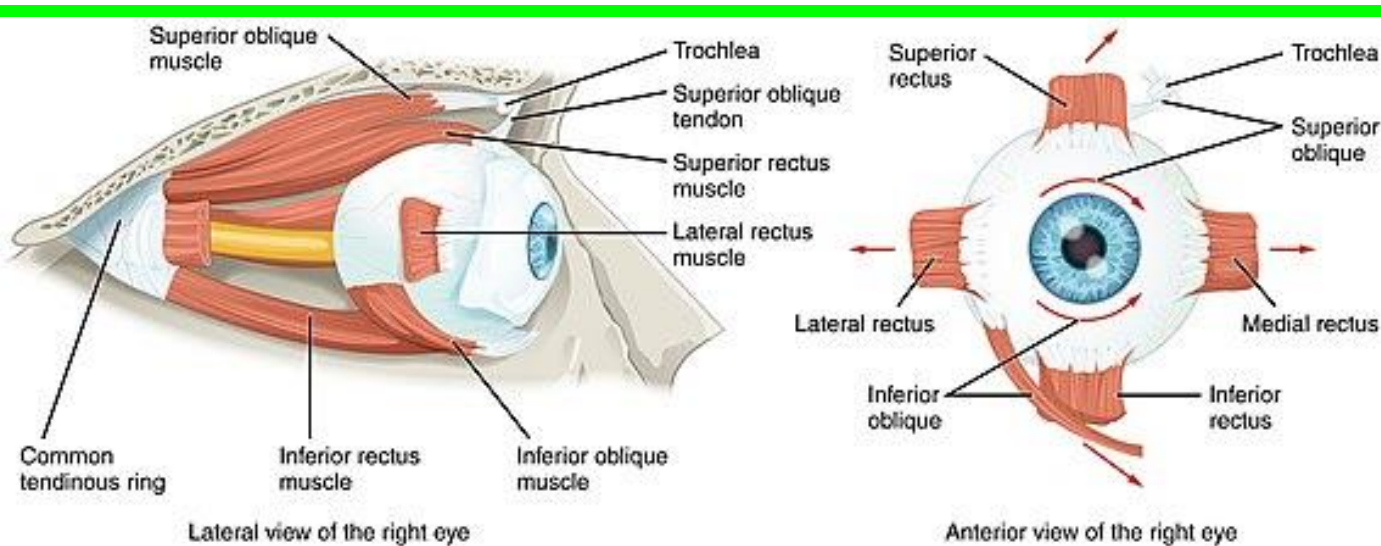
**Muscle:** *Inferior rectus*

**Origin:** common tendinous ring

**Insertion:** Inferior surface of eyeball just posterior to corneoscleral junction

**N Supply:** *Oculomotor nerve (3rd cranial nerve)*

**Action:** *Depresses cornea downward and medially*





# EXTRAOCULAR MUSCLES OF ORBIT

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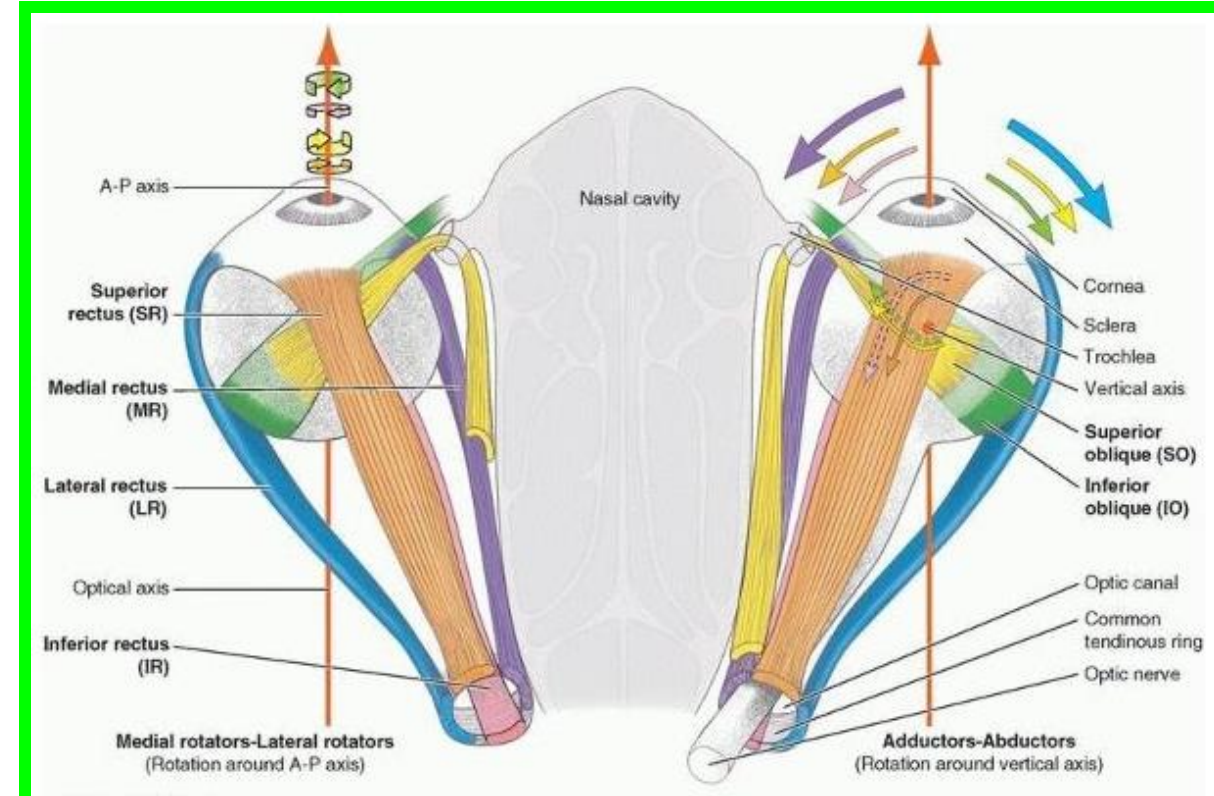
**Muscle:** *Medial rectus*

**Origin:** Common tendinous ring

**Insertion:** Medial surface of eyeball just posterior to corneoscleral junction

**N. Supply:** Oculomotor nerve (3rd cranial nerve)

**Action:** Rotates eyeball so that cornea looks medially





# EXTRAOCULAR MUSCLES OF ORBIT

Muscle: **Lateral rectus**

Origin: Common tendinous ring

Insertion: Lateral surface of eyeball just posterior to corneoscleral junction

N. Supply: **Abducent nerve (6th cranial nerve)**

Action: **Rotates eyeball so that cornea looks laterally**



# EXTRAOCULAR MUSCLES OF ORBIT

Muscle: **Superior oblique**

Origin: Posterior wall of orbital cavity

Insertion: Passes through pulley and is attached to superior surface of eyeball beneath superior rectus

N. Supply: **Trochlear nerve (4th cranial nerve)**

Action: **Rotates eyeball so that cornea looks downward and laterally**



# EXTRAOCULAR MUSCLES OF ORBIT

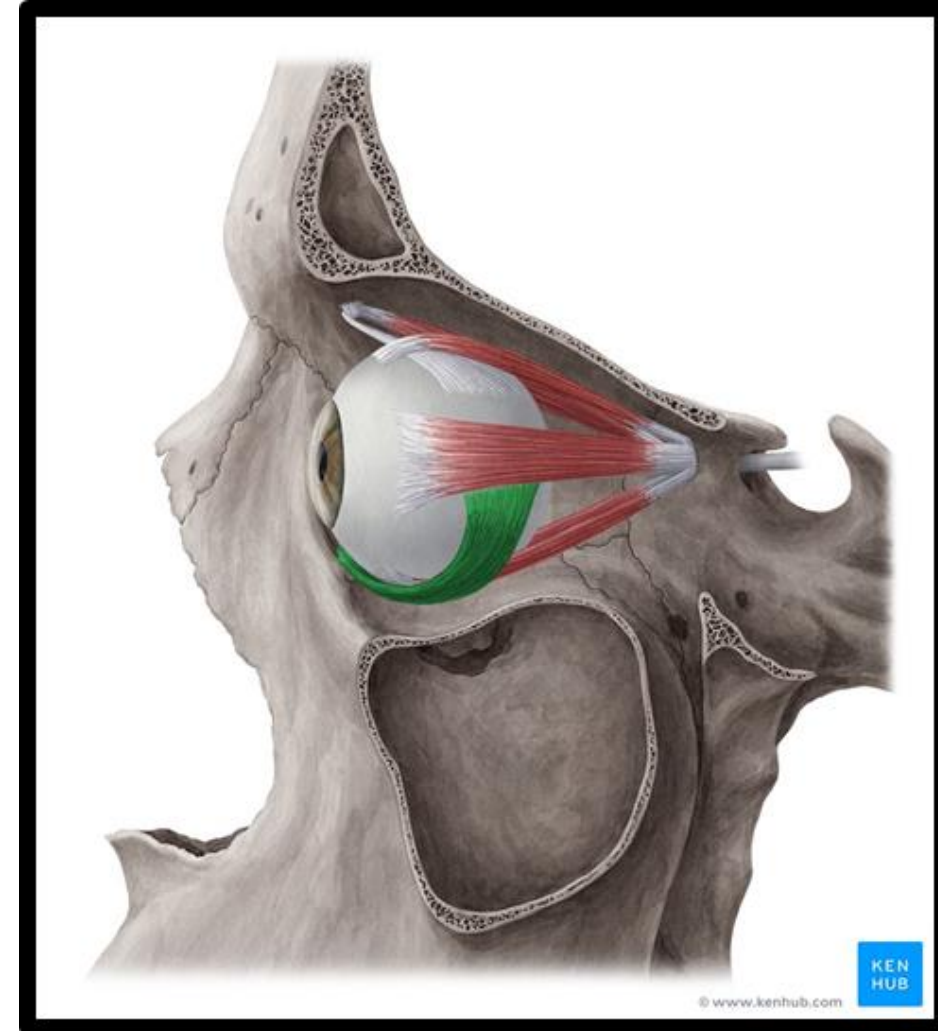
**Muscle:** *Inferior oblique*

**Origin:** Floor of orbital cavity

**Insertion:** Lateral surface of eyeball deep to lateral rectus

**N. Supply:** *Oculomotor nerve (3rd cranial nerve)*

**Action:** *Rotates eyeball so that cornea looks upward and laterally*





# EXTRAOCULAR MUSCLES OF ORBIT

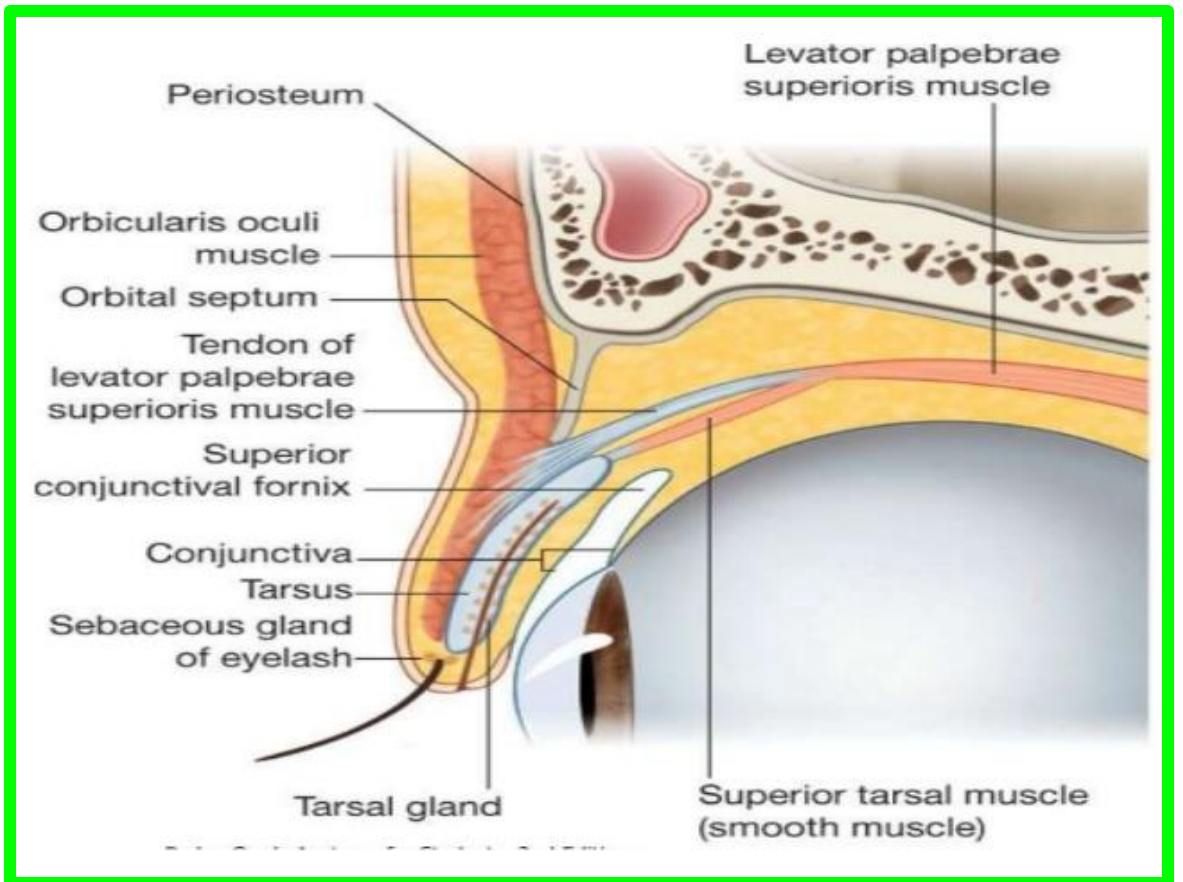
**Muscle:** *Levator palpebrae superioris*

**Origin:** Back of orbital cavity

**Insertion:** Anterior surface and upper margin of superior tarsal plate

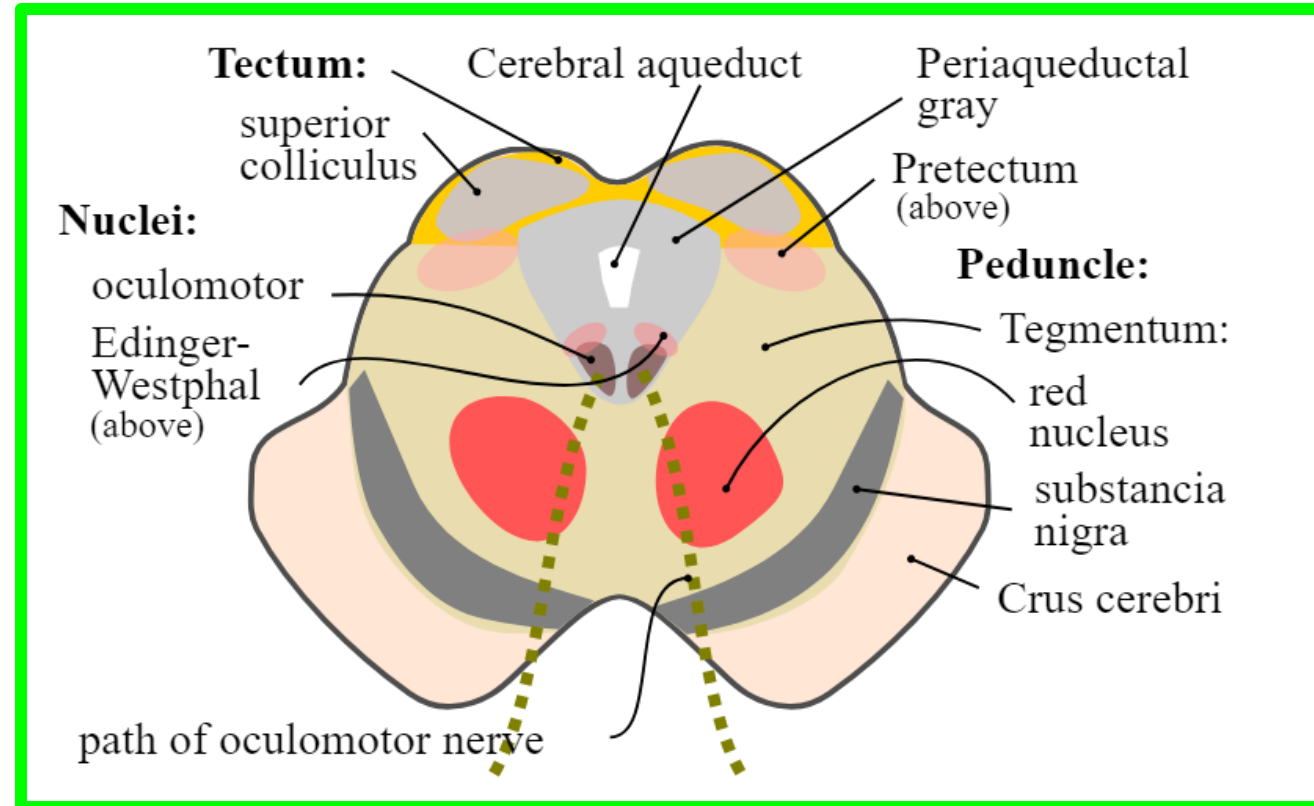
**N. Supply:** *Striated muscle* oculomotor nerve, *smooth muscle* sympathetic

**Action:** *Raises upper lid*



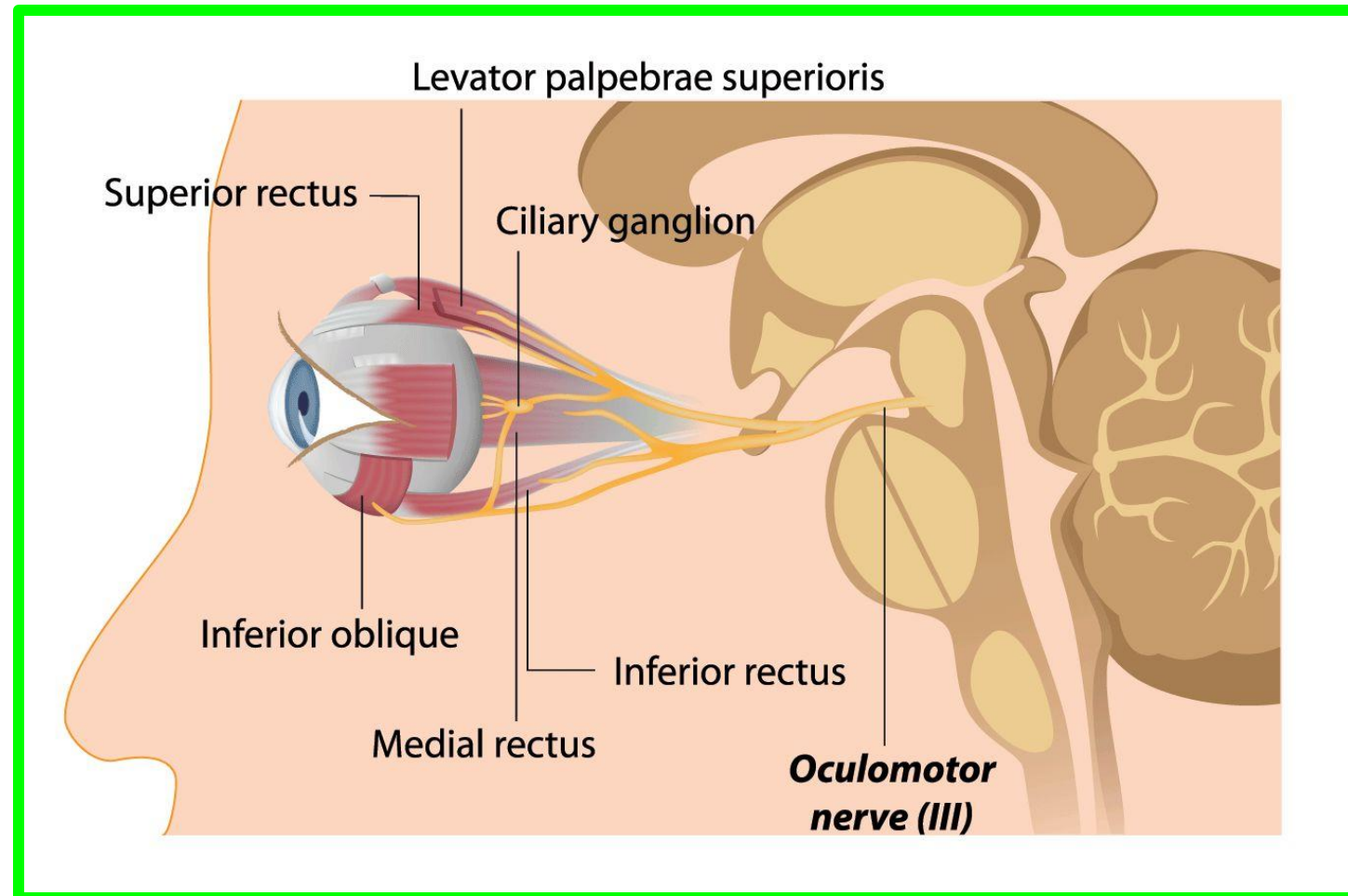
# OCULOMOTOR NERVE / (3<sup>rd</sup>) Cranial Nerve

- **Nucleus:** It lies in the midbrain and formed of;
  - A. **Motor nucleus:** It supplies all the extra ocular muscles except lateral rectus and superior oblique
  - B. **Edinger-westphal nucleus:** (Parasympathetic) to the constrictor pupillae muscle and ciliary muscle.



# OCULOMOTOR NERVE / (3<sup>rd</sup>) Cranial Nerve

- **Exit from the brain stem:** arises from the medial aspect of the cerebral peduncle in the inter-peduncular fossa.





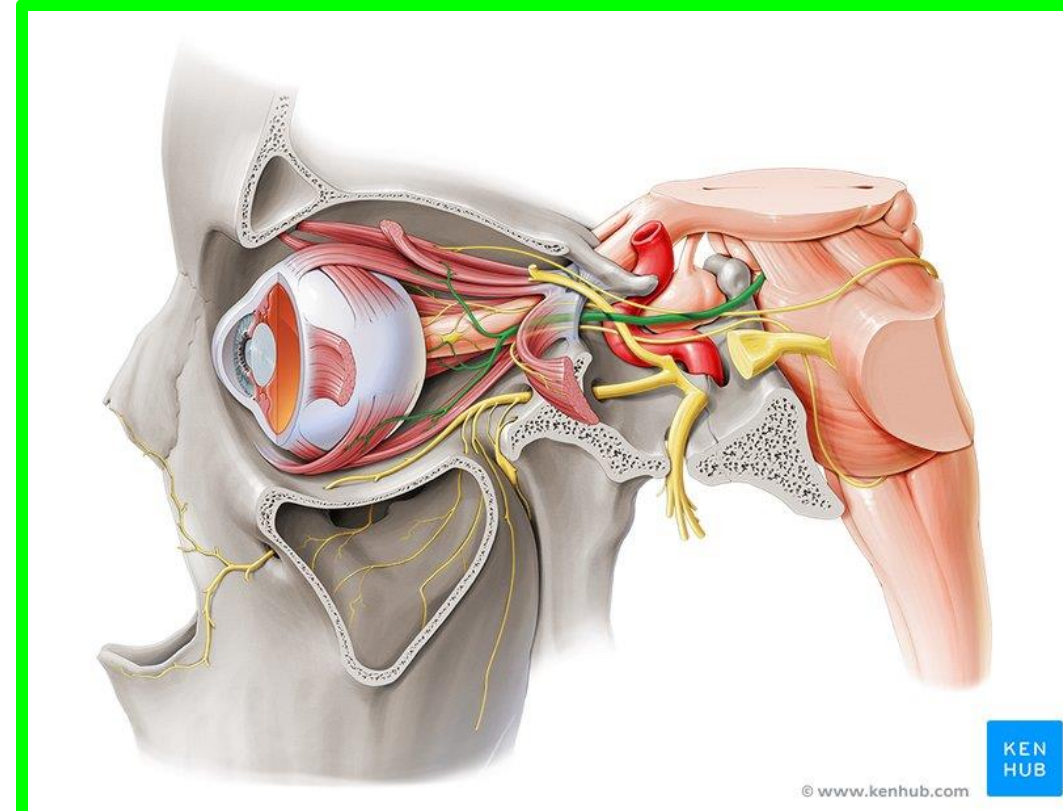
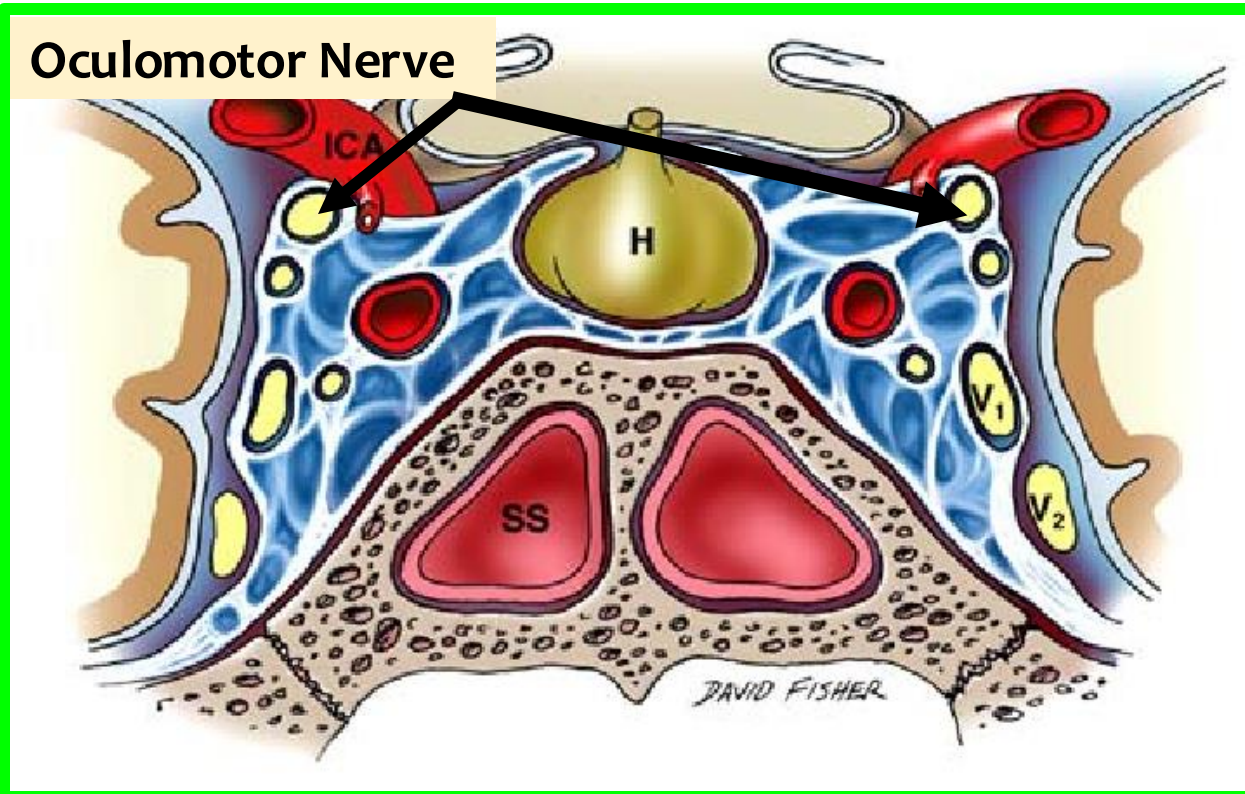
# OCULOMOTOR NERVE / (3<sup>rd</sup>) Cranial Nerve

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## ❖ Course :

- 1- It pierces the dura mater in front of the point of crossing of the free border with the attached border of the tentorium cerebelli.
- 2- It passes forwards in the lateral wall of **cavernous sinus** above **the trochlear nerve**.
- 3- Then it enters **the orbit** through **the superior orbital fissure** inside the tendinous ring where it divides into superior and inferior divisions:



# OCULOMOTOR NERVE / (3<sup>rd</sup>) Cranial Nerve

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## ❖ Branches:

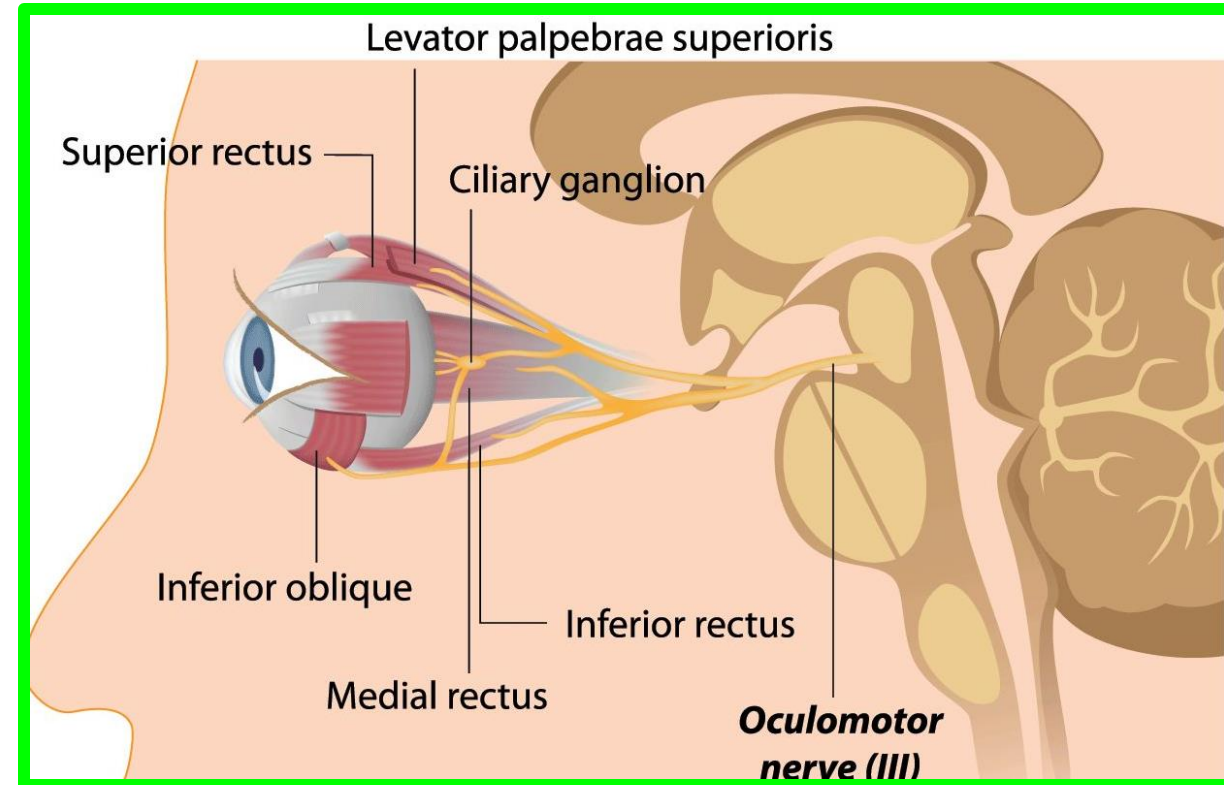
(a) The superior division supplies:

(1) Superior rectus (2) Levator palpebrae superioris.

(b) The inferior division supplies:

(1) inferior oblique (2) Inferior rectus (3) Medial rectus.

(c) The nerve to inferior oblique gives a parasympathetic root to **the ciliary ganglion** to supply the **constrictor pupillae muscle** and **ciliary muscle**.



# OCULOMOTOR NERVE / (3<sup>rd</sup>) Cranial Nerve

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## ❖ Applied anatomy: injury of the nerve

1- Paralysis of the levator palpebrae superioris leading to **ptosis**.

2- **Squint**.



Squint Eye (Strabismus)

Normal



(Esotropia)



eye turns inwards

(Exotropia)



eye turns outwards

(Hypotropia)



eye turns downwards

(Hypertropia)



eye turns upwards

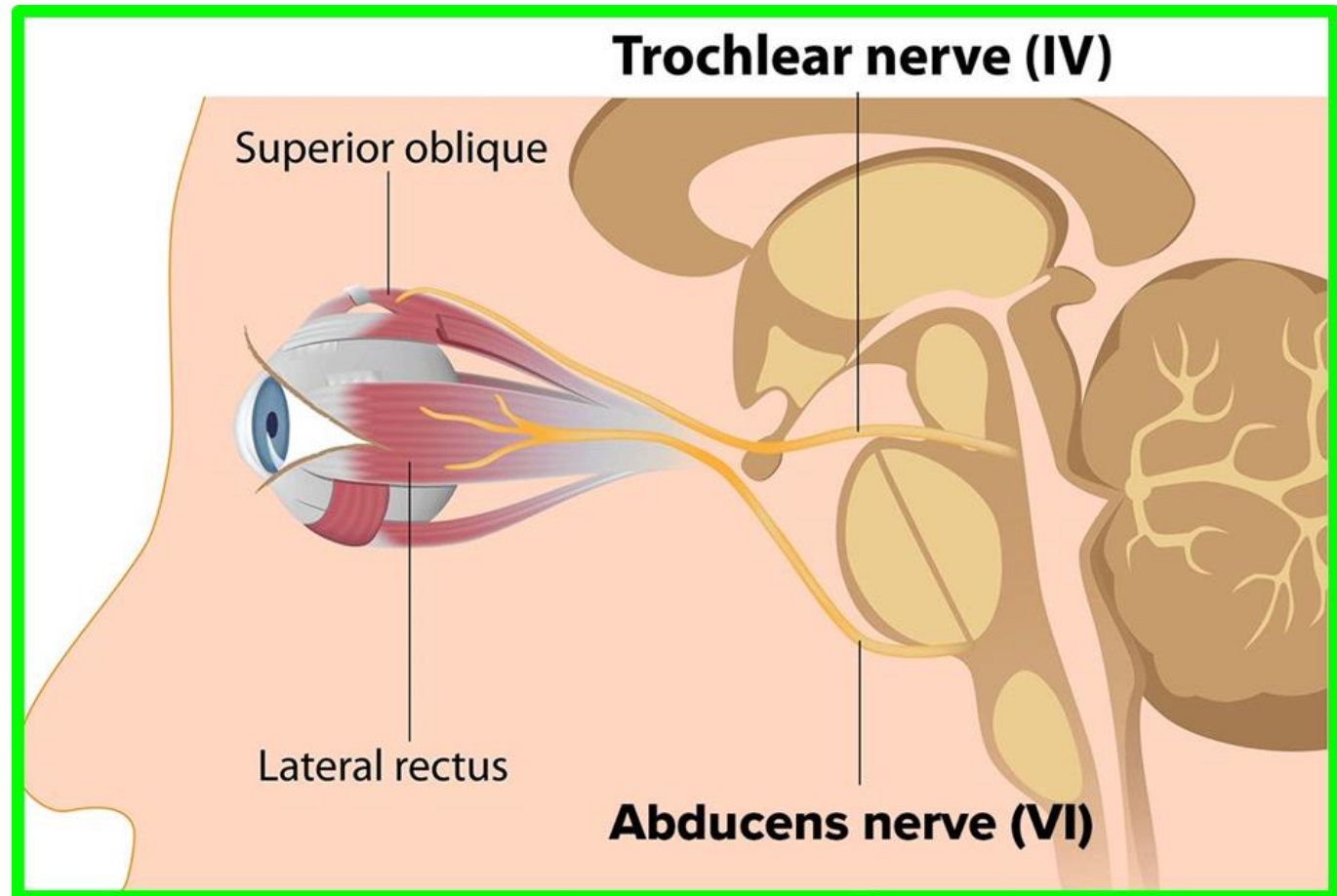
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# TROCHLEAR NERVE / (4<sup>th</sup>) Cranial Nerve

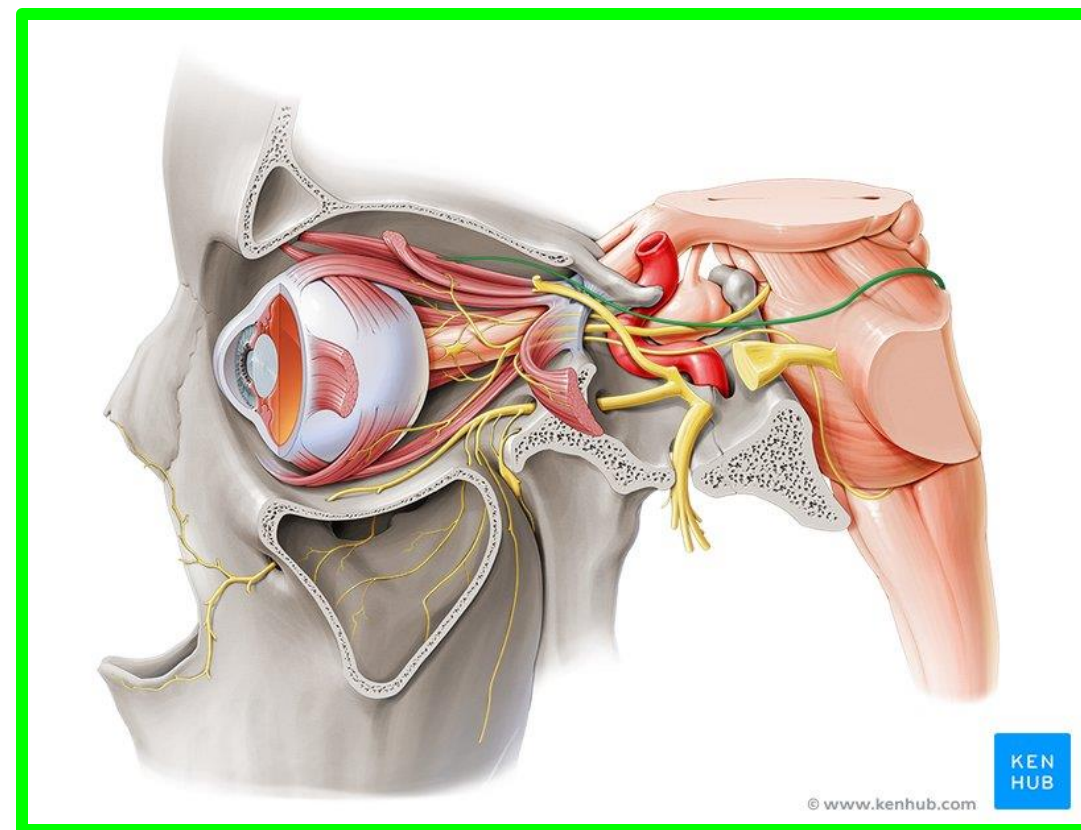
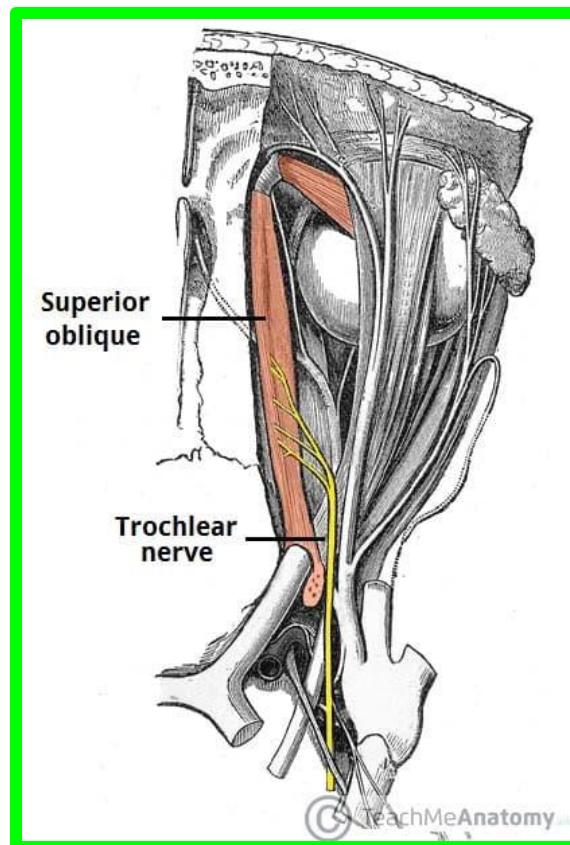
- ❖ **Nucleus:** Motor nucleus in the midbrain.
- ❖ **Exit:** arises from the posterior aspect of midbrain.



# TROCHLEAR NERVE / (4<sup>th</sup>) Cranial Nerve

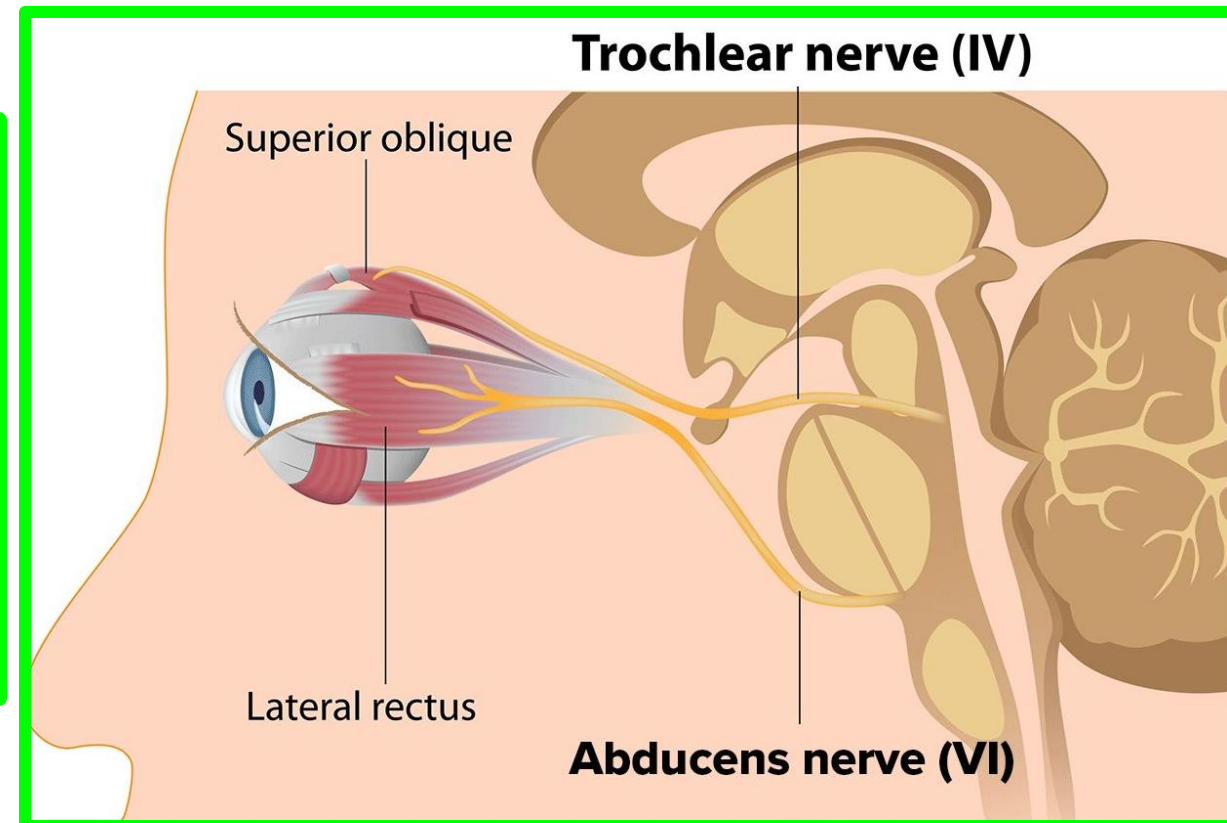
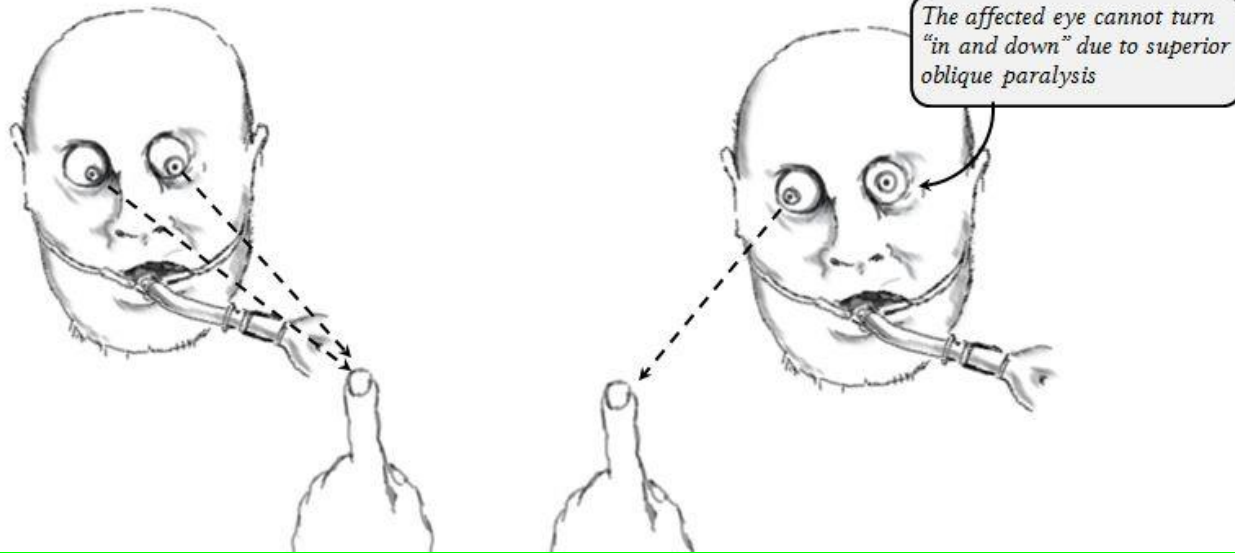
## ❖ Course:

- (1) It turns forwards around the midbrain.
- (2) It pierces the dura mater at the point of decussation of the tentorium cerebelli.
- (3) It passes forwards in the lateral wall of cavernous sinus.
- (4) Finally it enters the orbit through the superior orbital fissure outside the tendinous ring.



# TROCHLEAR NERVE / (4<sup>th</sup>) Cranial Nerve

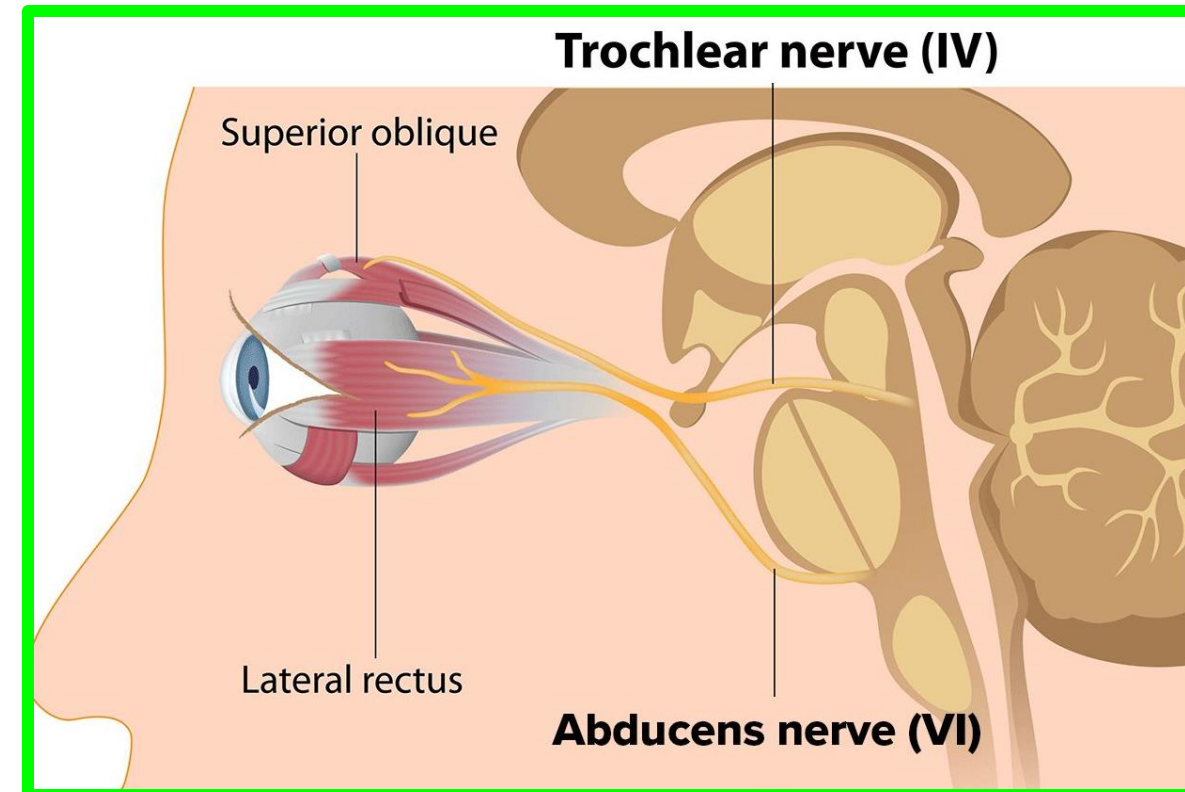
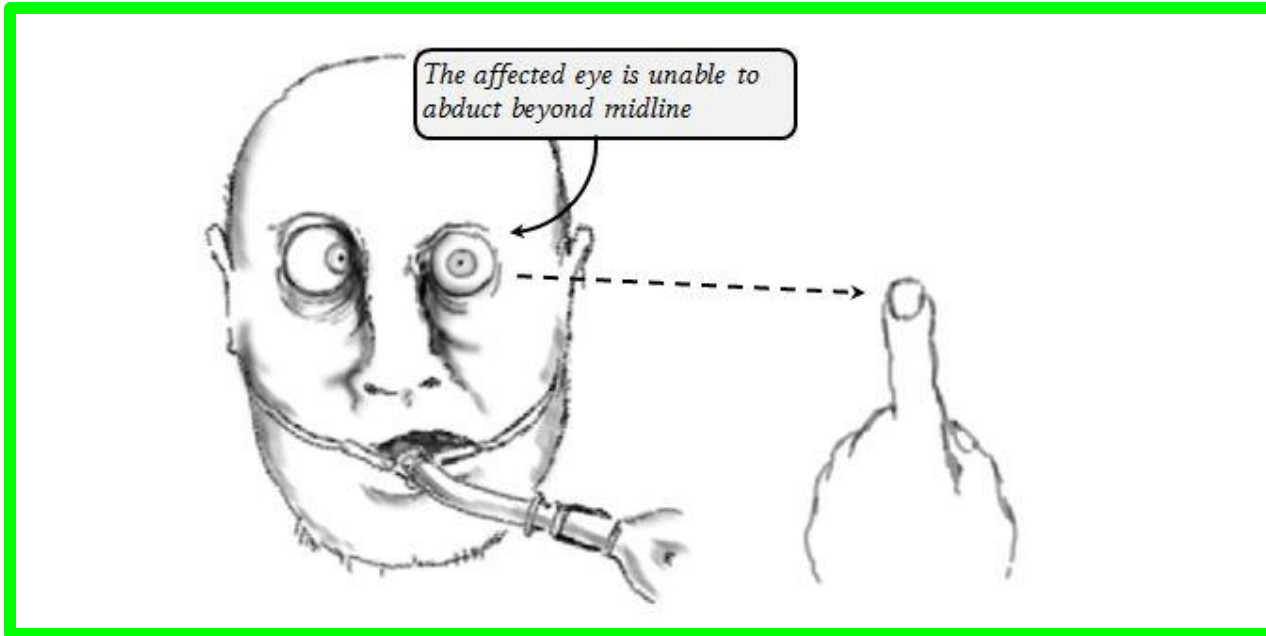
- ❖ **Branches:** it supplies the superior oblique muscle.
- ❖ **Applied anatomy;** injury of the trochlear nerve the cornea cannot be directed downwards and laterally.





# ABDUCENT NERVE (6<sup>th</sup>) / Cranial Nerve

- ❖ **Nucleus:** motor nucleus in the pons.
- ❖ **Exit:** from the groove between lower border of the pons and upper border of the pyramid.
- ❖ **Applied anatomy:** Abducent nerve Lesion: leads to medial deviation of the cornea.



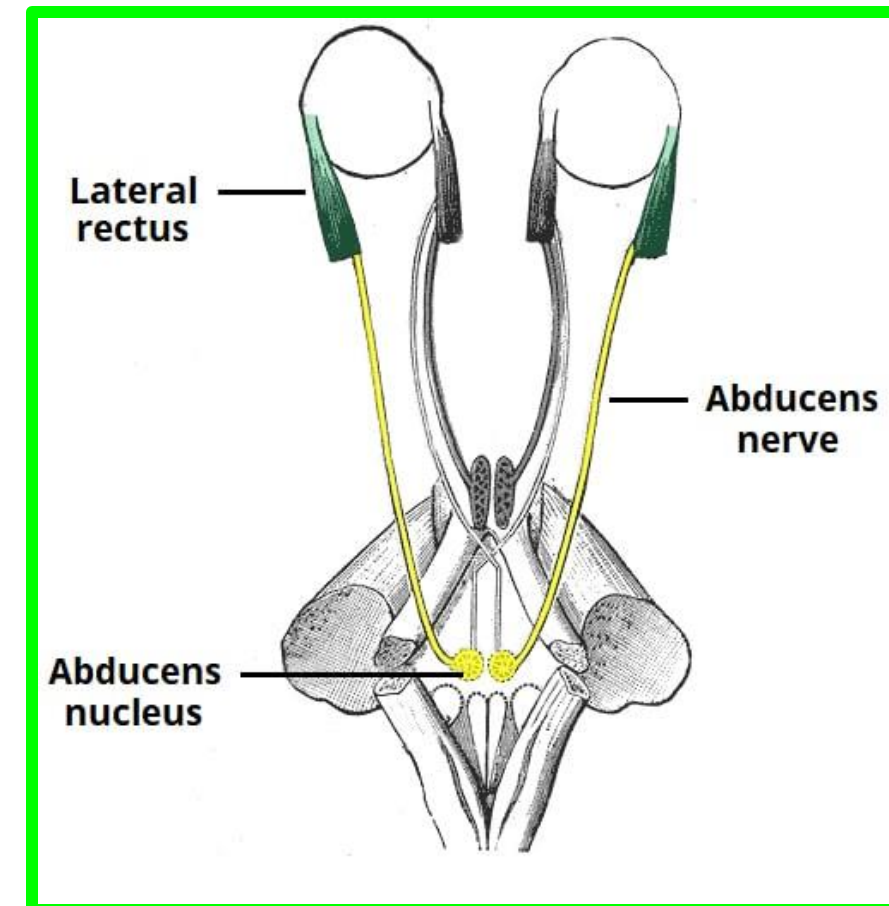
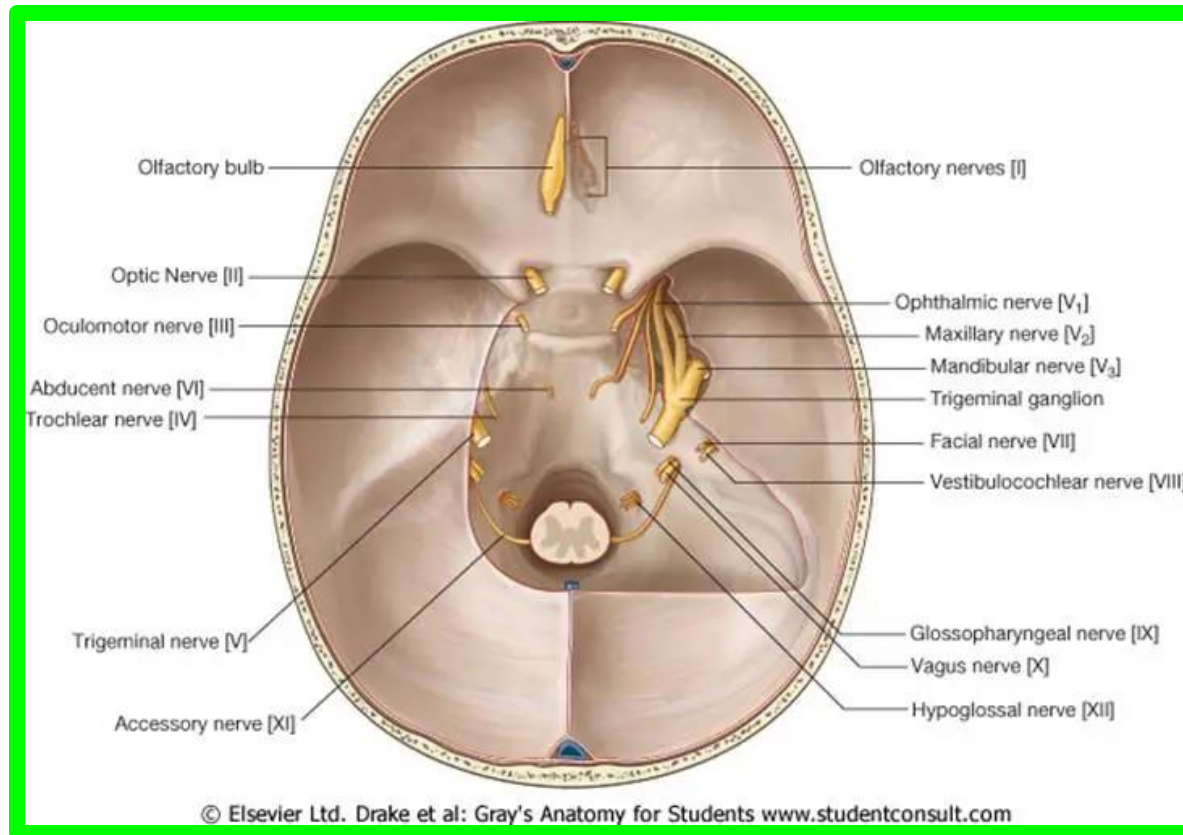
# ABDUCENT NERVE (6<sup>th</sup>) / Cranial Nerve

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## ❖ course and relations :

- (1) It pierces the dura at the apex of the petrous part of the temporal bone.
- (2) It enters **the cavernous sinus** infero-lateral to the internal carotid artery.
- (3) Then it enters the orbit through **the superior orbital fissure** inside the tendinous ring.
- (4) It supplies **the lateral rectus muscle**.





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