

January 31, 2024 - Dr. Krebs (claudia.krebs@ubc.ca)

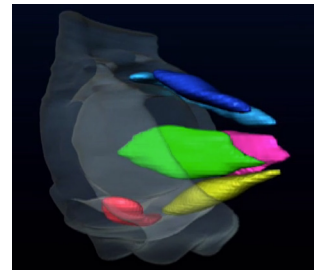
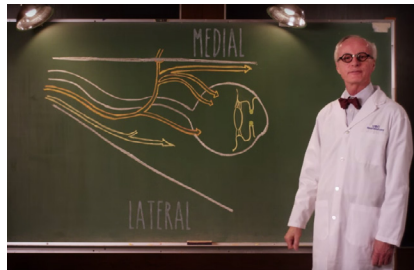
Objectives:

1. Describe the bony anatomy of the orbit.
2. Describe the location and orientation of the extraocular muscles.
3. Localize the three cranial nerves that innervate the extraocular muscles (CN II, IV, VI).
4. Compare the course of sympathetic and parasympathetic nerves to the eye.
5. Relate the arterial supply to the eye to its susceptibility to clinical presentations such as amaurosis fugax.
6. Discuss how the venous drainage from the orbit communicates with other compartments of the skull and its clinical implications.
7. Describe the location of the lacrimal apparatus and the drainage of tears and its importance for the health of the eye.

Videos:

(requires CWL login)

Volume 4 - Head & Neck
The Eye and its Surroundings
4.10.1 - Bony anatomy
4.10.3 - Rectus muscles
4.10.4 - Oblique muscles
4.10.6 - Lacrimal apparatus



3D specimens:

Modules:

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Bones of Orbit

- Sphenoid
- Maxilla
- Zygomatic
- Frontal
- Ethmoid
- Lacrimal
- Nasal

Openings into Orbit

- Optic canal
- Superior orbital fissure
- Inferior orbital fissure
- Supraorbital foramen
- Infraorbital foramen
- Fossa of lacrimal sac

Which space in the skull would a fracture in the floor of the orbit communicate with?

Which space in the skull would a fracture in the medial wall of the orbit communicate with?

Anterolateral View of Skull

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Muscles

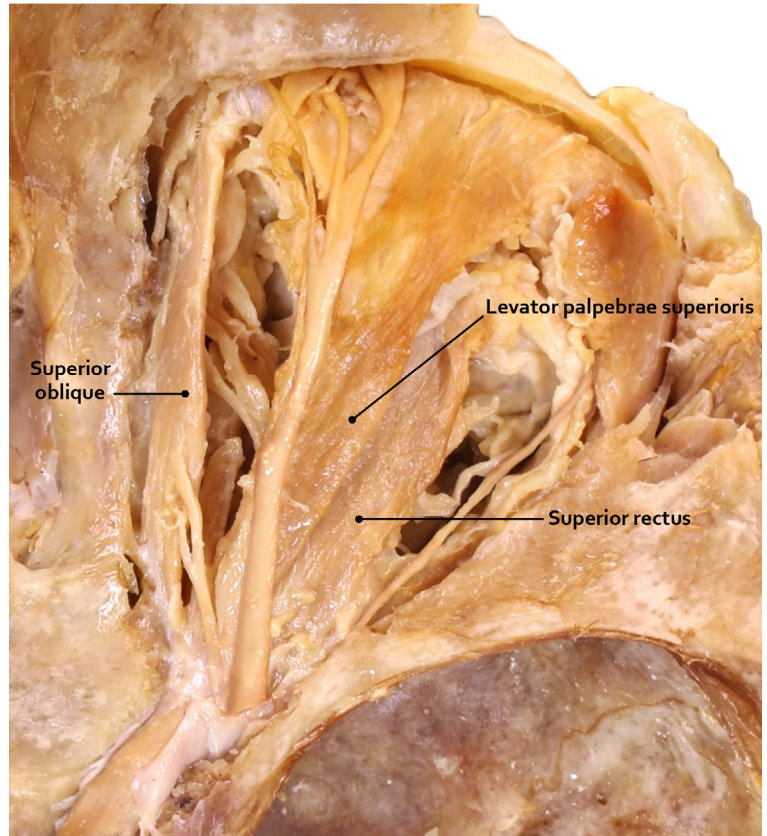
Extrinsic ocular muscles:

Superior / Inferior oblique

Superior / Inferior rectus

Medial / Lateral rectus

Levator palpebrae superioris



Superior View of Orbit

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Superior View

Lateral View

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Anterior View of Eyeball and Interior Orbit
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Nerves

Optic (II)

Ophthalmic branches (V₁)

Lacrimal

Frontal

- Supratrochlear
- Supraorbital

Nasociliary

Infratrochlear

- Long ciliary
- Posterior & Anterior ethmoidal
- (Ganglionic branches to ciliary ganglion)

Oculomotor (III)

Superior division

- to Superior rectus/Levator palpebrae superioris

Inferior division

- to Medial rectus
- to Inferior rectus
- to Inferior oblique

- (Parasympathetic root to ciliary ganglion)

Trochlear (IV)

Abducens (VI)

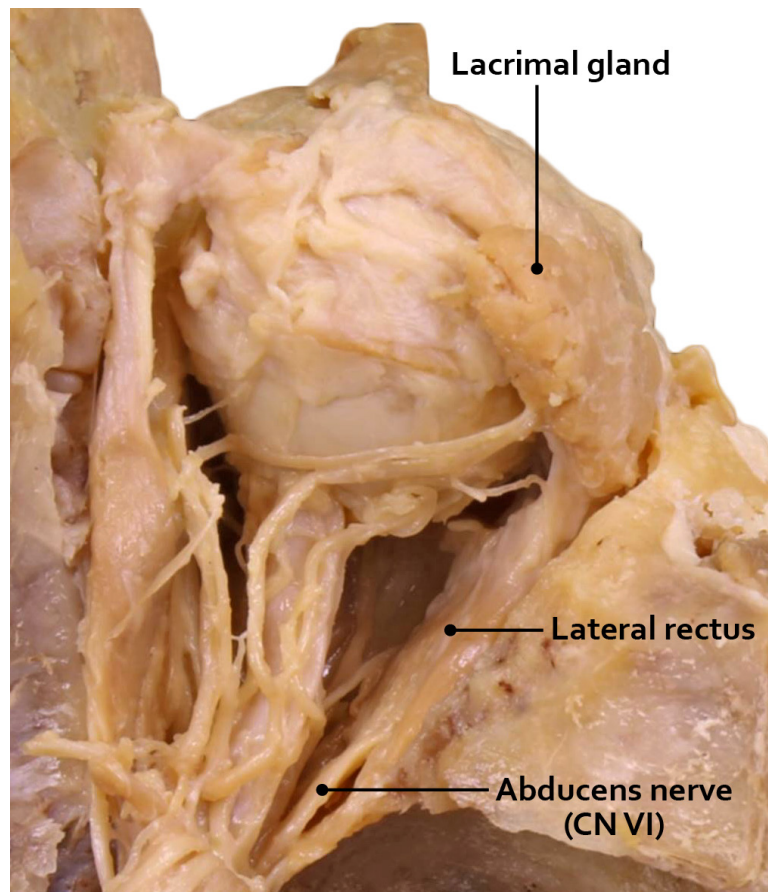
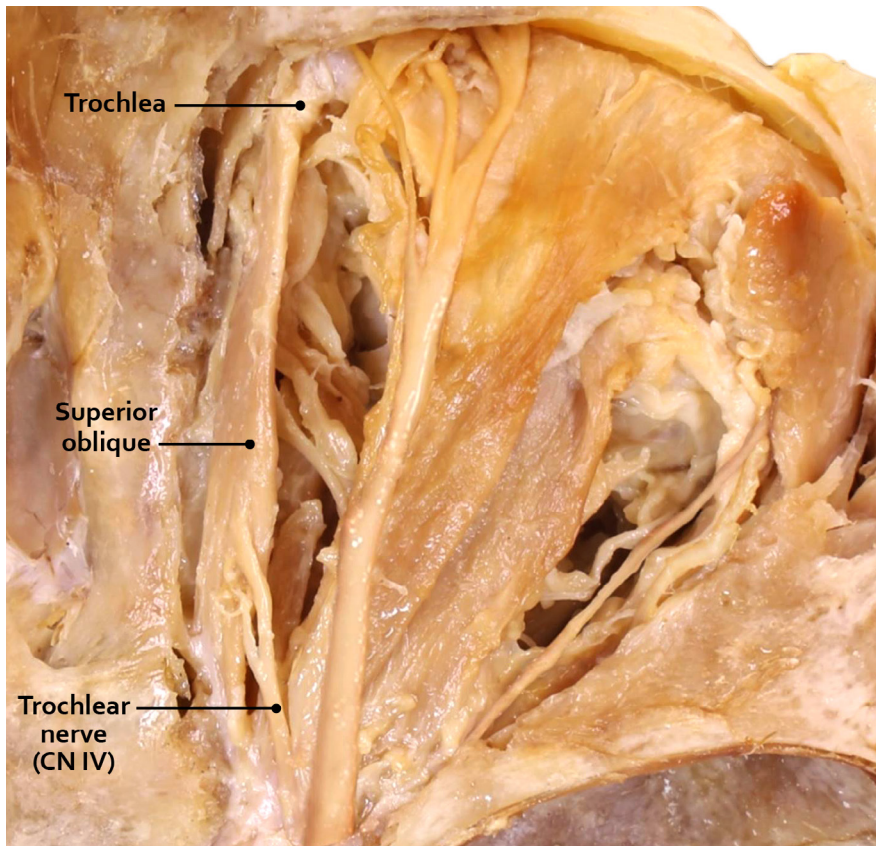
Superior View of Orbital Nerves

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Superior View of Orbit

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CN IV and CN VI in Superior Orbit
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Follow the parasympathetic fibres that enter the orbit with CN III to the constrictor pupillae.

Where are the preganglionic cell bodies of the parasympathetic fibres? Where is the ganglion? How do fibres travel from the ganglion to the orbit?

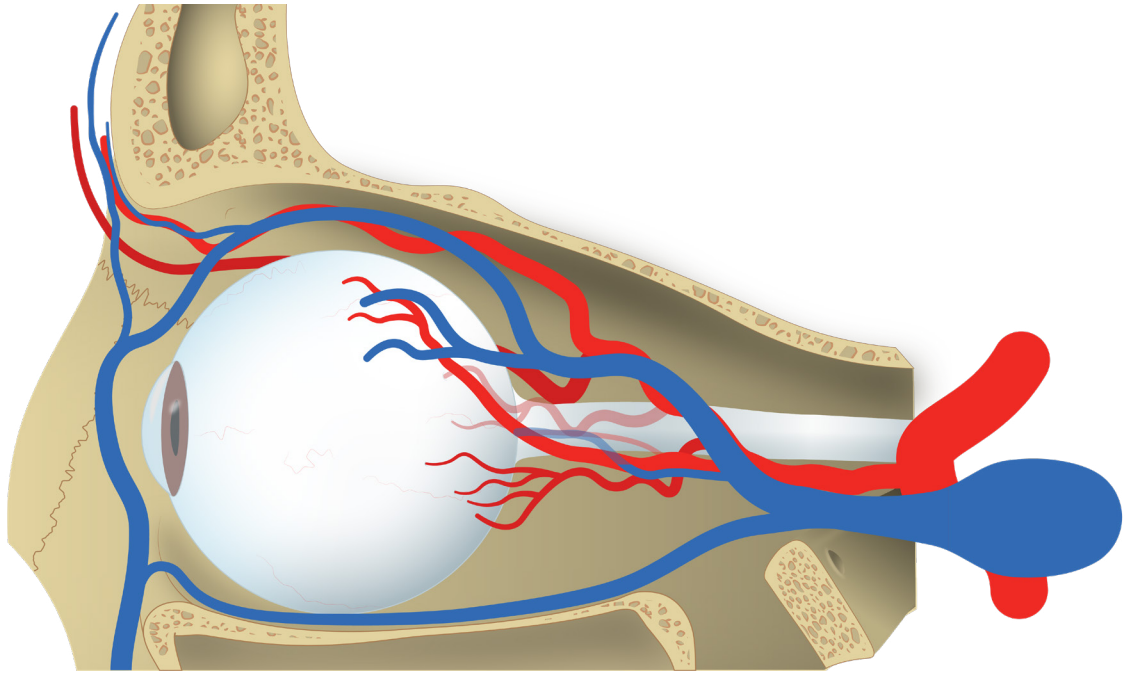
Follow the sympathetic fibres that enter the orbit to the dilator pupillae.

Where are the preganglionic cell bodies of the sympathetic fibres? Where is the ganglion? How do the postganglionic fibres reach the orbit?

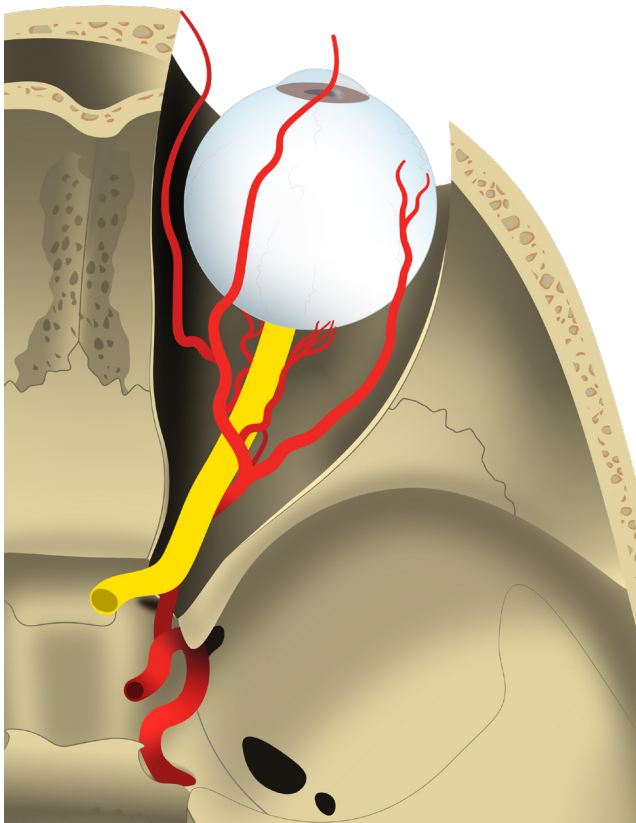
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Vessels

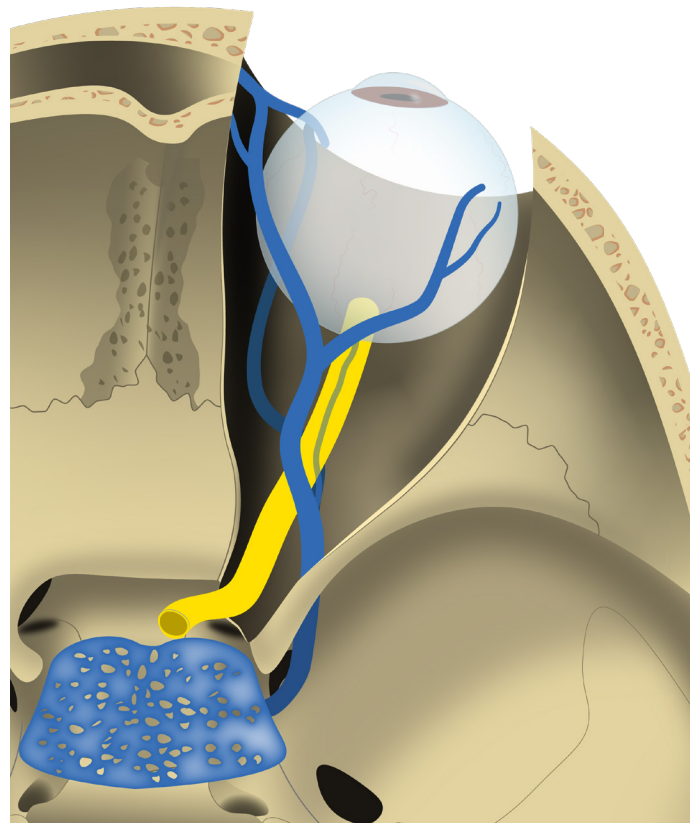
- Ophthalmic artery
- Ophthalmic veins



Ophthalmic Artery & Vein in Lateral View



Ophthalmic Artery



Superior View

Ophthalmic Vein

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Ophthalmic Vessels in Superior Orbit
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What is amaurosis fugax? What about the anatomy of the ophthalmic artery makes it vulnerable?

The orbital veins are the largest emissary veins. What is the functional / clinical significance of this?

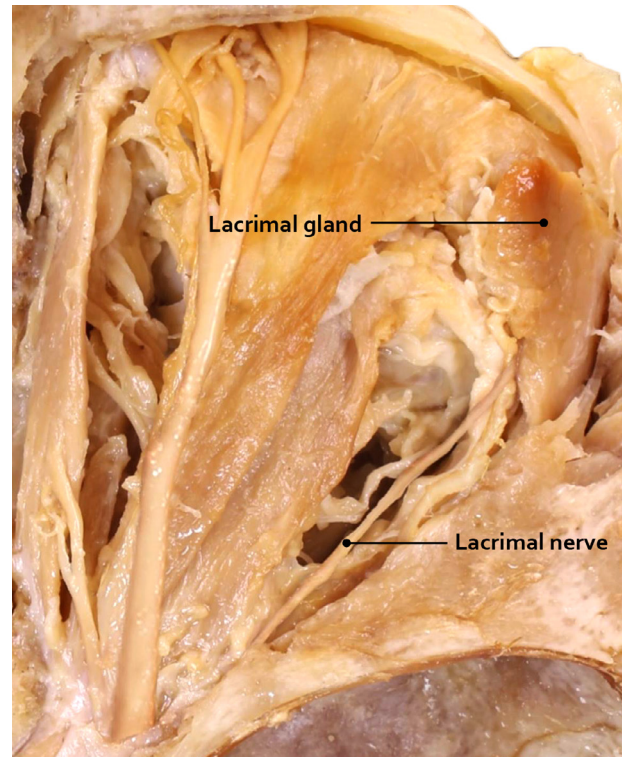
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Glands of Orbit/Eyelids

Lacrimal

Drainage to inferior meatus of nose via:

- Puncta lacrimalia/Lacrimal papilla
- Canaliculi
- Lacrimal sac
- Nasolacrimal duct



Superior Orbit

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Lacrimal System

Explain why we often have a runny nose after a big cry.

What is the innervation of the lacrimal gland?

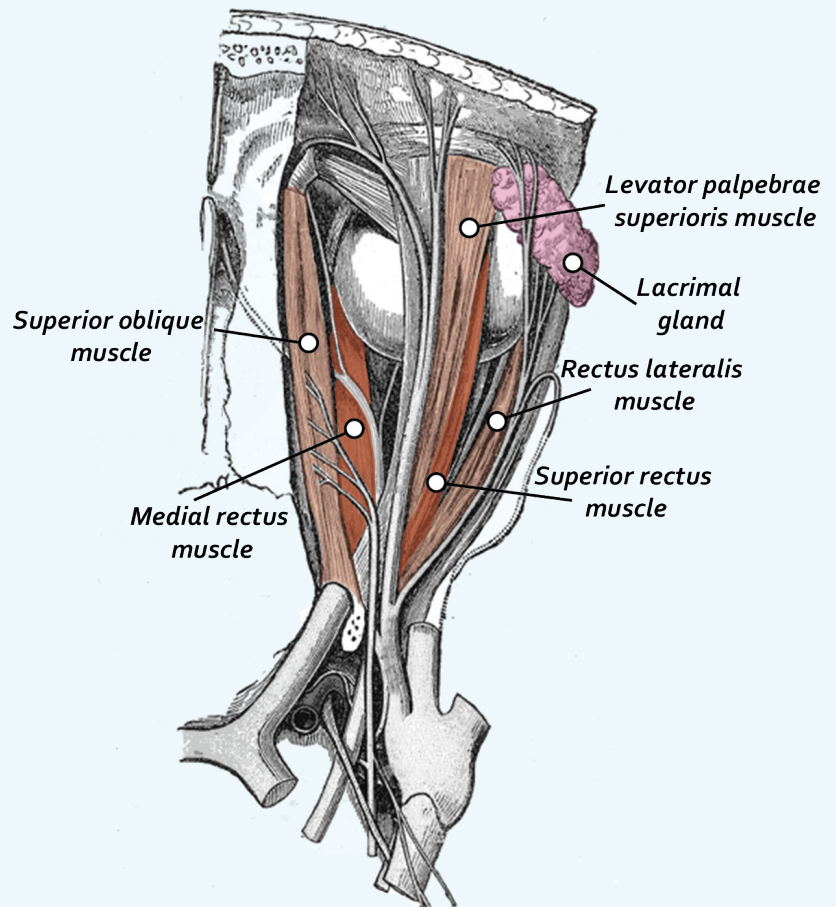
LAB 3 DISSECTOR

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Notes:

- We will dissect the orbit through a superior approach.
- The orbit is filled with fat which fills the space between all structures within the orbit.
- Pick the fat out with a small delicate forceps, careful to preserve the delicate nerves that run within it.

1. Strip the dura from the anterior cranial fossa
2. Use your chisel and bone forceps to break through the roof of the orbit
3. Trace the frontal nerve through the superior orbital fissure - it will divide into the supratrochlear nerve and the supraorbital nerve
4. Expose the levator palpebrae superioris, detach it anteriorly
5. Expose the small lacrimal nerve from the superior orbital fissure to the lacrimal gland
6. Expose the superior rectus muscle and detach it anteriorly
7. Expose the superior oblique muscle
 - Try to see the cranial nerves that innervate the extraocular muscles from their inferior side
8. Expose the lateral and the medial rectus muscles
 - See the optic nerve without disturbing the structures above it



LAB 3 DISSECTOR

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9. Follow the nasociliary nerve into the orbit, it will run from lateral to medial over the optic nerve at the level of the lateral and medial rectus muscles.
- The long ciliary nerves come off the nasociliary nerve as it crosses the optic nerve
 - The anterior ethmoidal nerve will branch off medially into the nasal cavity
 - Find the abducens nerve on the medial side of the lateral rectus muscle

10. Follow the oculomotor nerve from the superior orbital fissure as it divides into a superior and an inferior division.

11. Find the parasympathetic ciliary ganglion – it is very small and located posteriorly in the orbit – about 1cm anterior to the apex of the orbit. Short ciliary nerves connect the ciliary ganglion with the eyeball.

12. Follow the ophthalmic artery from the internal carotid into the orbit.

13. Expose the lacrimal gland in the anterior - superior - lateral aspect of the orbit.

