Relations and structures passing through orbit

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Objectives

- Identify the foramina, fissures, and fossae associated with the orbit and what are the structures transmitted through these openings.

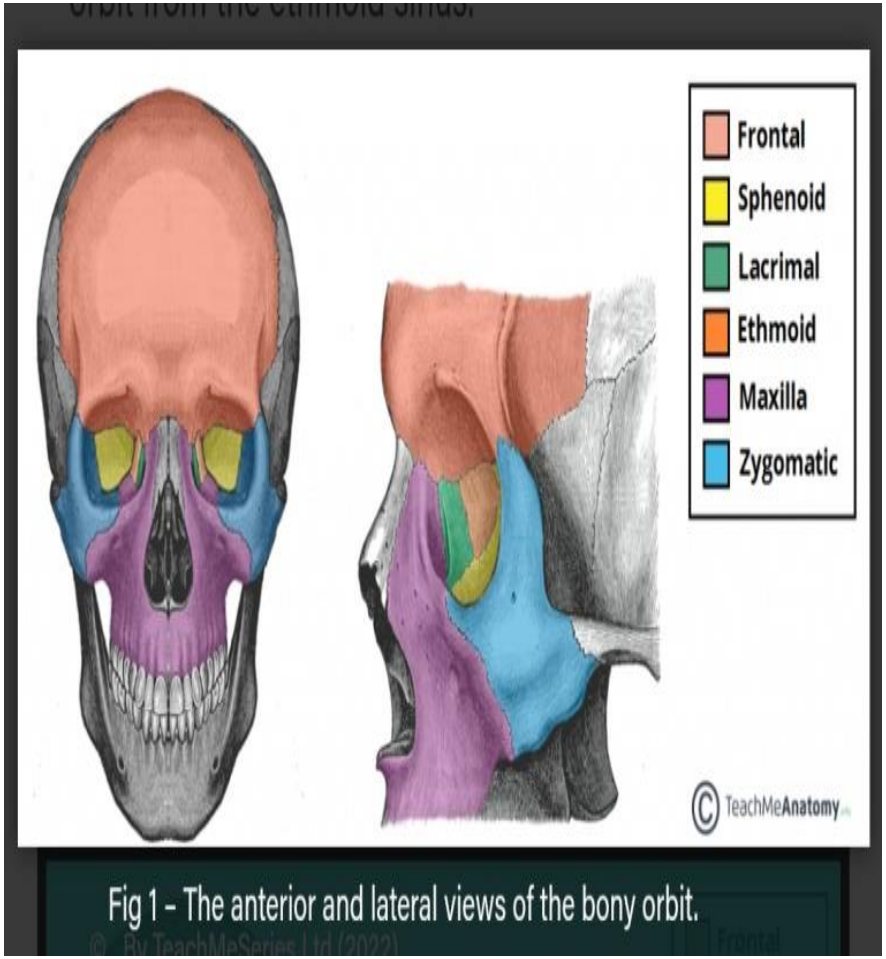
Contents

- Extraocular Muscles: they are responsible for movement of eyeball and superior eyelid.
- Eyelids
- Nerves
- Blood vessels
- Any empty space in orbit is filled by orbital fat.
- Fascia
- Lacrimal apparatus

Bones of the Orbit

It is made of seven bones.

1. Frontal
2. Maxilla
3. Zygomatic
4. Palantine
5. Ethmoid
6. Lacrimal
7. Sphenoid



Anatomical relations

- **Roof**:

Formed by frontal bone and lesser wing of sphenoid. Frontal bone separates its from anterior cranial fossa.

- **Floor:**

formed by maxilla, palatine and zygomatic. Maxilla separates it from maxillary sinus.

- **Medial wall**

  Formed by ethmoid, maxilla, lacrimal and sphenoid bones. Ethmoid none separates it from ethmoid sinus.

- **Lateral wall:**

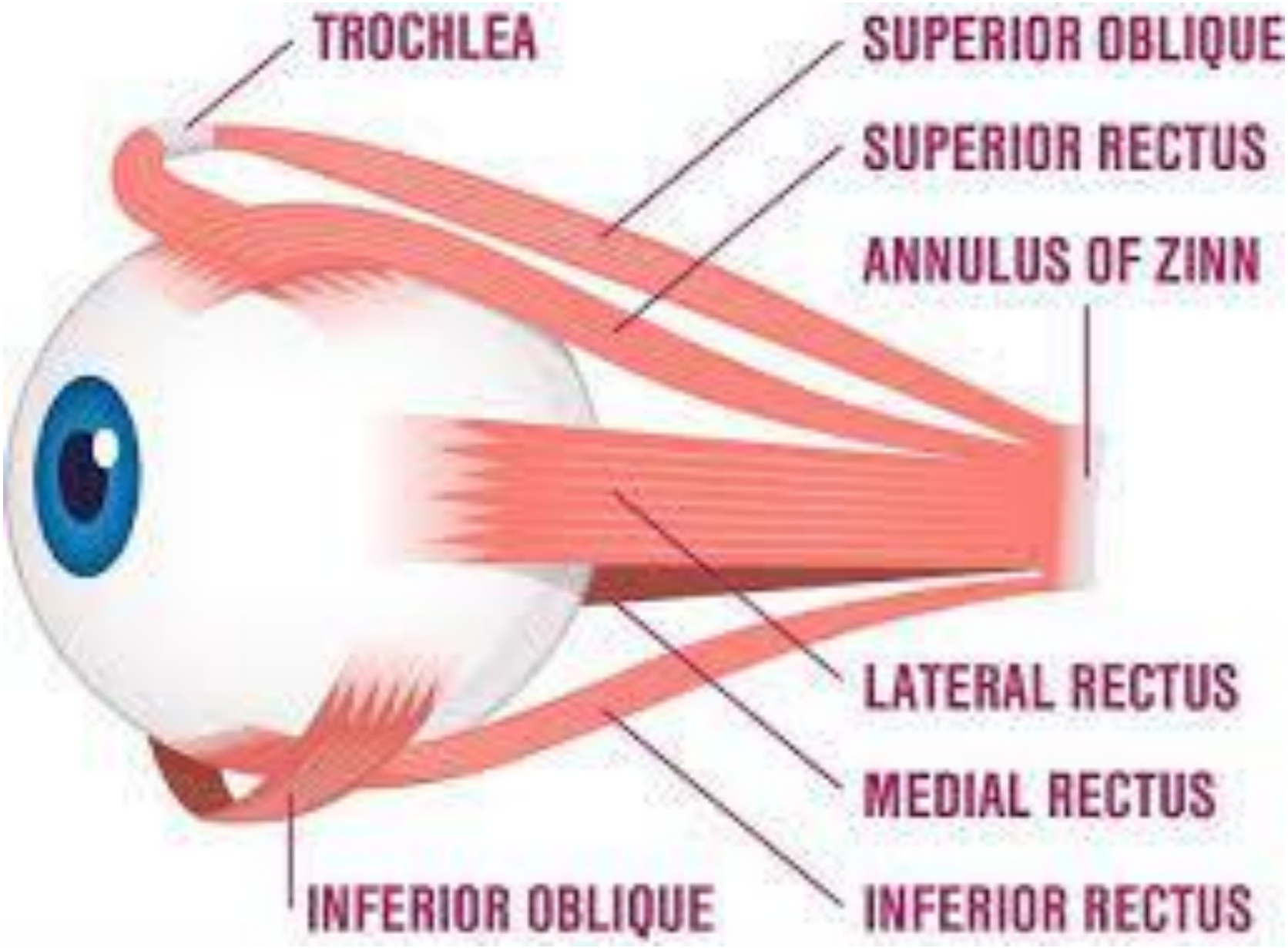
  Formed by zygomatic bone and greater wing of sphenoid.

- **Apex:**

  located at opening of optic canal, optic foramen.

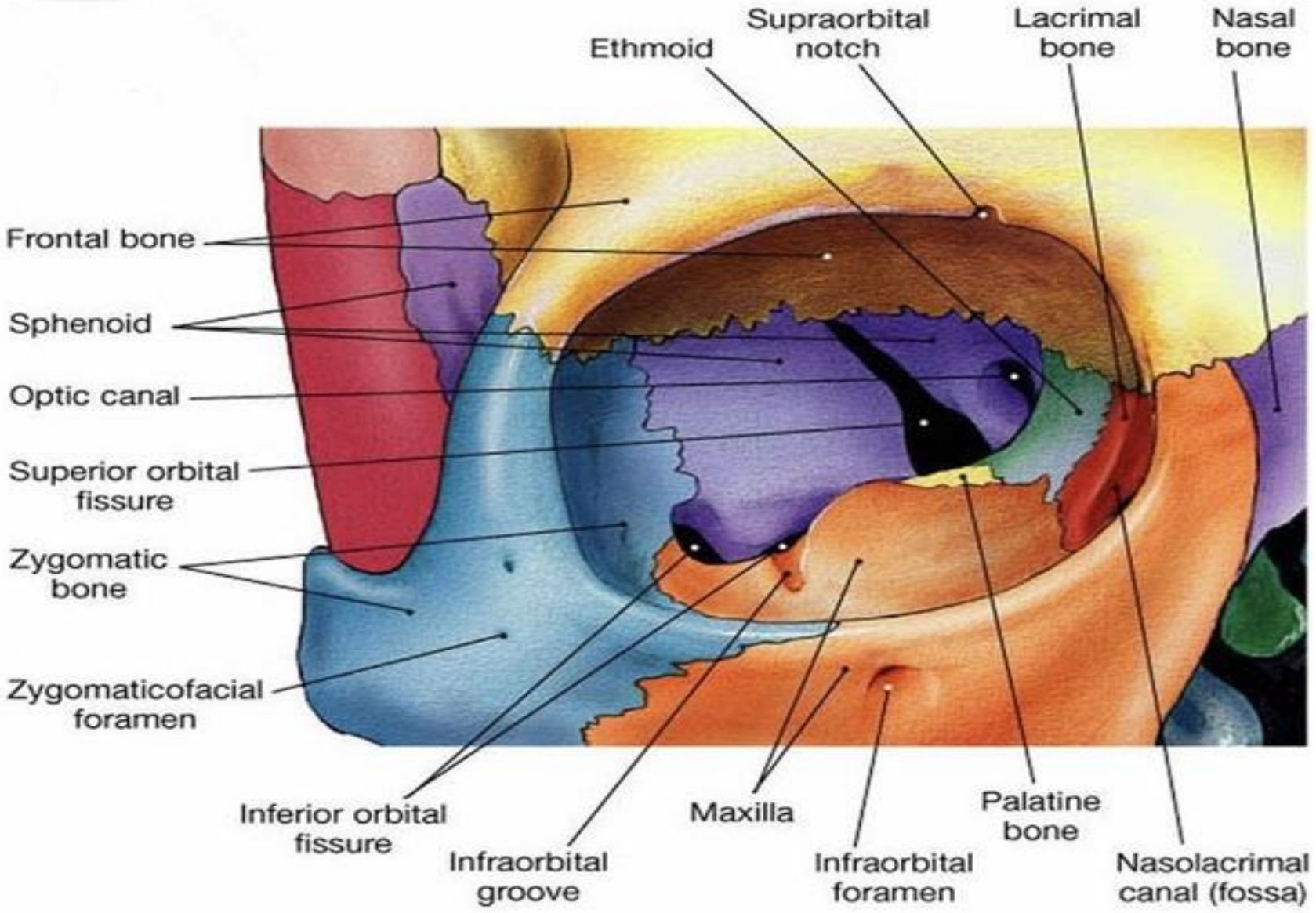
- **Base:**

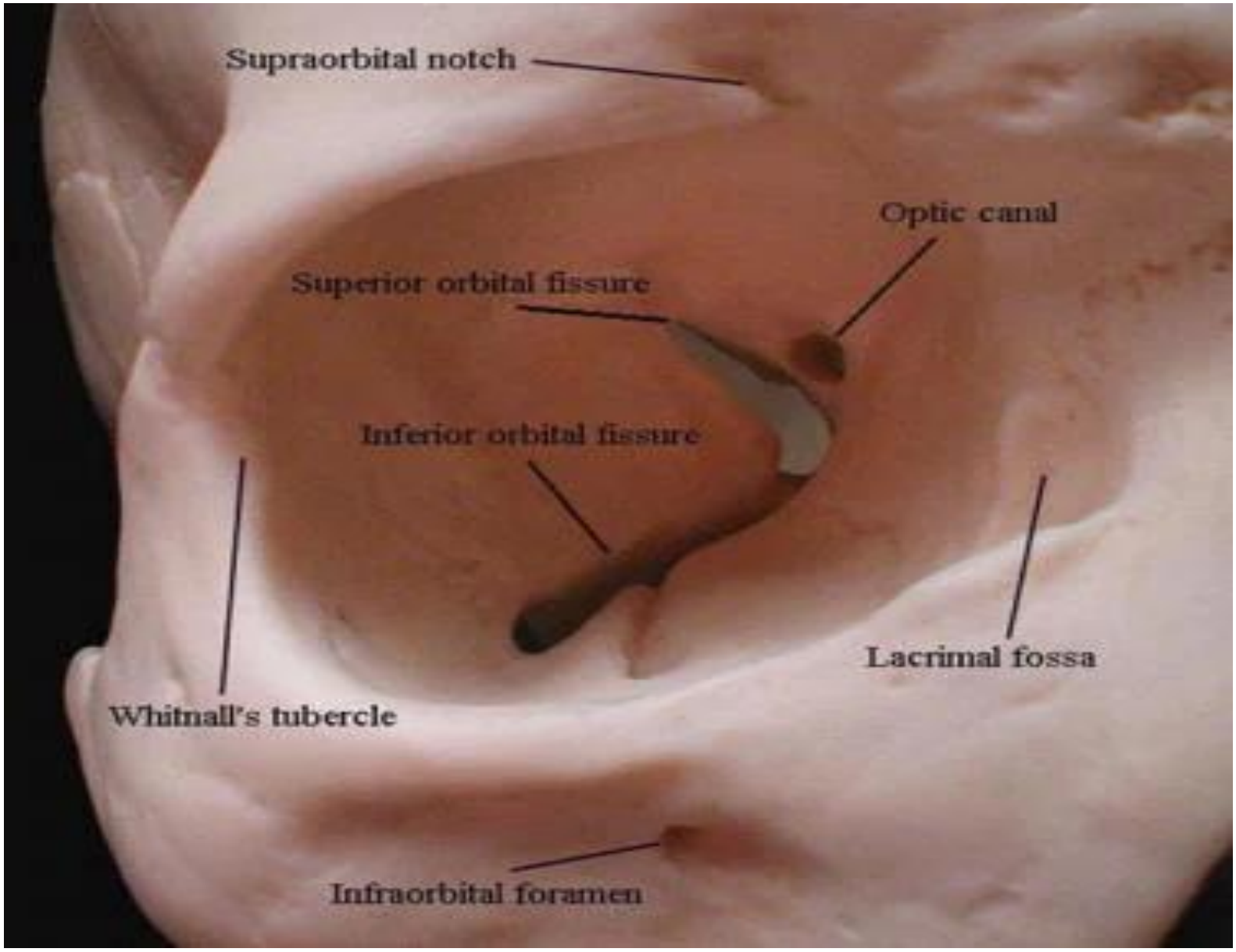
  Opens out into face and is bounded by eyelids. Also called optic rim.

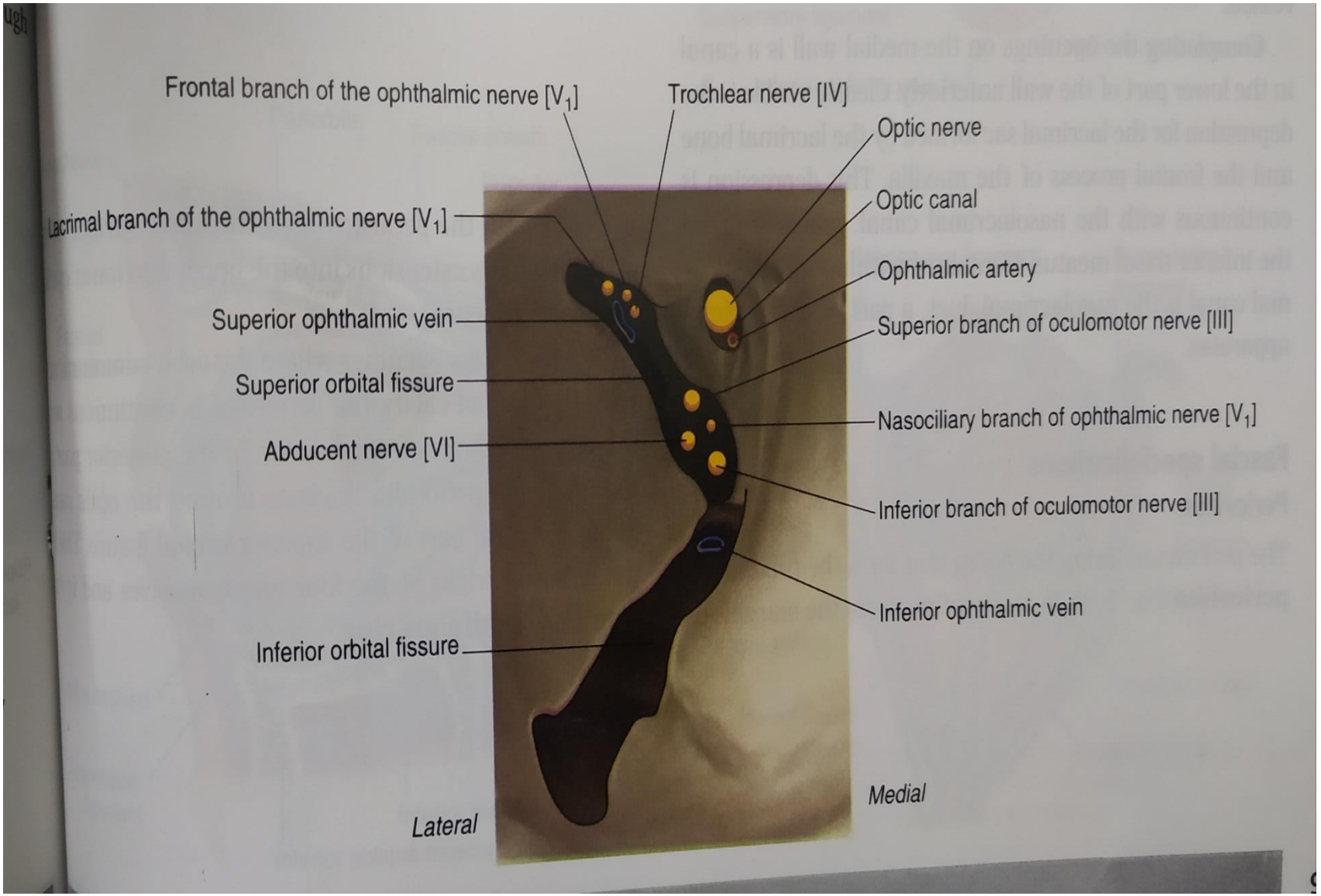

TROCHLEA
SUPERIOR OBLIQUE
SUPERIOR RECTUS
ANNULUS OF ZINN
LATERAL RECTUS
MEDIAL RECTUS
INFERIOR OBLIQUE
INFERIOR RECTUS

Openings into Orbital Cavity

- Superior orbital fissure
- Inferior orbital fissure
- Optic canal
- Orbital opening
- Supraorbital notch
- Infraorbital groove and canal
- Nasolacrimal canal
- Anterior and posterior ethmoidal foramina
- Zygomaticotemporal and facial foramina


Ethmoid
Supraorbital notch
Lacrimal bone
Nasal bone
Frontal bone
Sphenoid
Optic canal
Superior orbital fissure
Zygomatic bone
Zygomaticofacial foramen
Inferior orbital fissure
Infraorbital groove
Maxilla
Infraorbital foramen
Palatine bone
Nasolacrimal canal (fossa)


Supraorbital notch
Optic canal
Superior orbital fissure
Inferior orbital fissure
Lacrimal fossa
Whitnall's tubercle
Infraorbital foramen

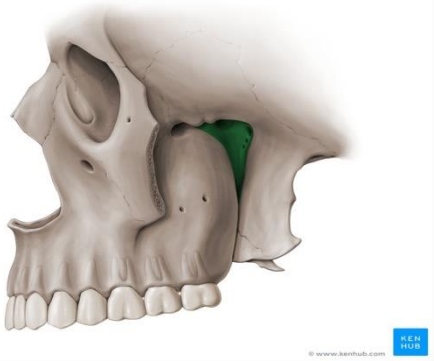

Frontal branch of the ophthalmic nerve [V1]
Trochlear nerve [IV]
Optic nerve
Optic canal
Lacrimal branch of the ophthalmic nerve [V1]
Ophthalmic artery
Superior ophthalmic vein
Superior branch of oculomotor nerve [III]
Superior orbital fissure
Nasociliary branch of ophthalmic nerve [V1]
Abducent nerve [VI]
Inferior branch of oculomotor nerve [III]
Inferior ophthalmic vein
Inferior orbital fissure
Medial
Lateral

Superior orbital fissure

- Located posteriorly between greater and lesser wings of sphenoid.
- Contents:
  1. Oculomotor nerve[III]
  2. Trochlear nerve[IV]
  3. Abducent nerve[VI]
  4. Ophthalmic nerve branches: lacrimal, frontal and nasociliary.
  5. Superior ophthalmic vein.

Inferior Orbital fissure

- Located between maxilla and greater wing of sphenoid.
- Communicates with pterygopalatine fossa.
- Contents:
  1. Maxillary nerve and its zygomatic and Infraorbital branches.
  2. Inferior Ophthalmic vein.
  3. sympathetic nerves.



Optic Canal

- Located posteriorly in lesser wing of sphenoid at the apex of canal.
- Communicates with middle cranial fossa
- Contents:
  1. Optic nerve
  2. Ophthalmic artery

Orbital Opening:

- Large Anterior Opening.
- Forming the base of Orbit.
- 1/6 of eyeball protrudes through it.

Supraorbital Notch:

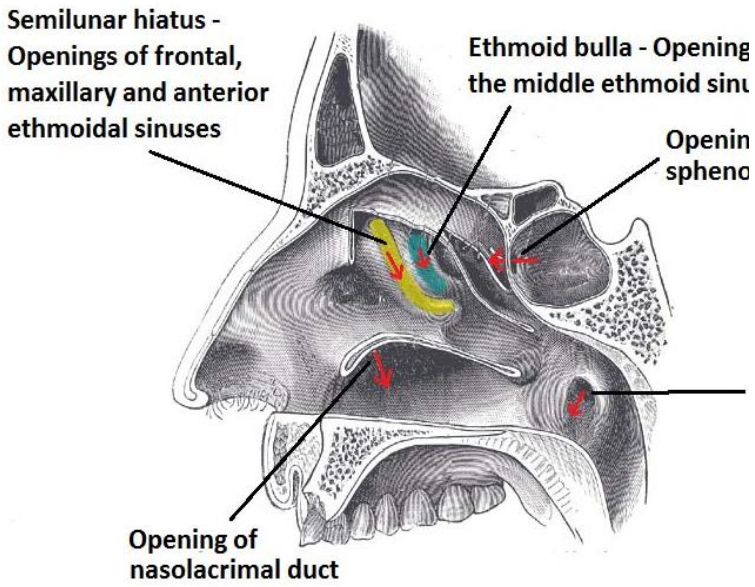
- Present in frontal bone on superior orbital margin.
- Contents:
  1. Supraorbital Nerve.
  2. Supraorbital blood vessels.

Infraorbital Groove and canal:

- Contents:
  1. Infraorbital nerve
  2. Infraorbital blood vessels

Nasolacrimal Canal:

- Present anteriorly on medial wall.
- Transmit nasolacrimal duct
- Communicates with inferior meatus of nose.



Anterior and Posterior ethmoidal foramina:

- Two small openings on the medial wall in ethmoid bone.
- Transmit anterior and posterior ethmoid nerves.

Zygomaticotemporal and Zygomaticofacial Foramina:

- Two small openings in lateral wall in zygomatic bone.
- Transmit Zygomaticotemporal and Zygomaticofacial nerves.

Clinical Relevance

- Orbital Fractures
- Two types

1. **Orbital rim fracture**:

Fracture of bones forming rim of orbit.

2. **Blowout fracture:**

Partial herniation of orbital content through one of its wall.

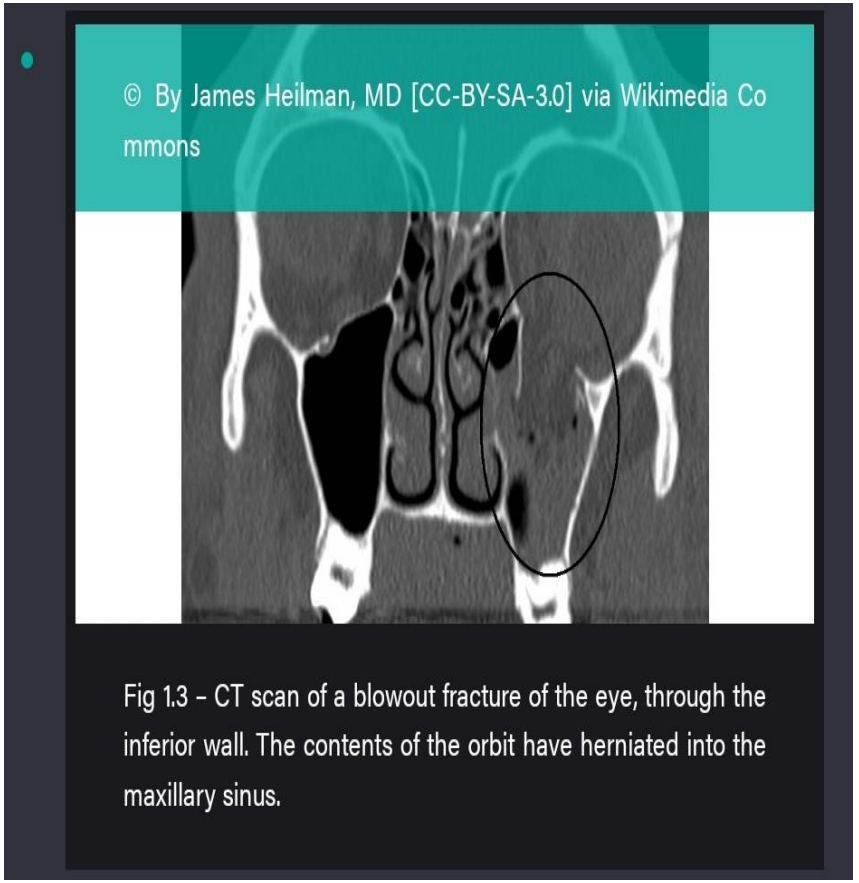
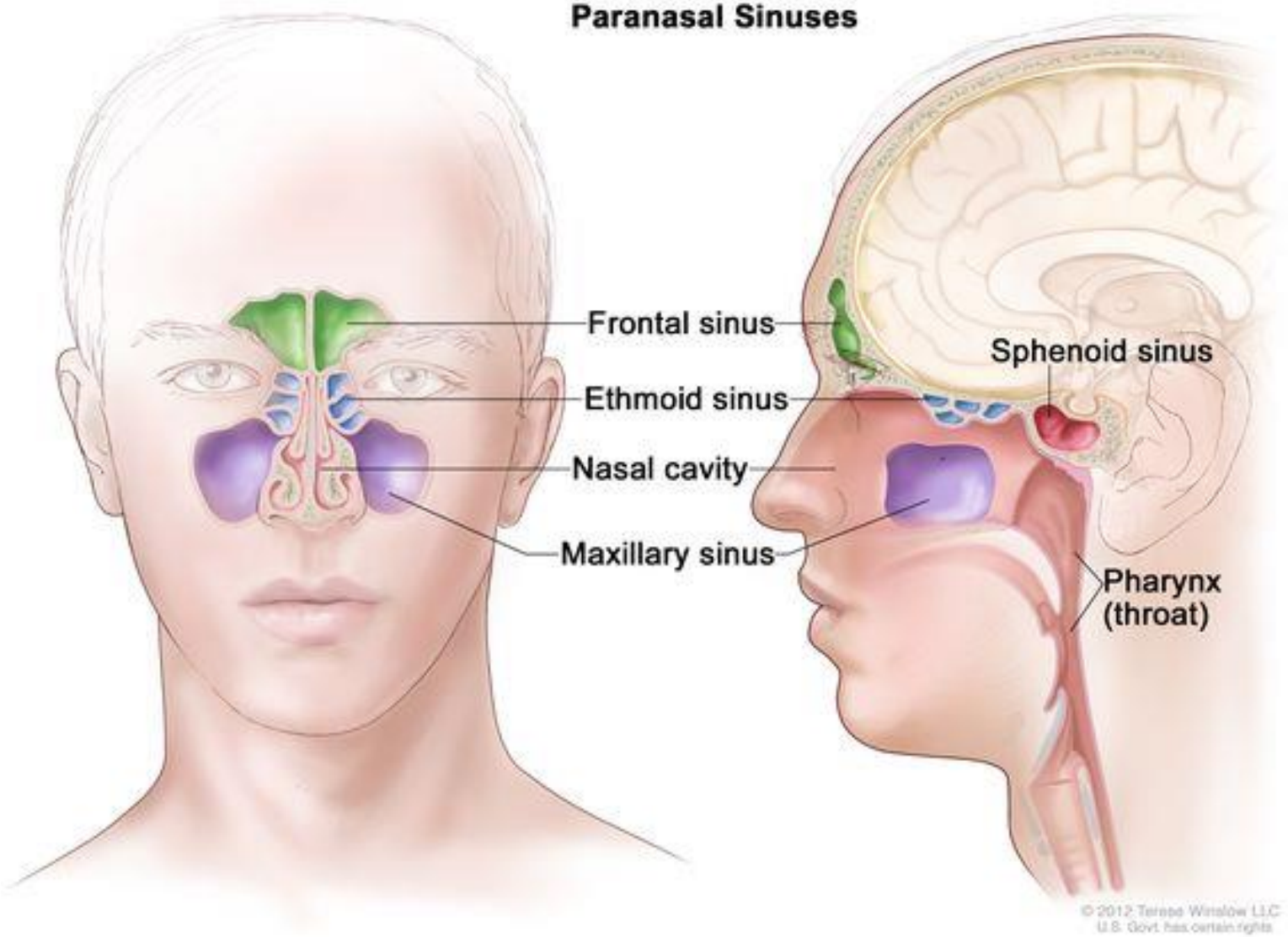


Fig 1.3 – CT scan of a blowout fracture of the eye, through the inferior wall. The contents of the orbit have herniated into the maxillary sinus.


Paranasal Sinuses
Frontal sinus
Ethmoid sinus
Nasal cavity
Maxillary sinus
Sphenoid sinus
Pharynx
(throat)
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