



Orbit, nasal cavity and pterygopalatine fossa.

Muscles of the head

Sándor Katz M.D.,Ph.D.

Orbit

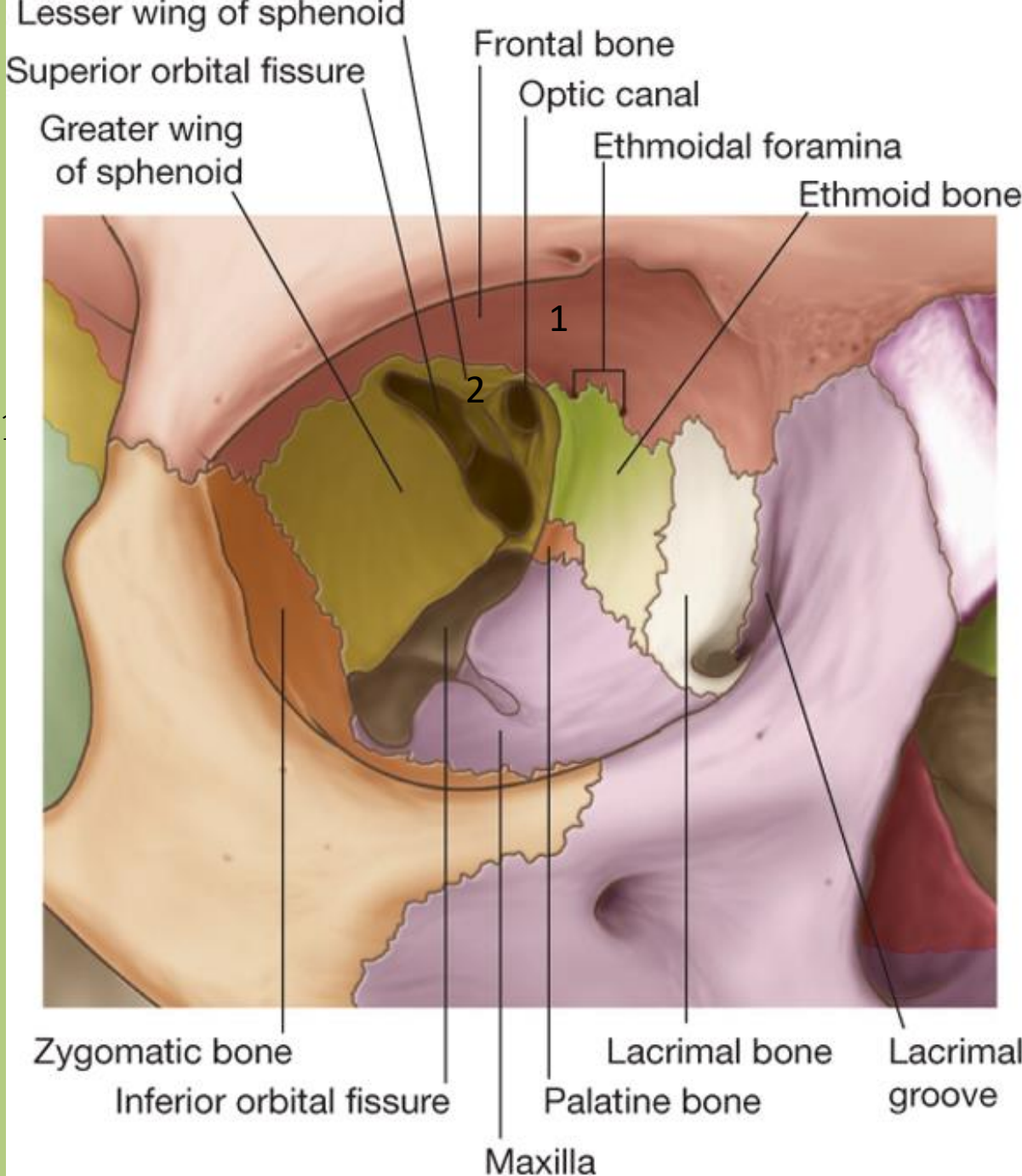
- pyramidal bony cavity
- base is directed anterolaterally
- apex is directed posteromedially

Contents: eyeball, extraocular muscles, nerves, vessels and lacrimal apparatus.



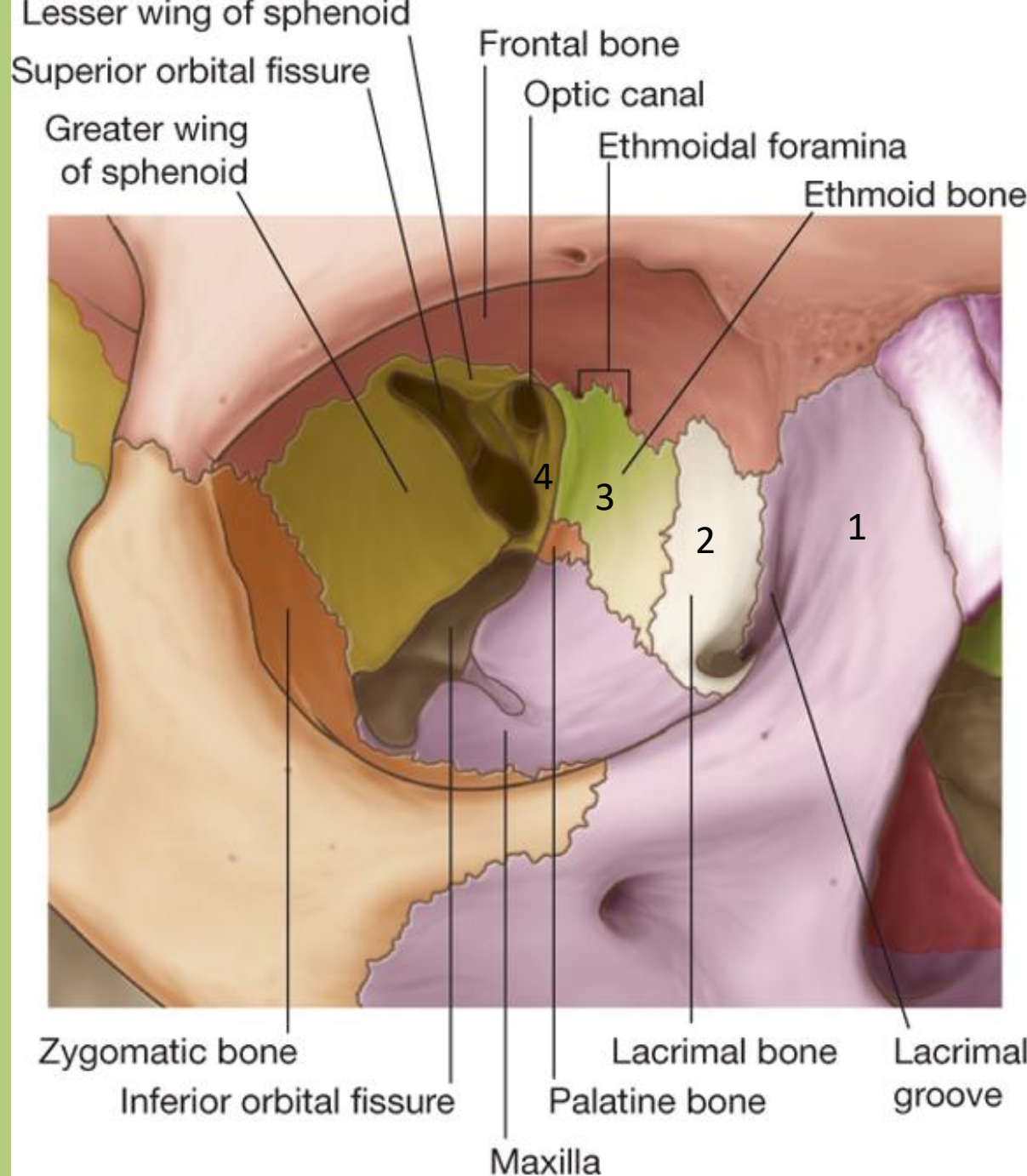
ORBIT:
SUPERIOR WALL

- orbital part of the frontal bone (1)
- lesser wing of the sphenoid (2)
- superior orbital fissure
- optic canal



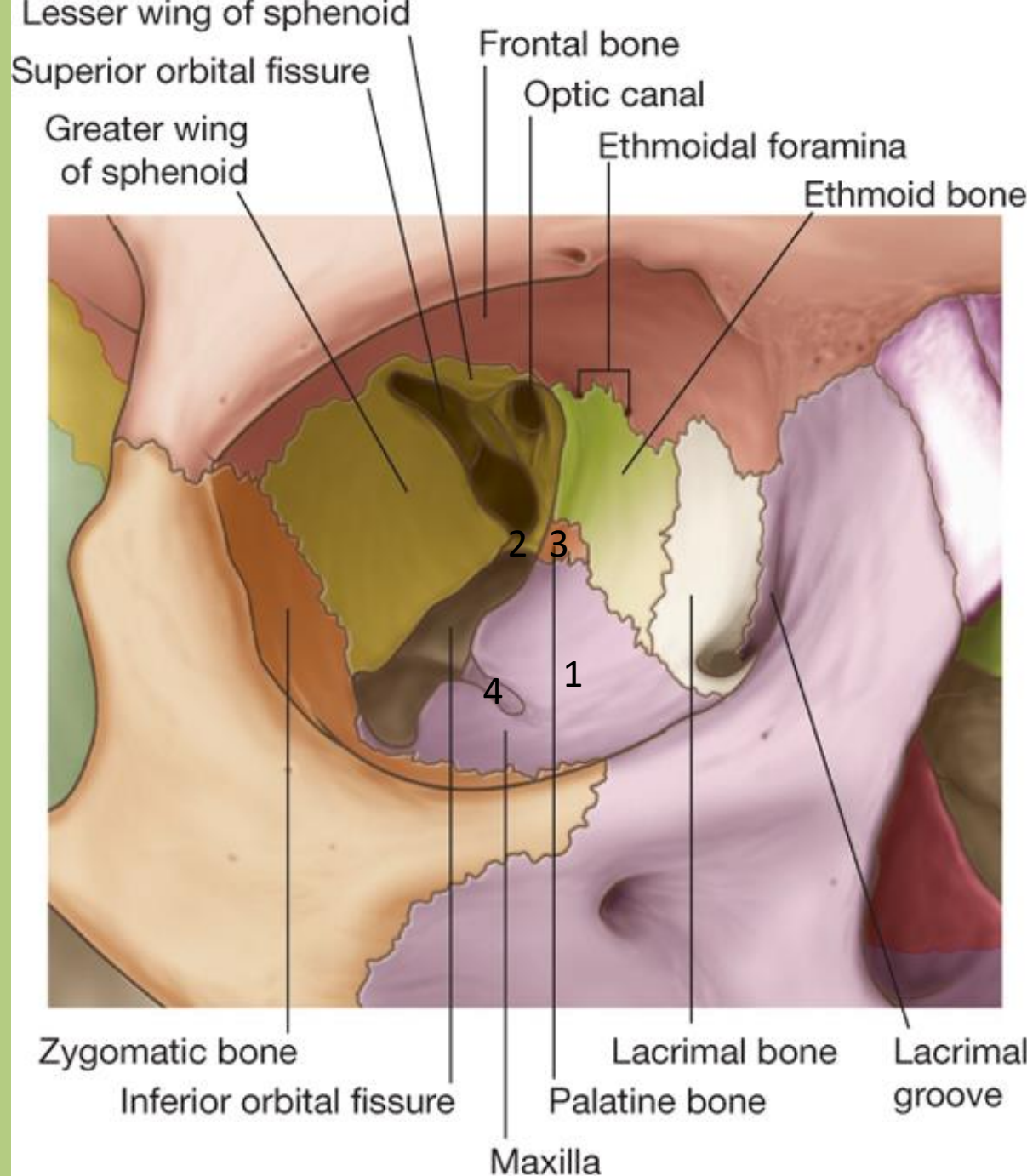
ORBIT:
MEDIAL WALL

- frontal process of maxilla (1)
- lacrimal bone (2)
- lacrimal groove
- nasolacrimal canal
- orbital plate of ethmoid bone (3)
- anterior and posterior ethmoidal foramina
- body of sphenoid (4)



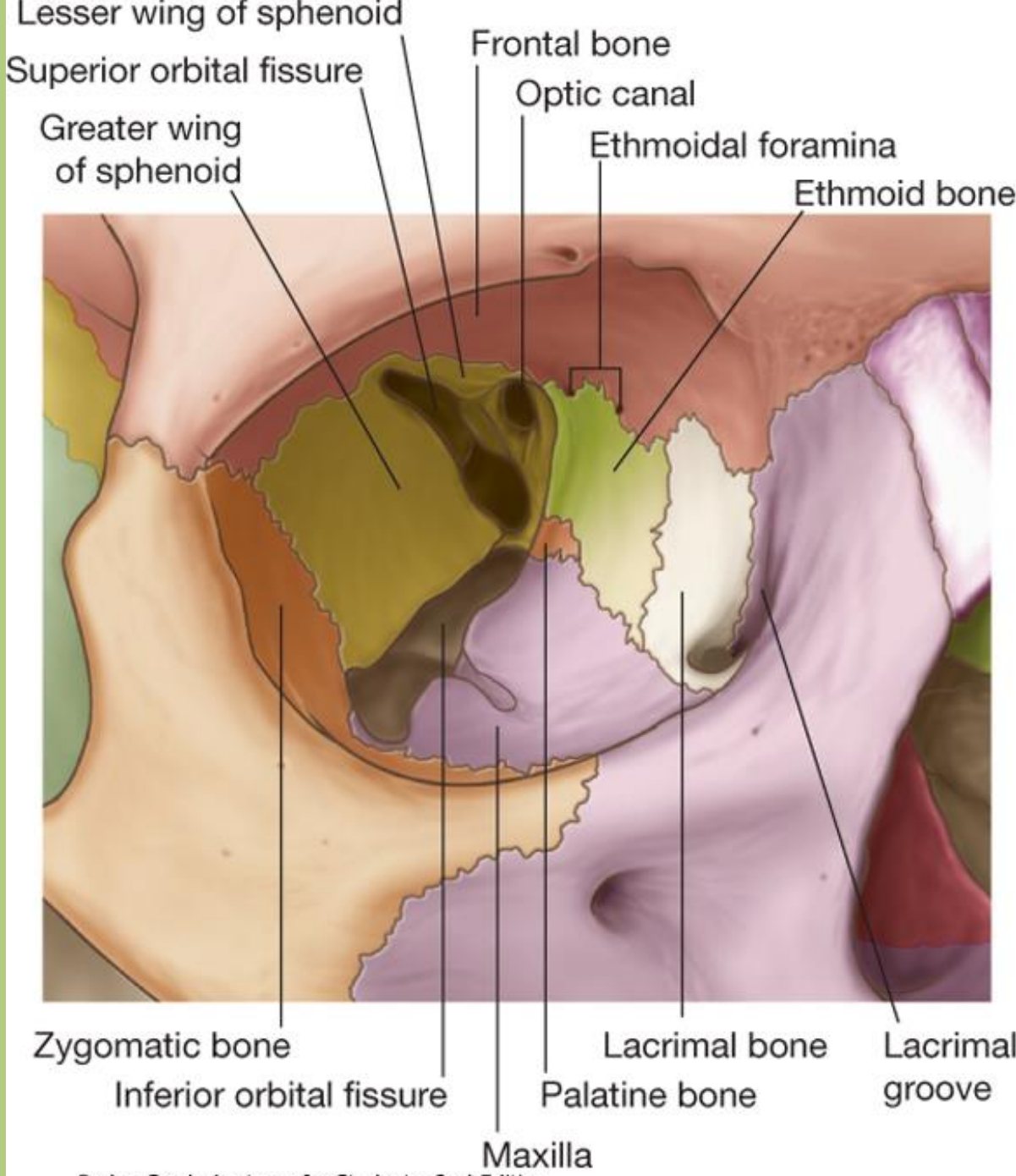
ORBIT:
INFERIOR WALL

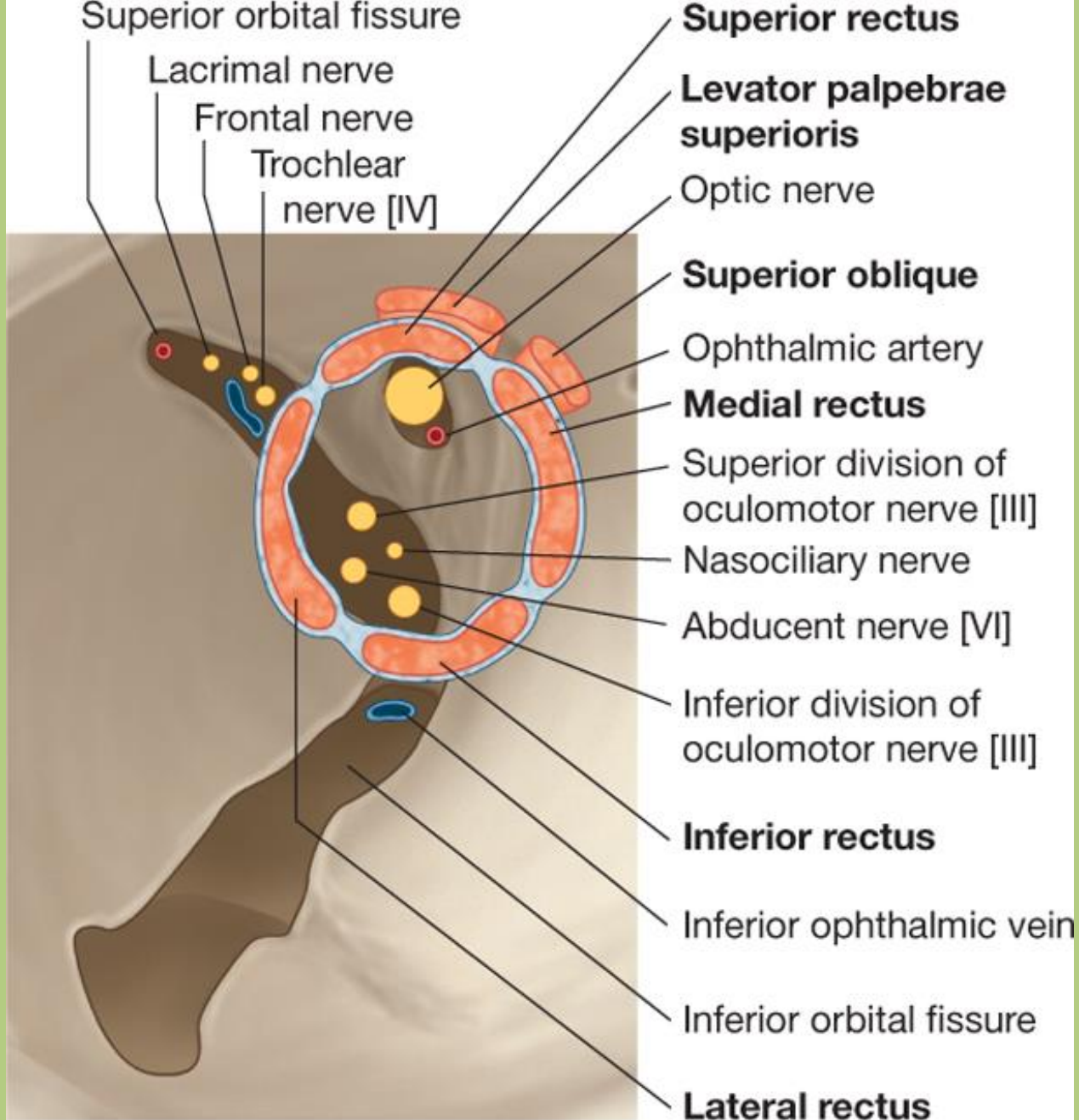
- body of maxilla (1)
- body of sphenoid (2)
- perpendicular plate of palatine bone (3)
- inferior orbital fissure
- infraorbital groove (4)
- infraorbital canal



ORBIT:
LATERAL WALL

- greater wing of sphenoid
- zygomatic bone





Superior orbital fissure
Lacrimal nerve
Frontal nerve
Trochlear nerve [IV]

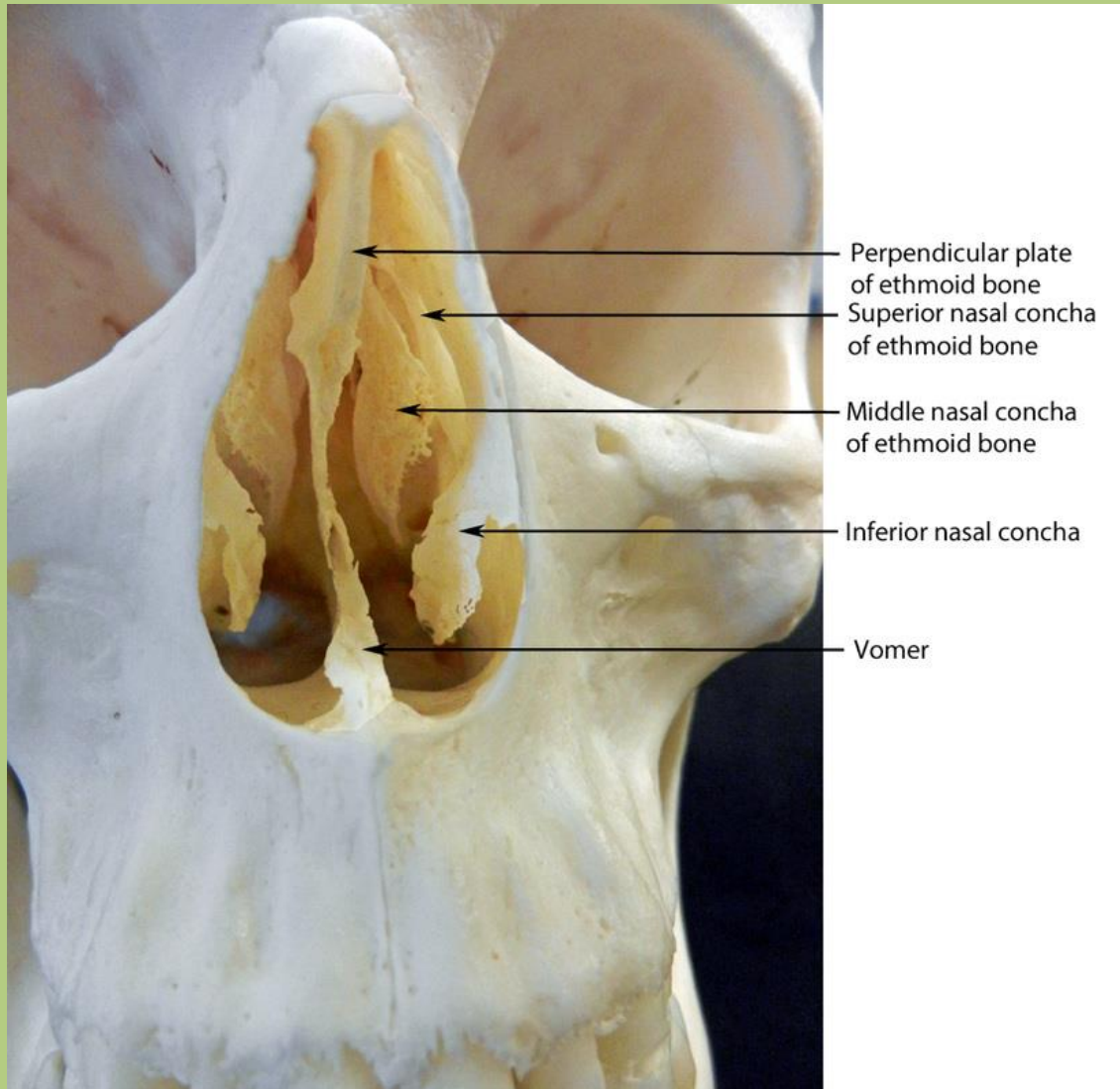
Superior rectus
Levator palpebrae superioris
Optic nerve
Superior oblique
Ophthalmic artery
Medial rectus
Superior division of oculomotor nerve [III]
Nasociliary nerve
Abducent nerve [VI]
Inferior division of oculomotor nerve [III]
Inferior rectus
Inferior ophthalmic vein
Inferior orbital fissure
Lateral rectus

Lateral

Medial

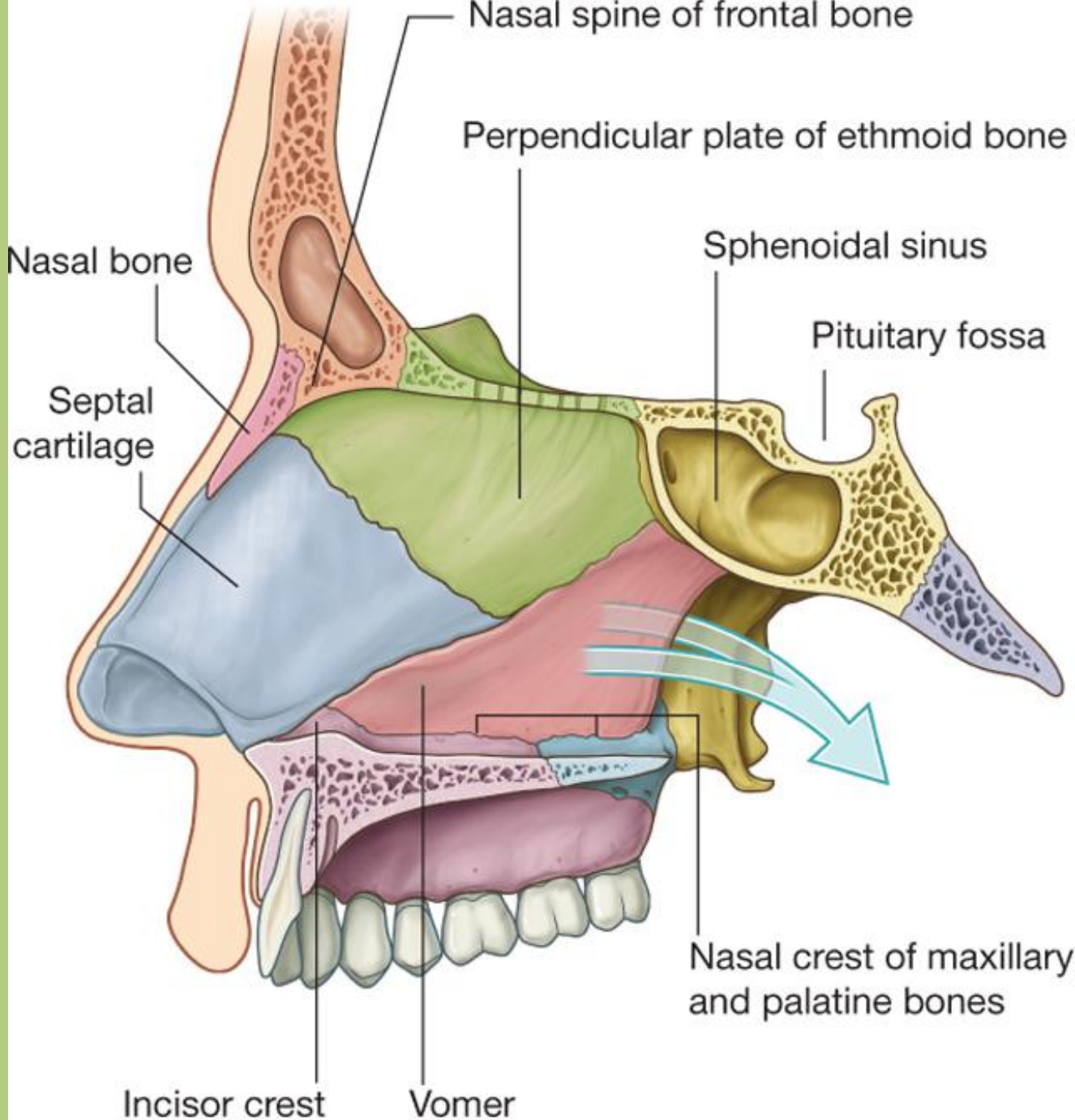
Nasal cavity

- divided by the nasal septum
- openings: piriform aperture and choanae
- lined by nasal mucosa
- divisible into an olfactory and a respiratory area
- connection with the paranasal sinuses



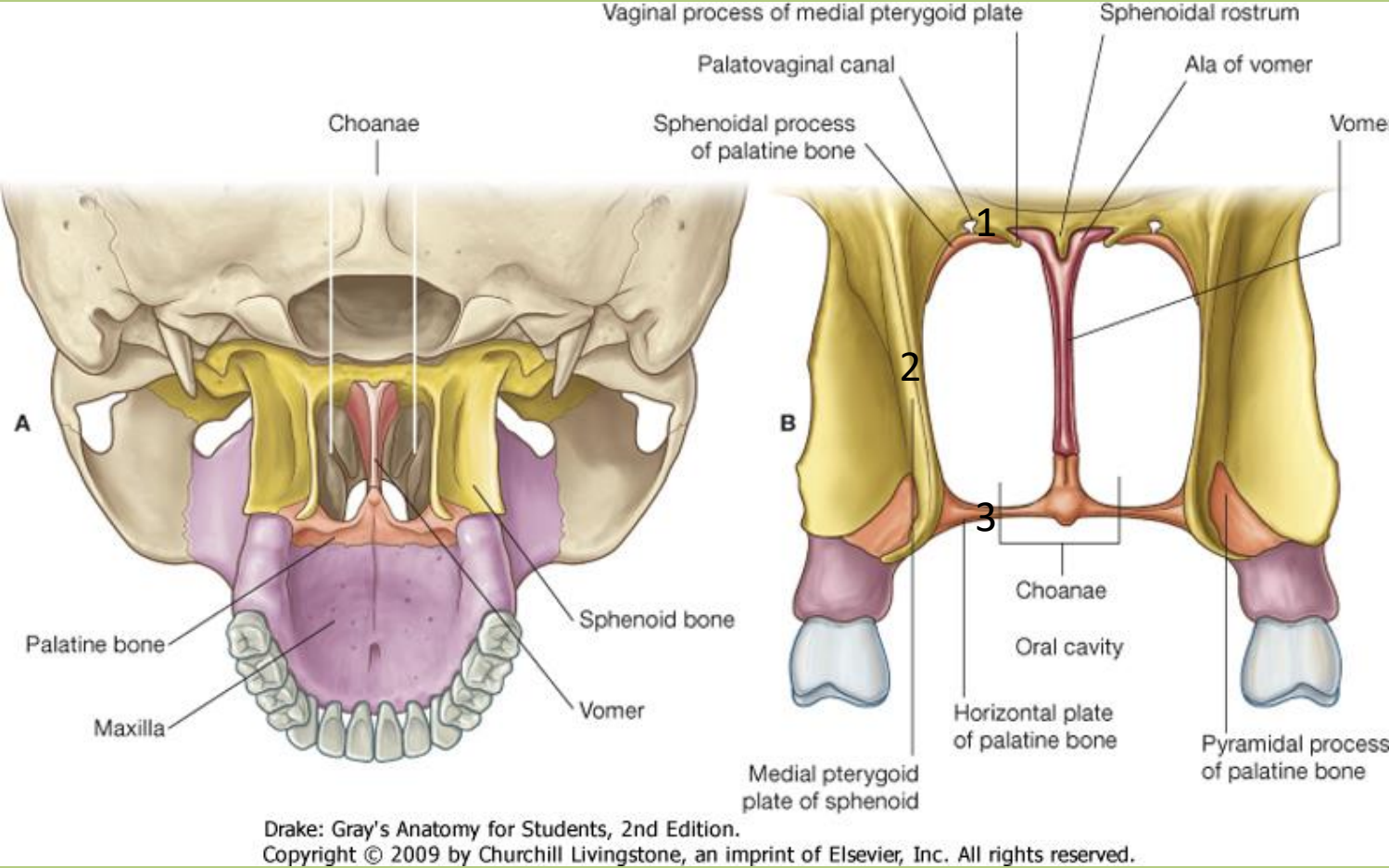
NASAL CAVITY:
MEDIAL WALL

- bony nasal septum:
perpendicular plate of
ethmoid and
vomer



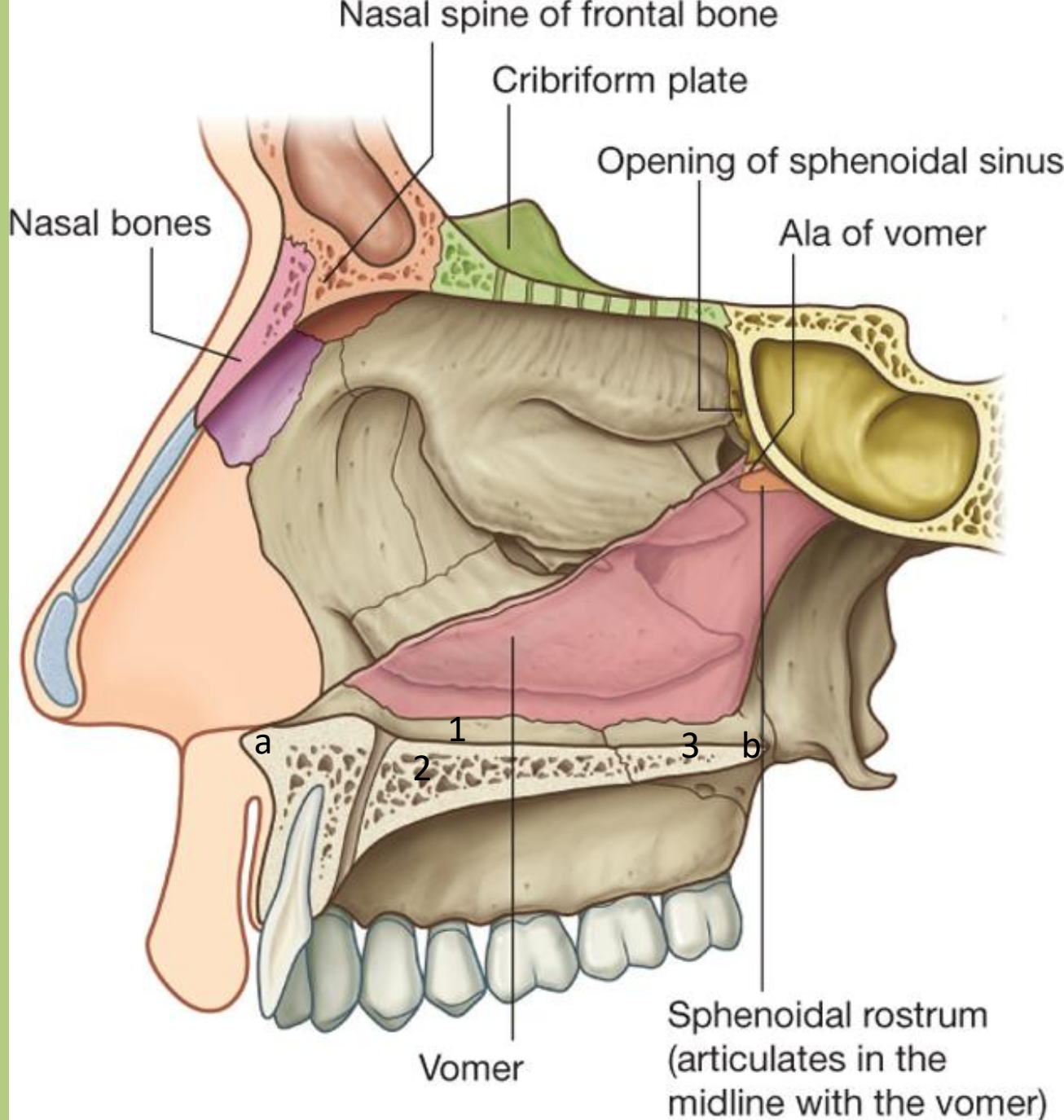
NASAL CAVITY:

- **choanae:**
body of sphenoid (1),
medial lamina of pterygoid process (2),
horizontal plate of palatine bone (3), vomer



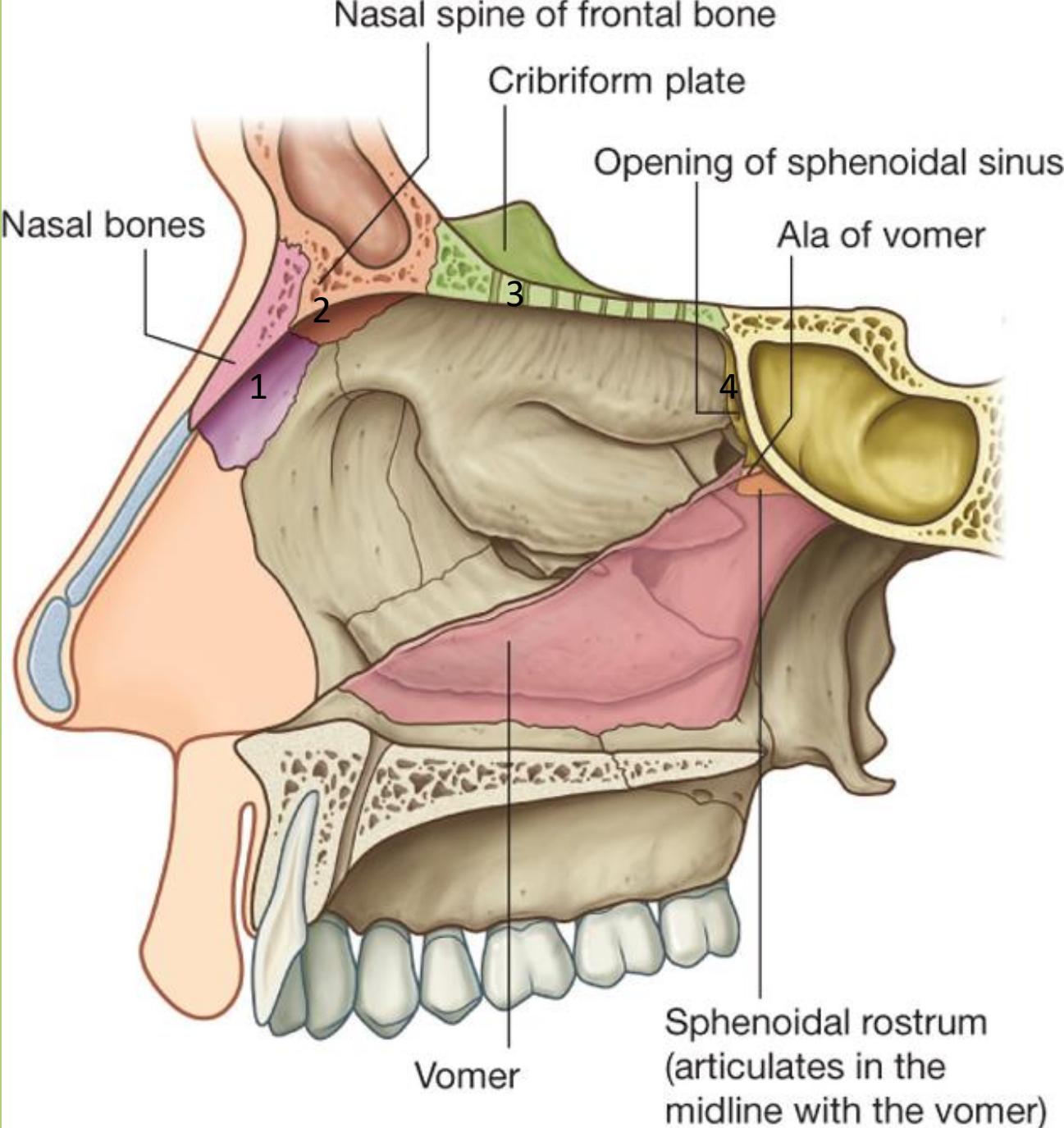
NASAL CAVITY:
INFERIOR WALL

- nasal crest (1)
- anterior nasal spine (a)
- posterior nasal spine (b)
- palatine process of maxilla (2)
- horizontal plate of palatine (3)



NASAL CAVITY:
SUPERIOR WALL

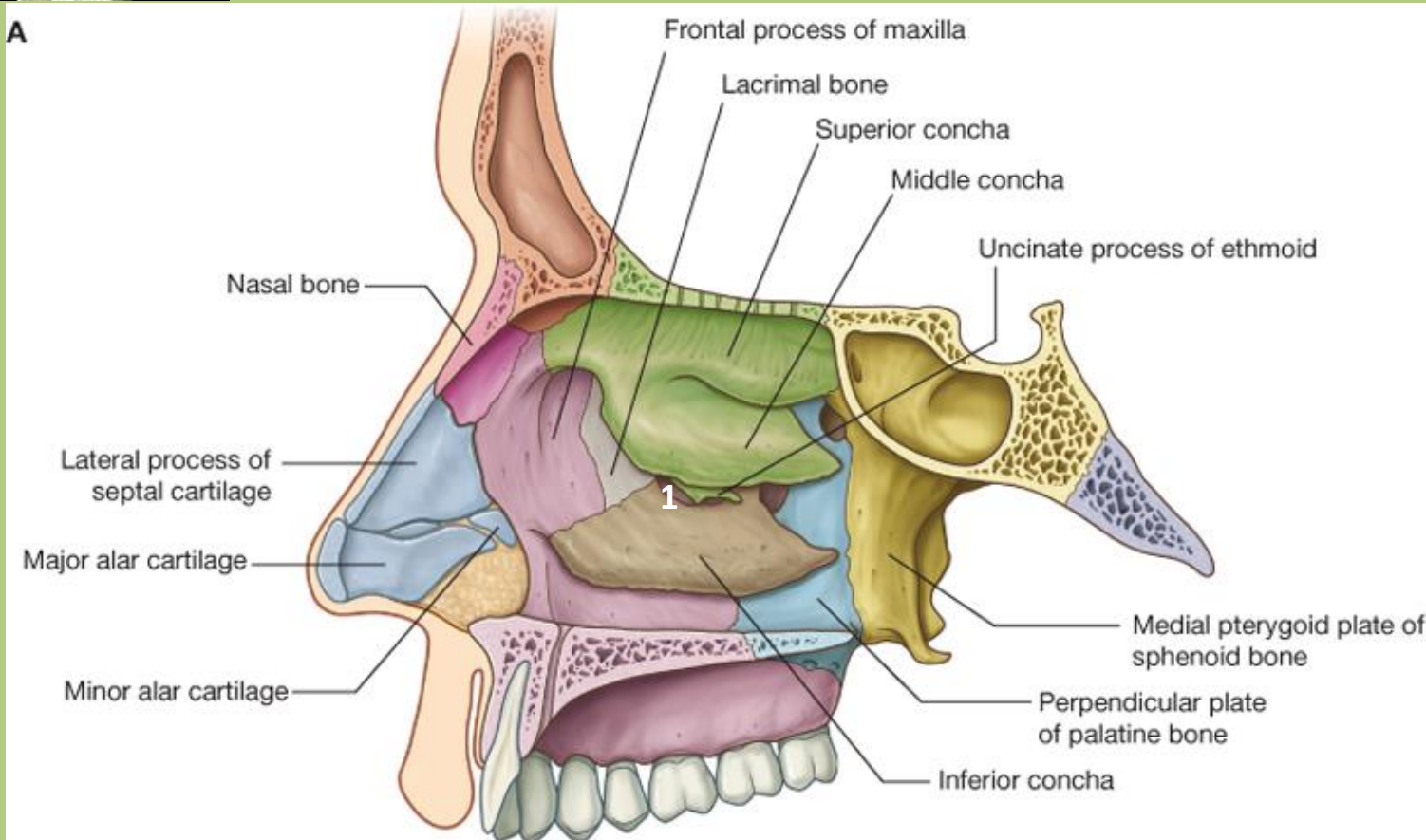
- nasal bone (1)
- nasal part of frontal bone (2)
- cribriform plate of ethmoid (3)
- sphenothmoid recess (4)





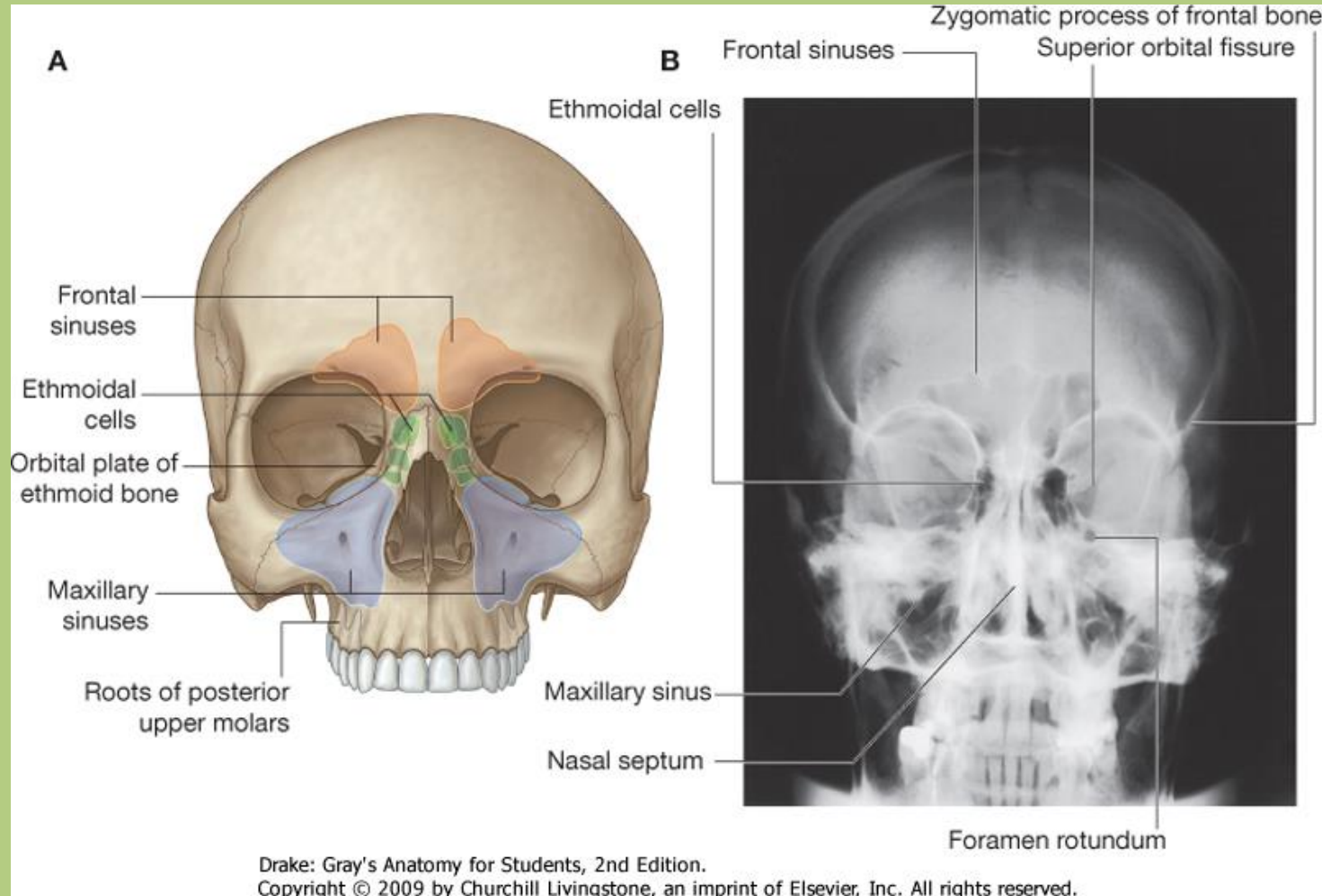
NASAL CAVITY:
LATERAL
WALL

- frontal process of maxilla
- lacrimal bone
- ethmoid bone
- nasal conchae
- ethmoid bulla
- semilunar hiatus (1)
- sphenoid bone
- body of maxilla
- perpendicular plate of palatine
- medial lamina of pterygoid process
- sphenopalatine foramen
- nasolacrimal canal

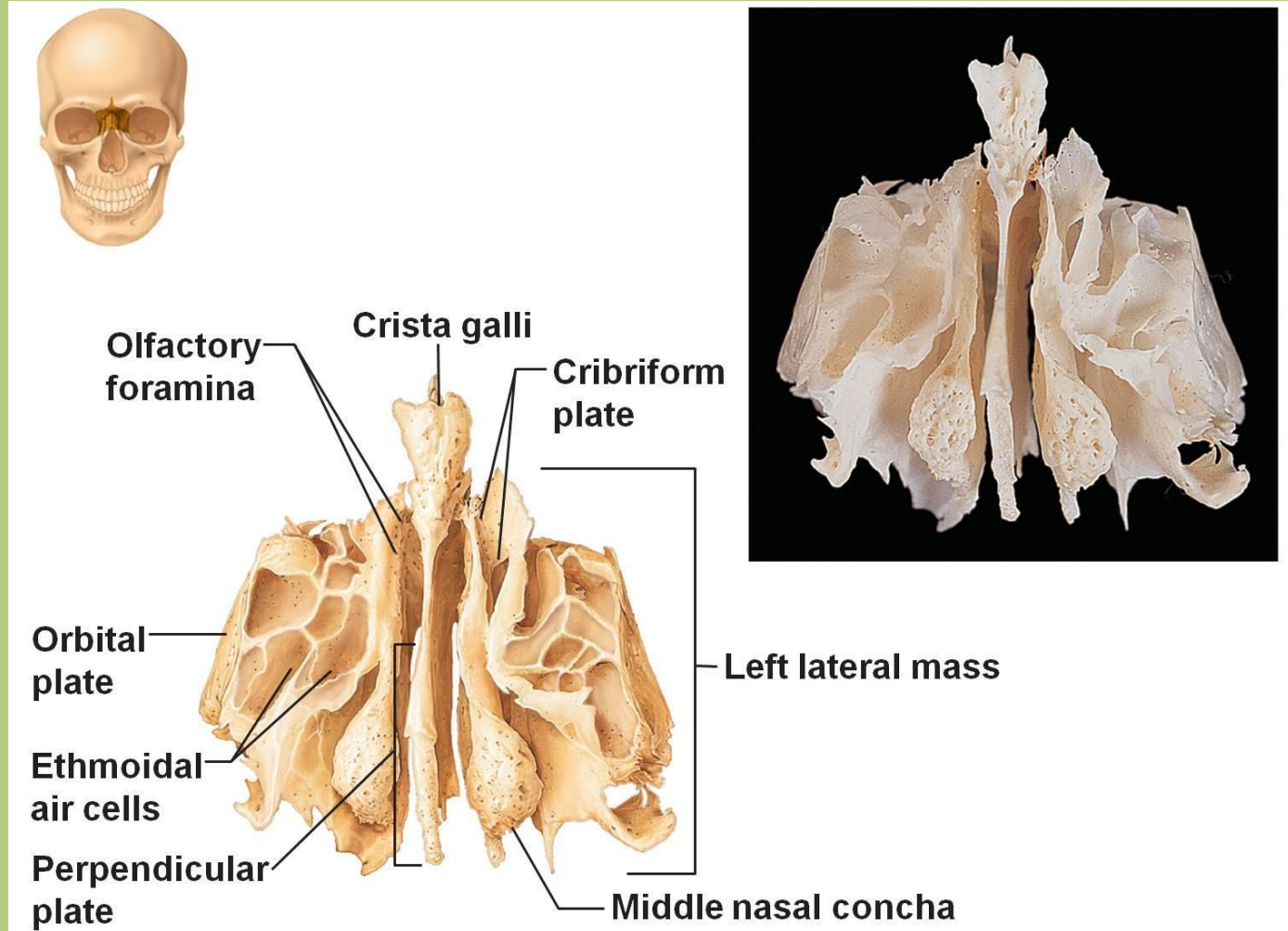


Paranasal sinuses

- communication with the nasal cavity
- they reduce the weight of the skull
- lined by pseudostratified columnar ciliated epithelium
- they heat and moisturise the air
- act as resonators of voice

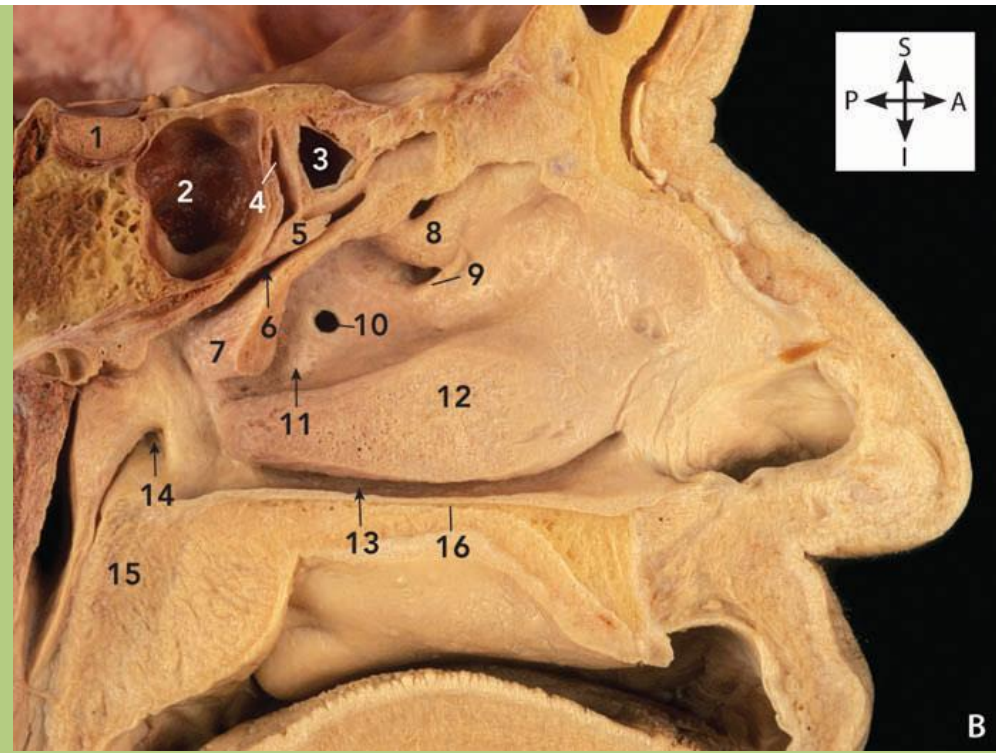
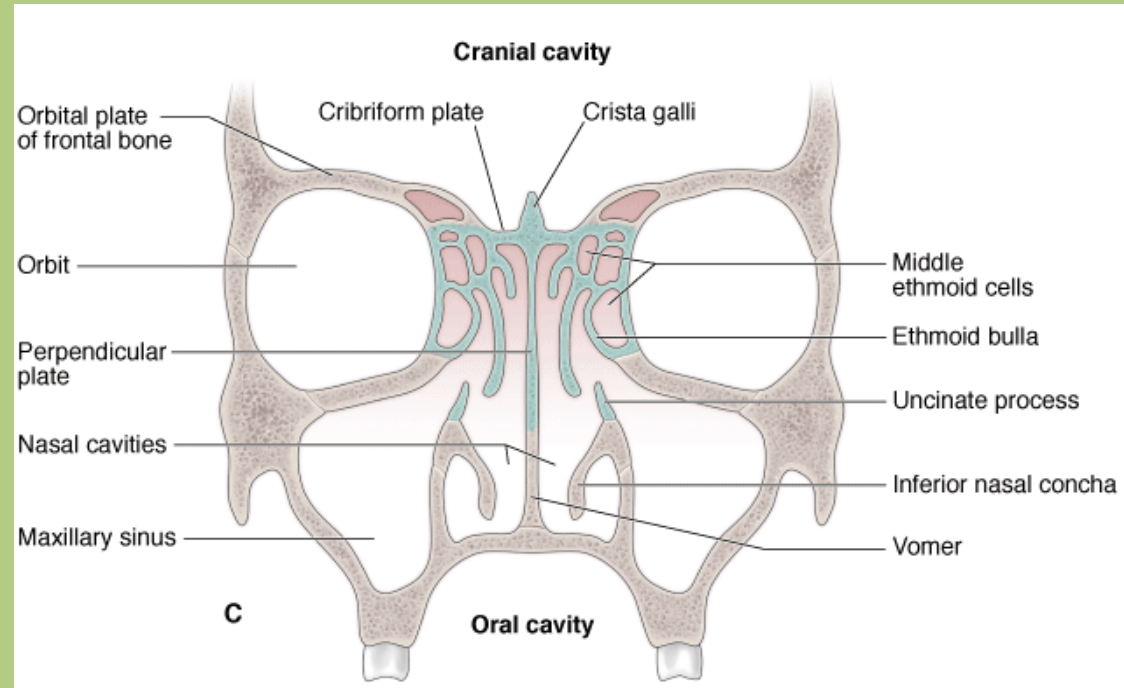


Ethmoidal air cells

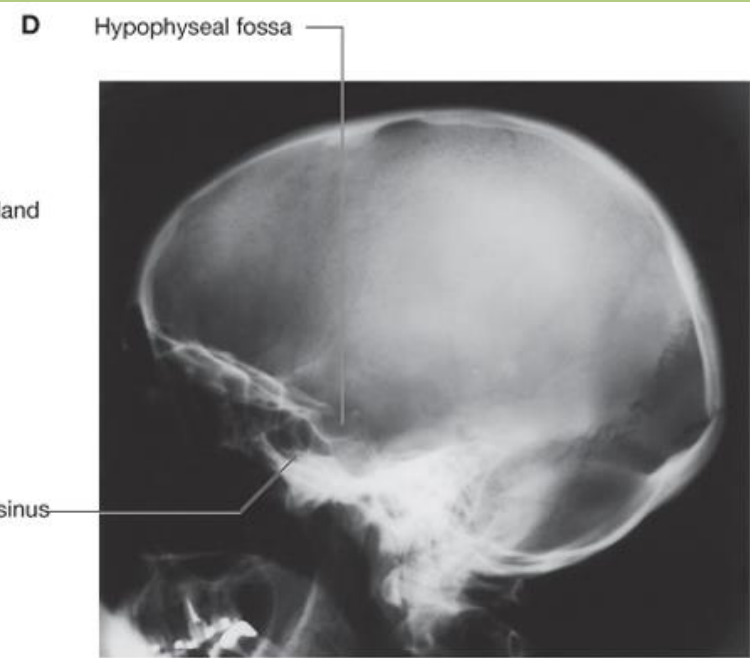
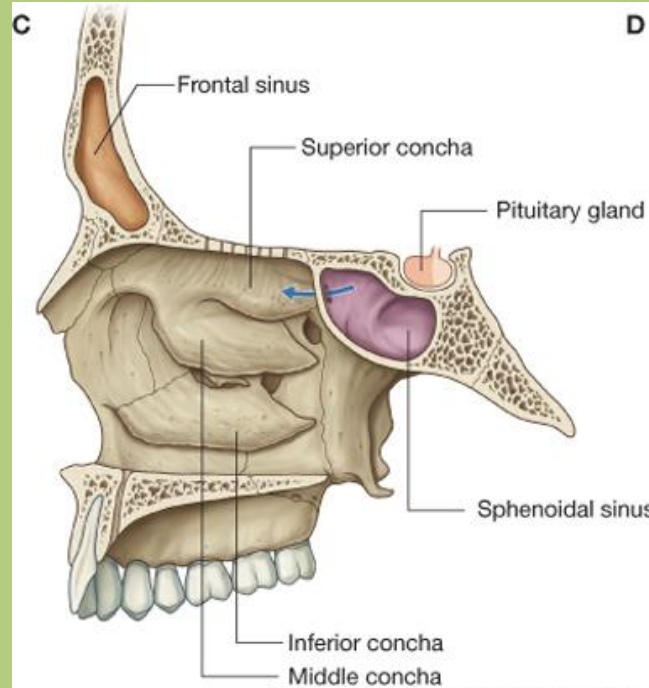


Ethmoidal air cells

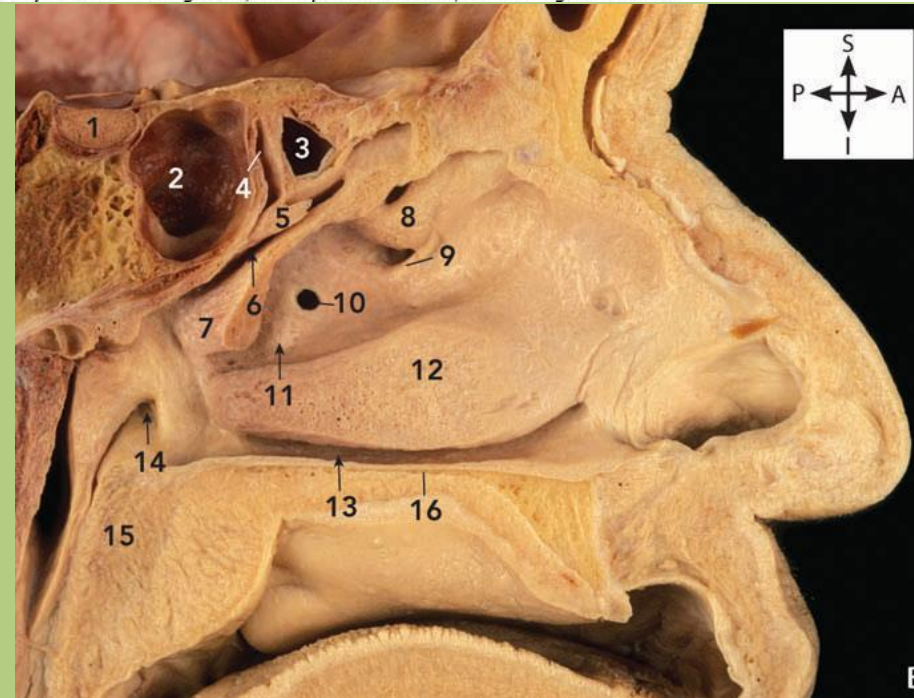
- ethmoid bulla (8)



Sphenoid sinus (2)

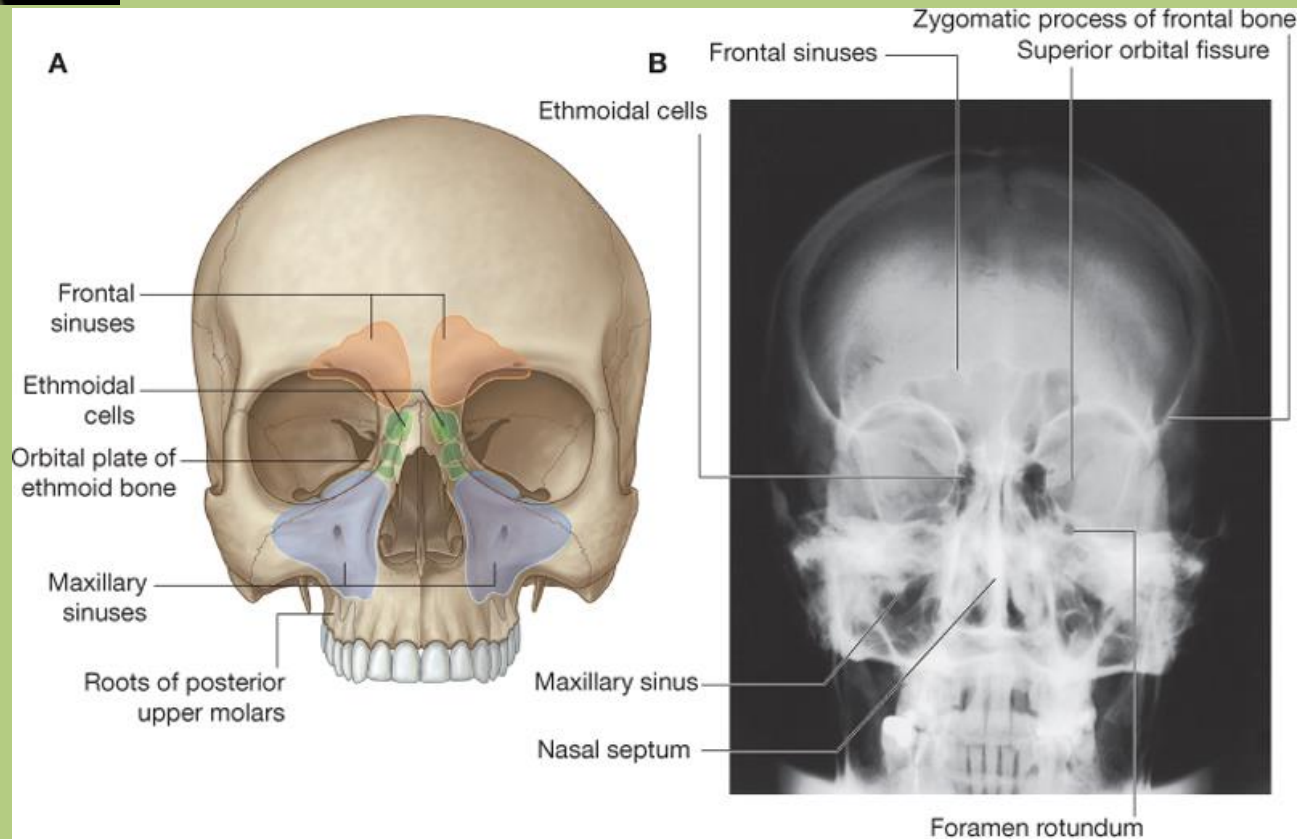


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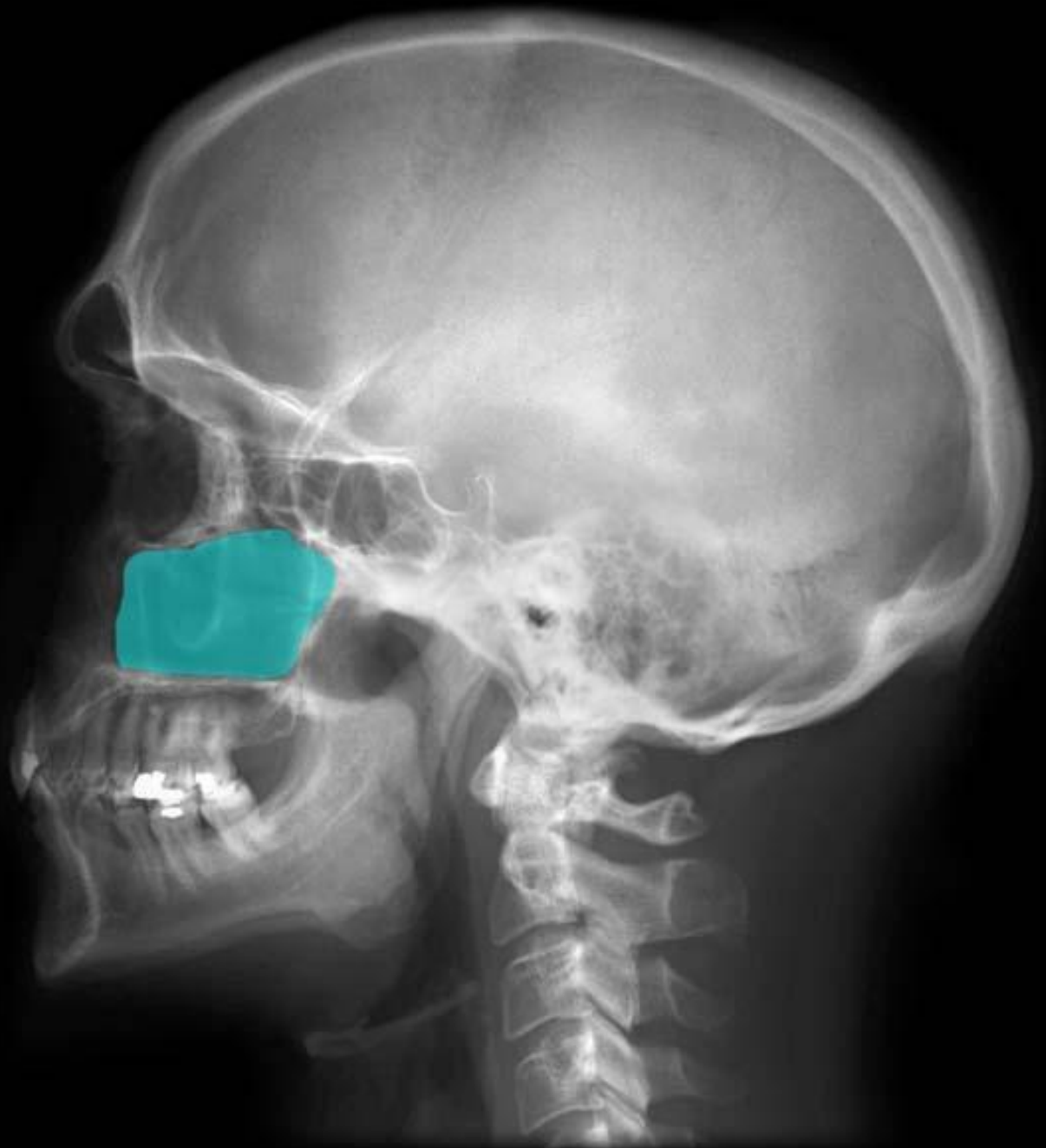




Maxillary sinus=
Highmore's sinus:



Maxillary sinus=
Highmore's sinus:

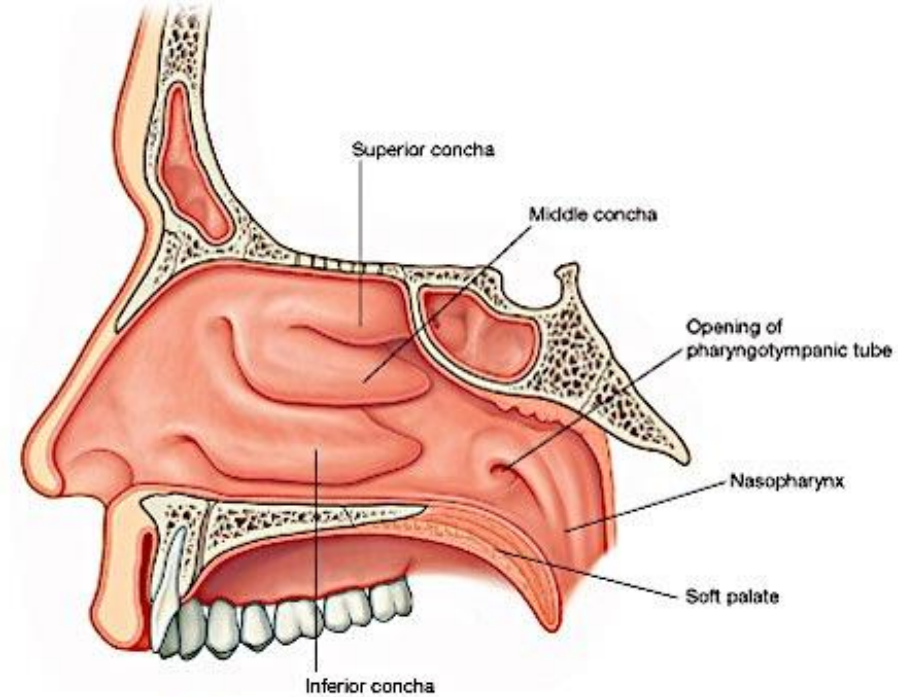


Frontal sinus

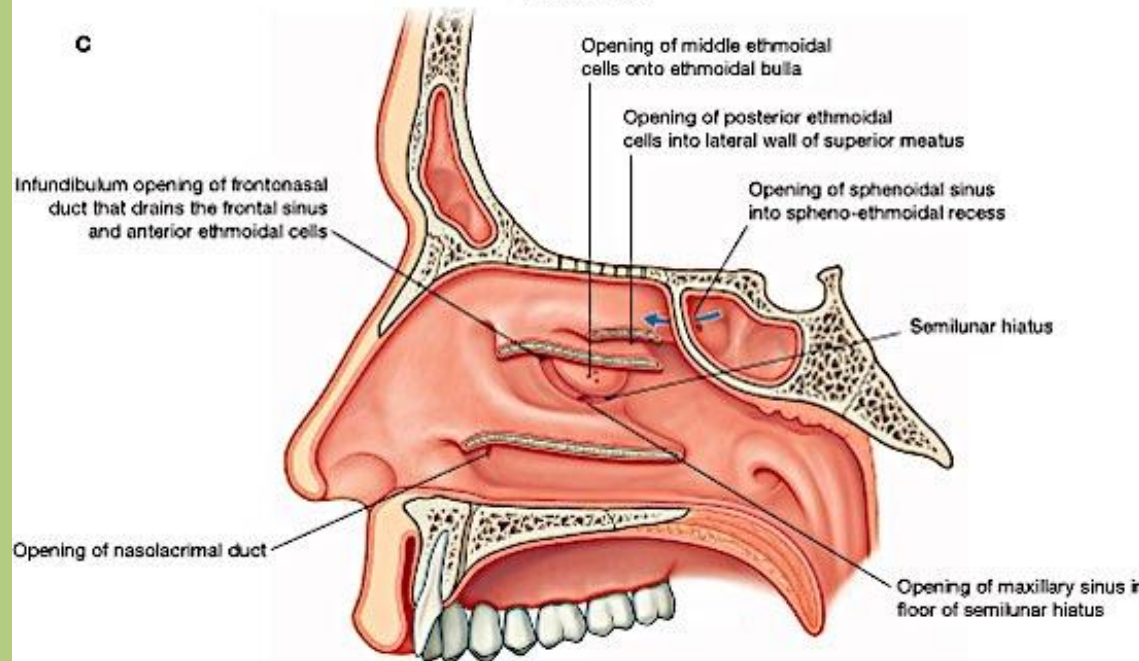


Openings of the sinuses

B



C



HEALTHY SINUS

SINUSITIS

Frontal Sinus

Inflamed Sinus Lining

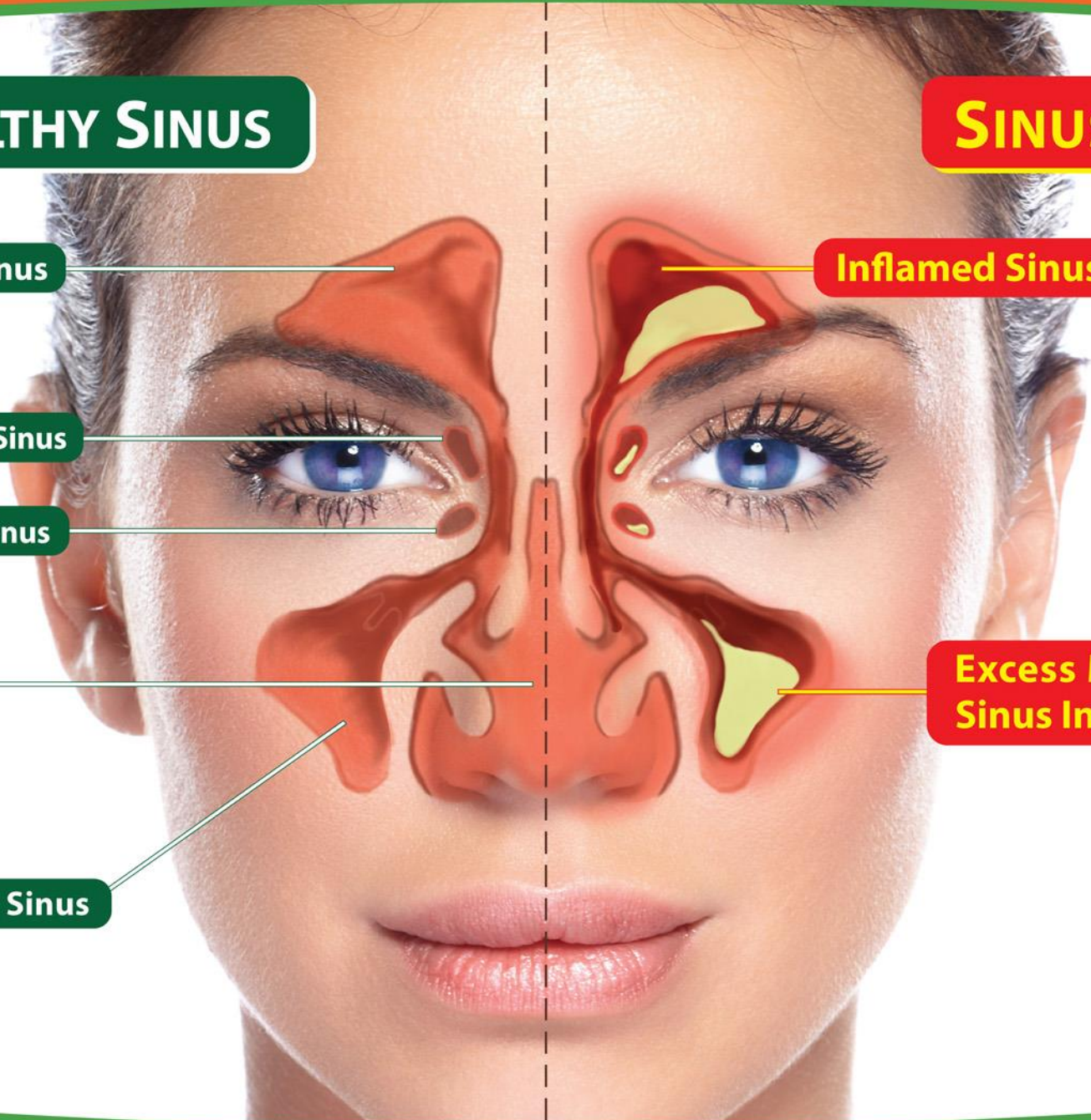
Sphenoid Sinus

Ethmoid Sinus

Septum

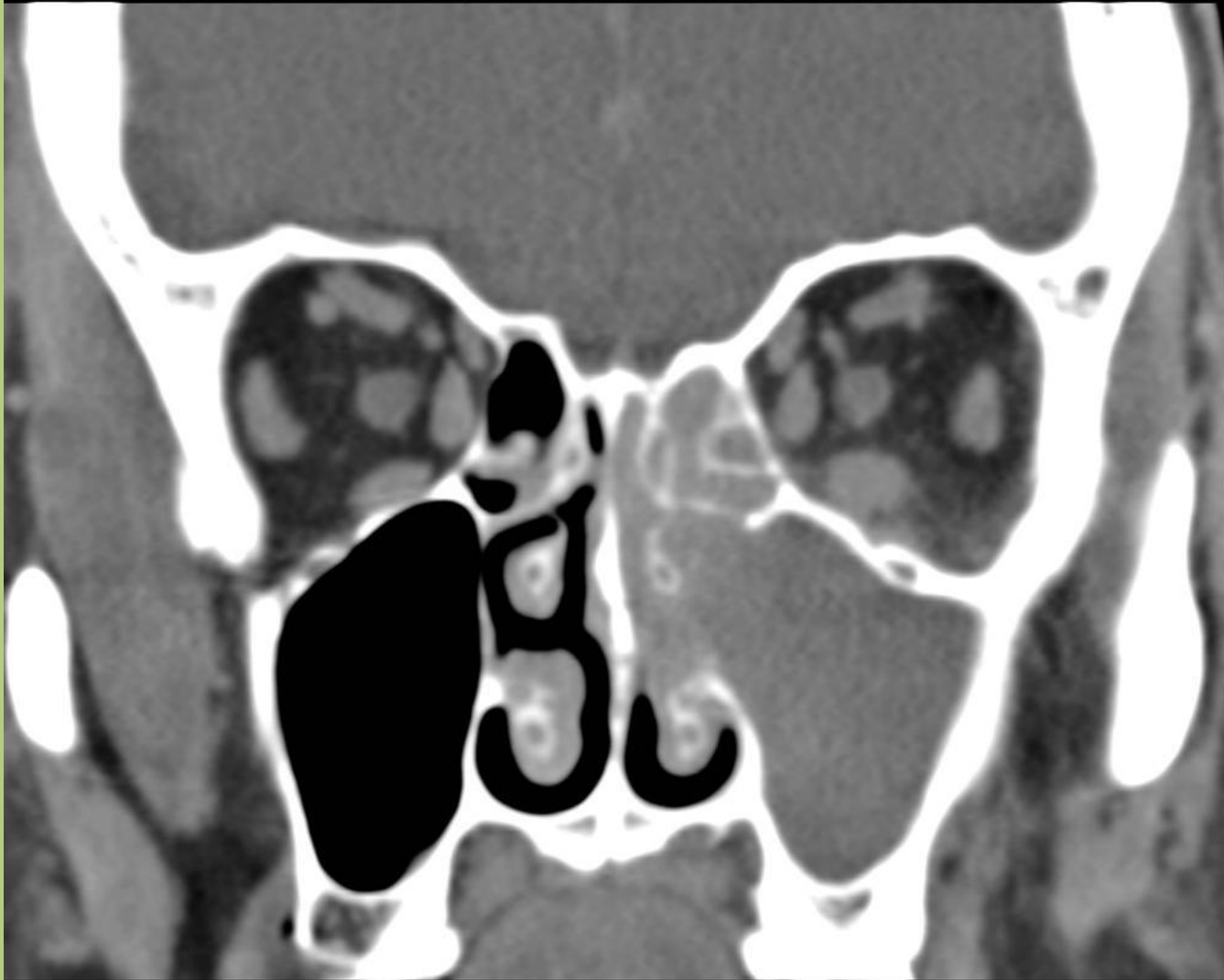
Excess Mucus/
Sinus Infection

Maxillary Sinus





Normal view. Case courtesy of Dr Yair Glick, Radiopaedia.org, rID: 53200



W 693 : L 114



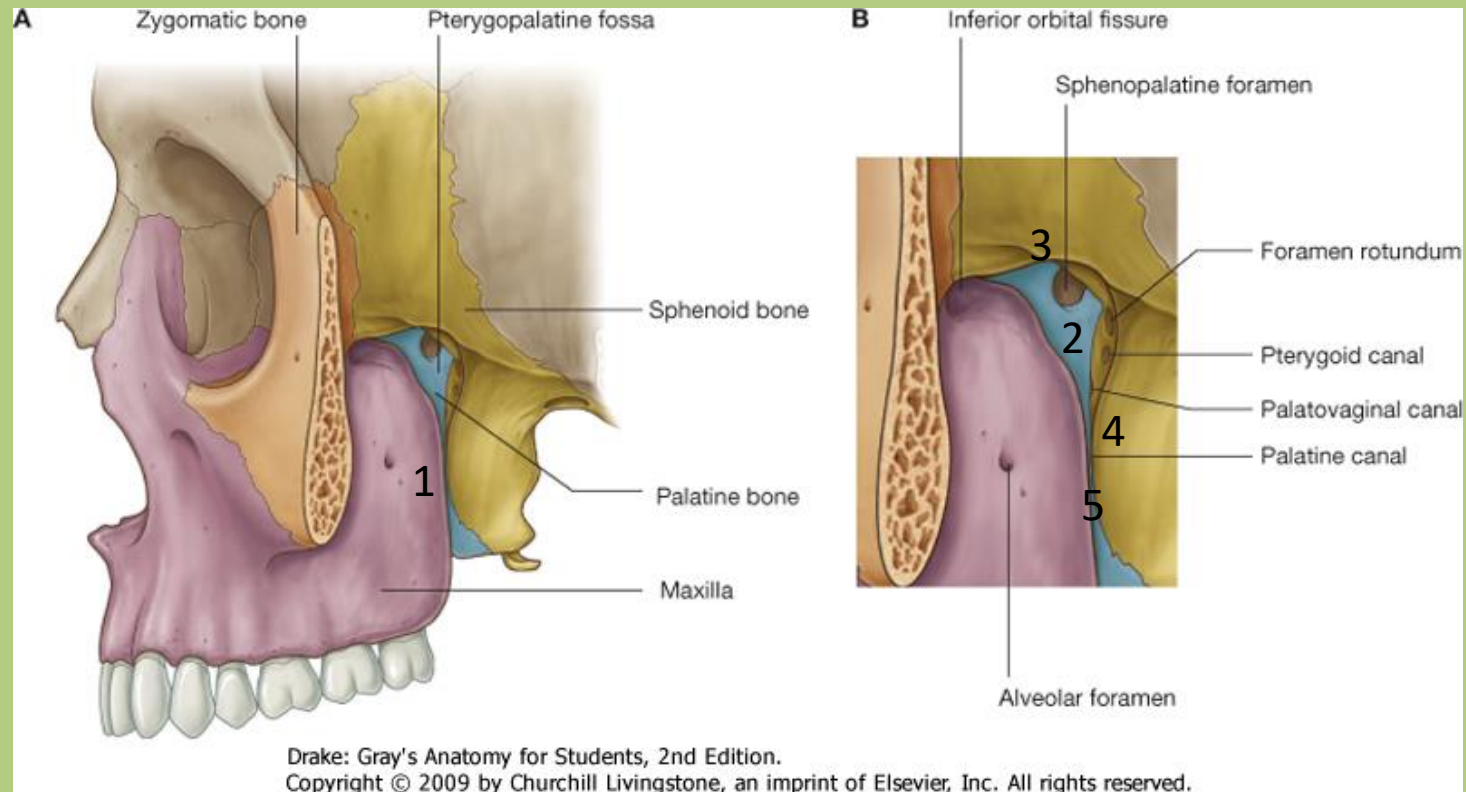
Chronic sinusitis. Case courtesy of Dr Chris O'Donnell, Radiopaedia.org, rID: 30169



Papilloma. Case courtesy of A.Prof Frank Gaillard, Radiopaedia.org, rID: 9399

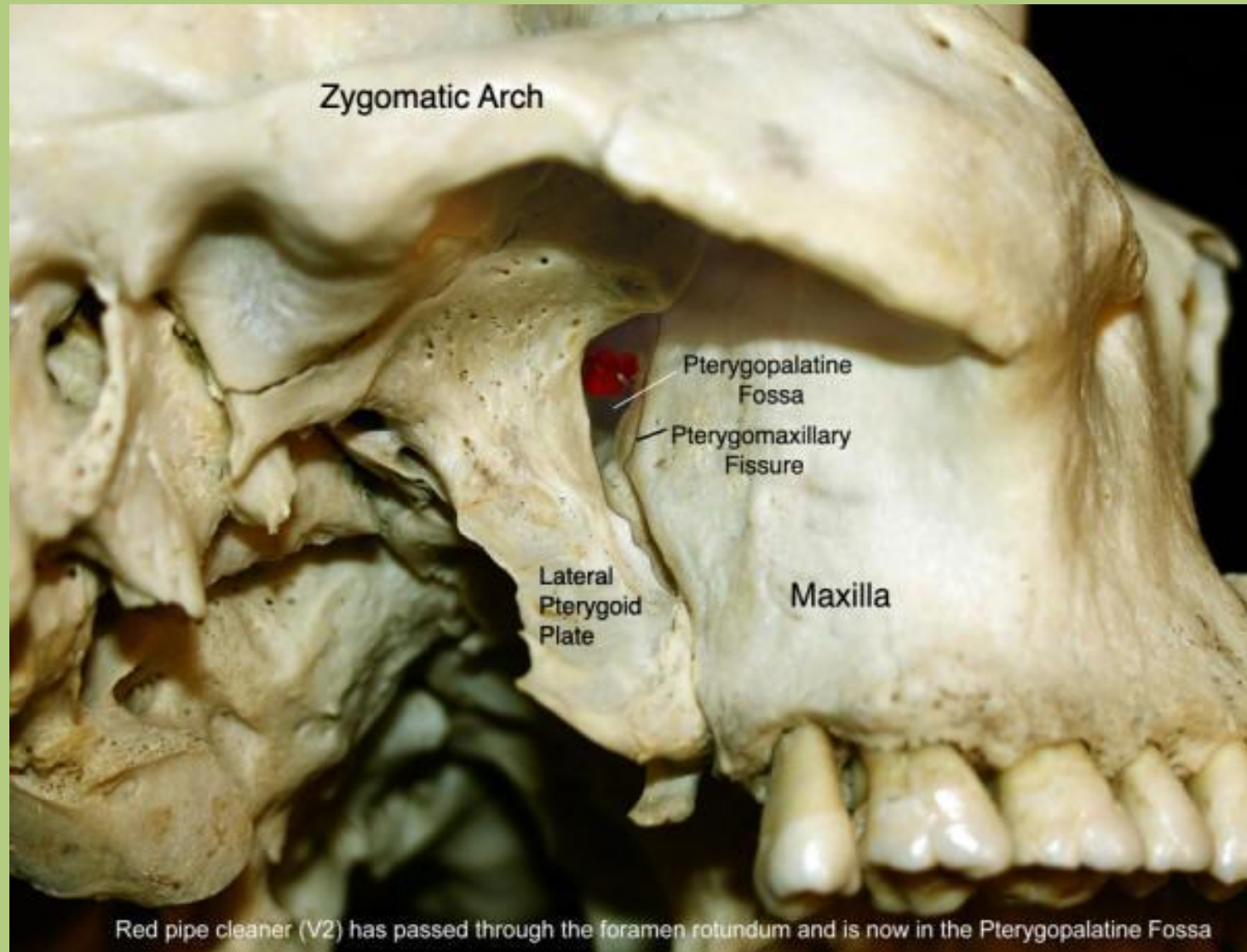
Pterygopalatine fossa

- **anterior wall:**
maxillary
tuberosity (1)
- **medial wall:**
perpendicular
plate of palatine
bone (2)
- **superior wall:**
greater wing of
sphenoid (3)
- **posterior wall:**
pterygoid
process (4)
- **lateral wall:**
infratemporal
fossa via the
pterygomaxillary
fissure (5)



Pterygopalatine fossa

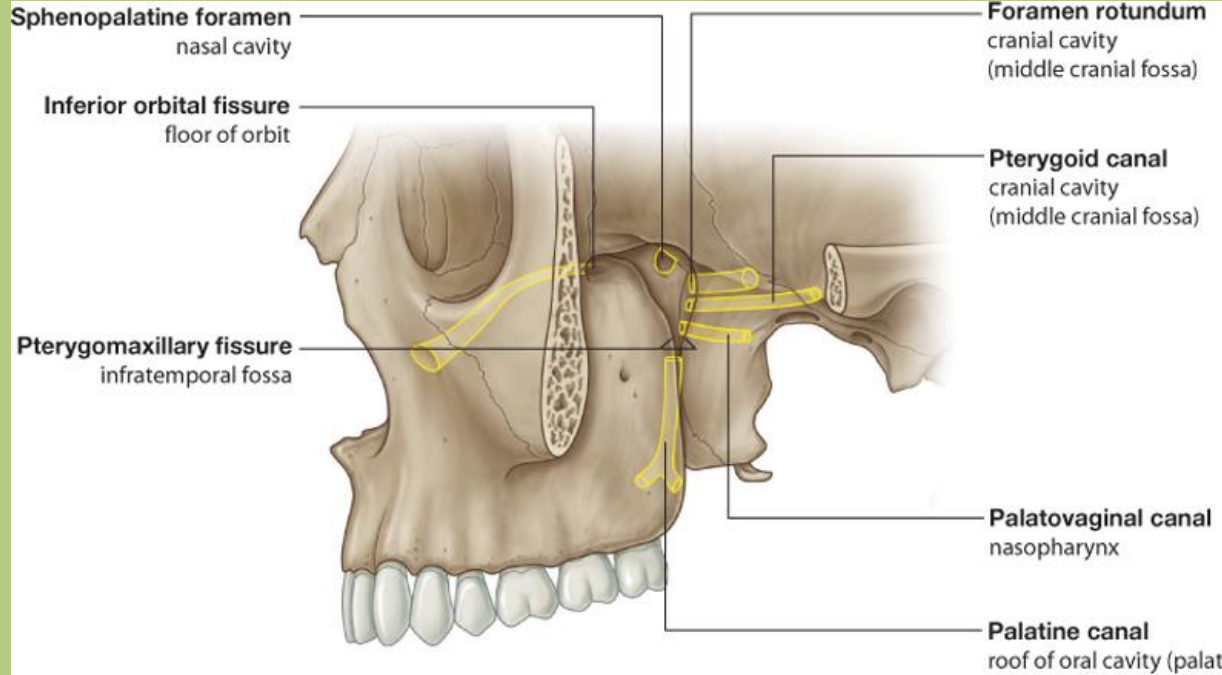
- **anterior wall:**
maxillary tuberosity
- **medial wall:**
perpendicular plate of palatine bone
- **superior wall:**
greater wing of sphenoid
- **posterior wall:**
pterygoid process
- **lateral wall:**
infratemporal fossa via the pterygomaxillary fissure



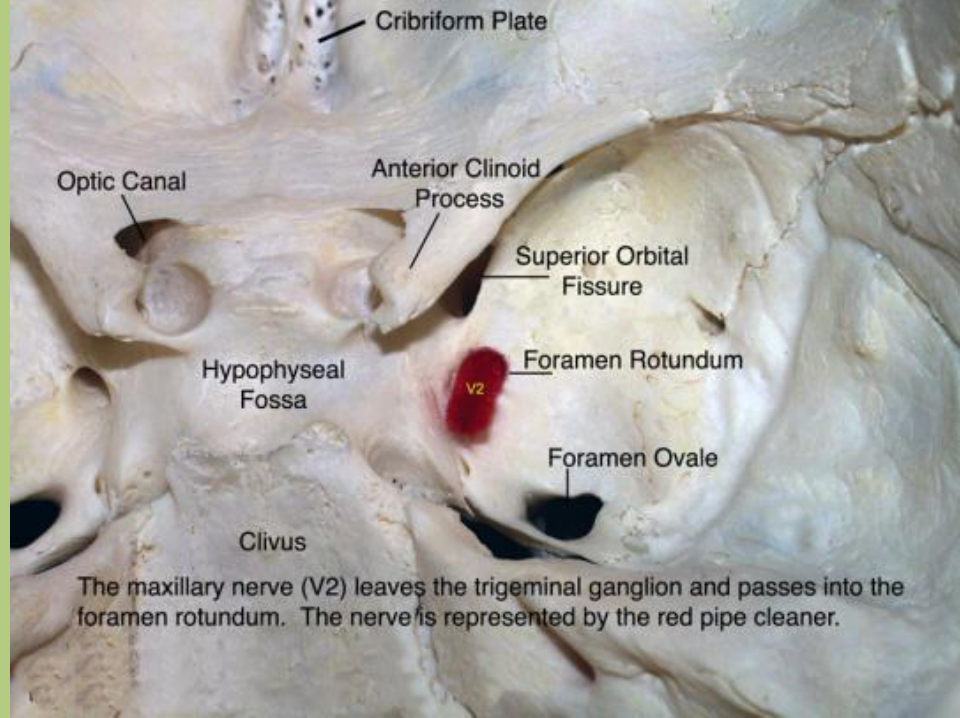
Red pipe cleaner (V2) has passed through the foramen rotundum and is now in the Pterygopalatine Fossa

Pathways to the pterygopalatine fossa

- **foramen rotundum** from the middle cranial fossa.
Content: *maxillary nerve*



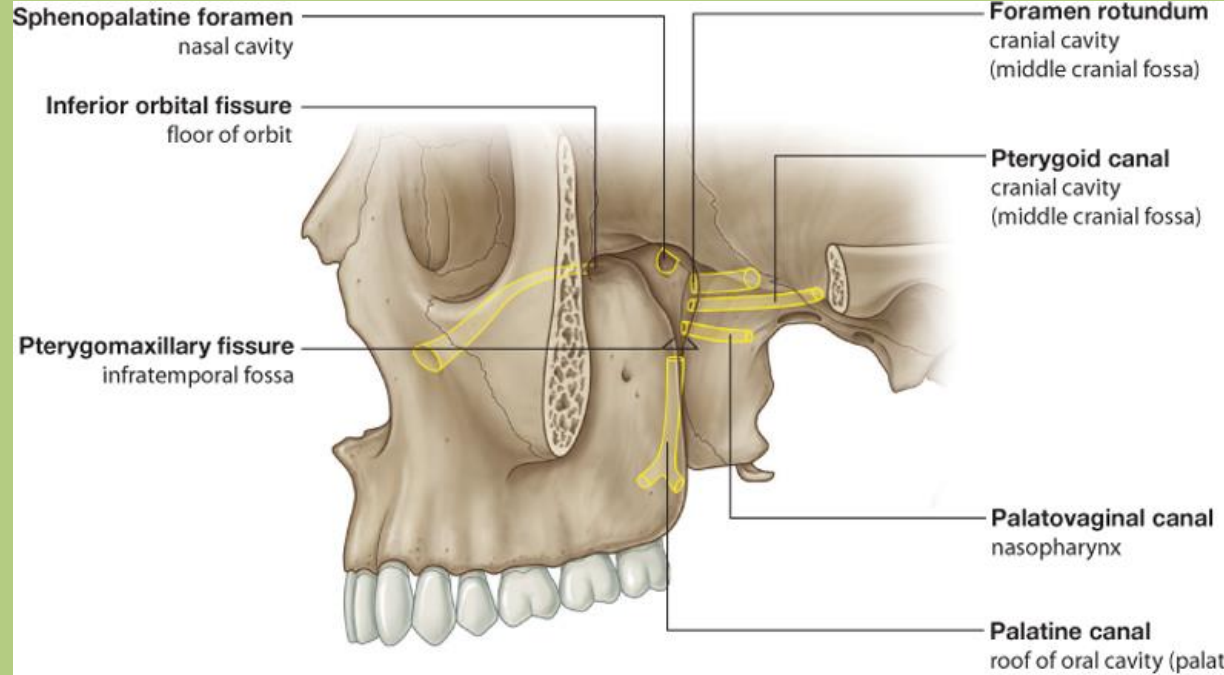
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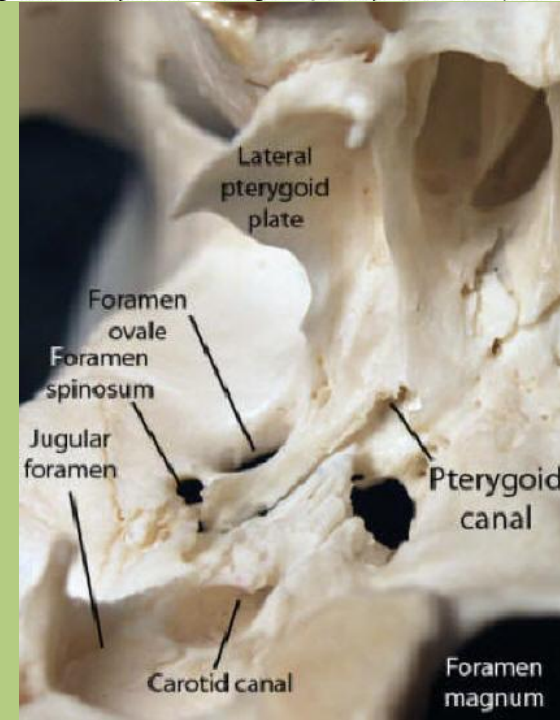
The maxillary nerve (V2) leaves the trigeminal ganglion and passes into the foramen rotundum. The nerve is represented by the red pipe cleaner.

Pathways to the pterygopalatine fossa

- **pterygoid (Vidian) canal** from the external cranial base. *Contents: greater petrosal and deep petrosal nerves, vessels of the pterygoid canal.*

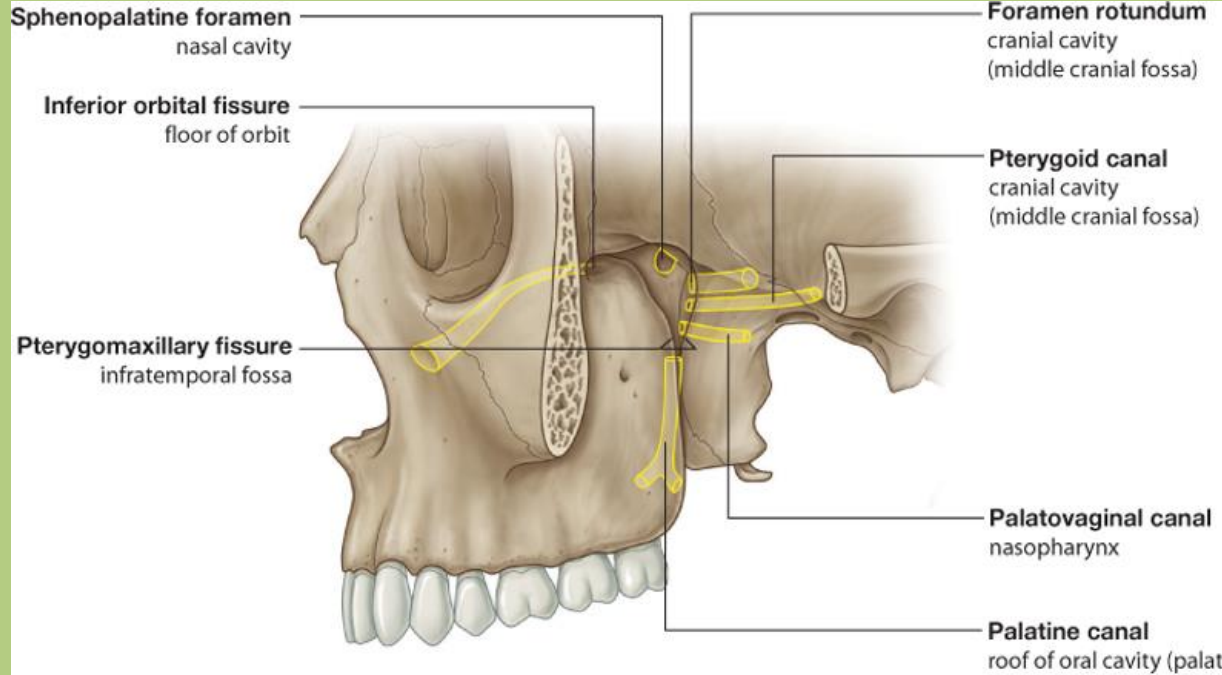


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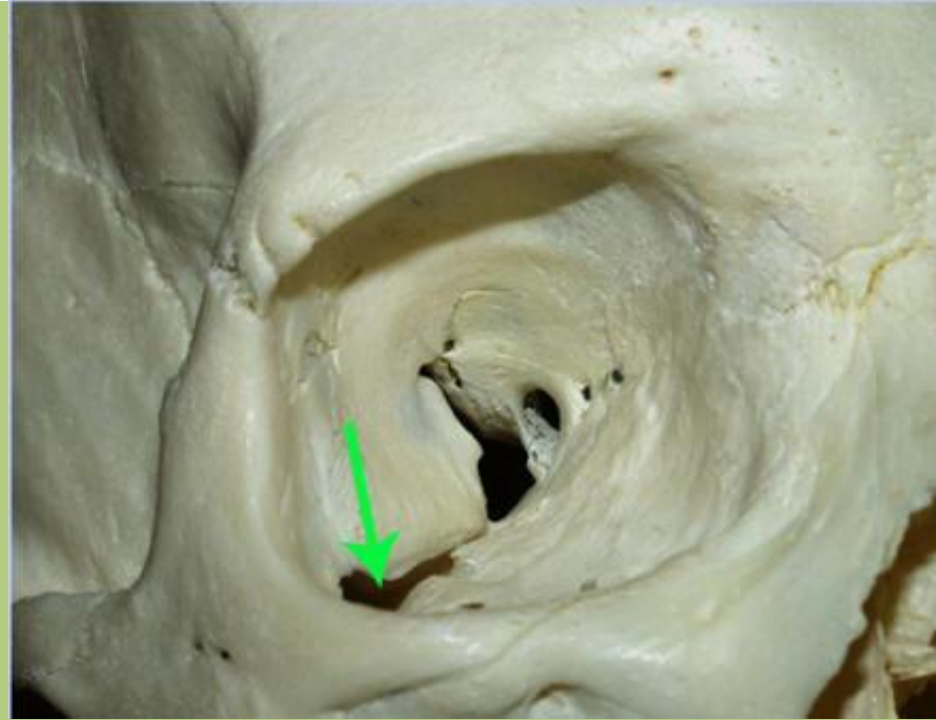


Pathways to the pterygopalatine fossa

- **inferior orbital fissure** from the orbit. **Contents:** *infraorbital nerve, zygomatic nerve, infraorbital artery and inferior ophthalmic vein*

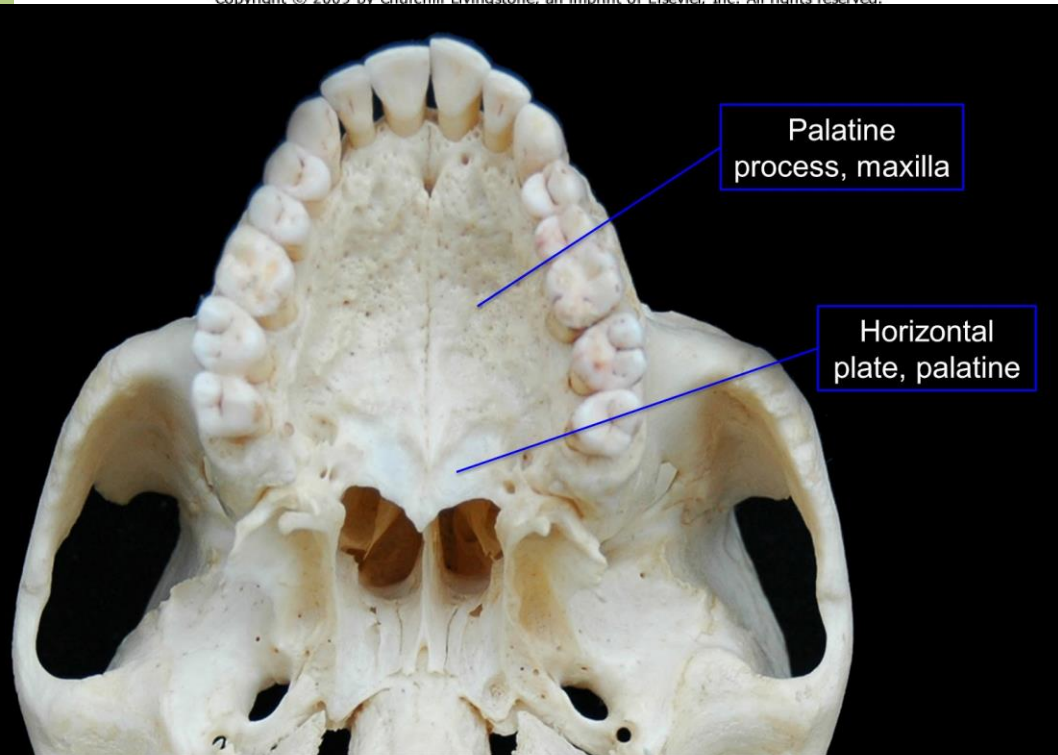
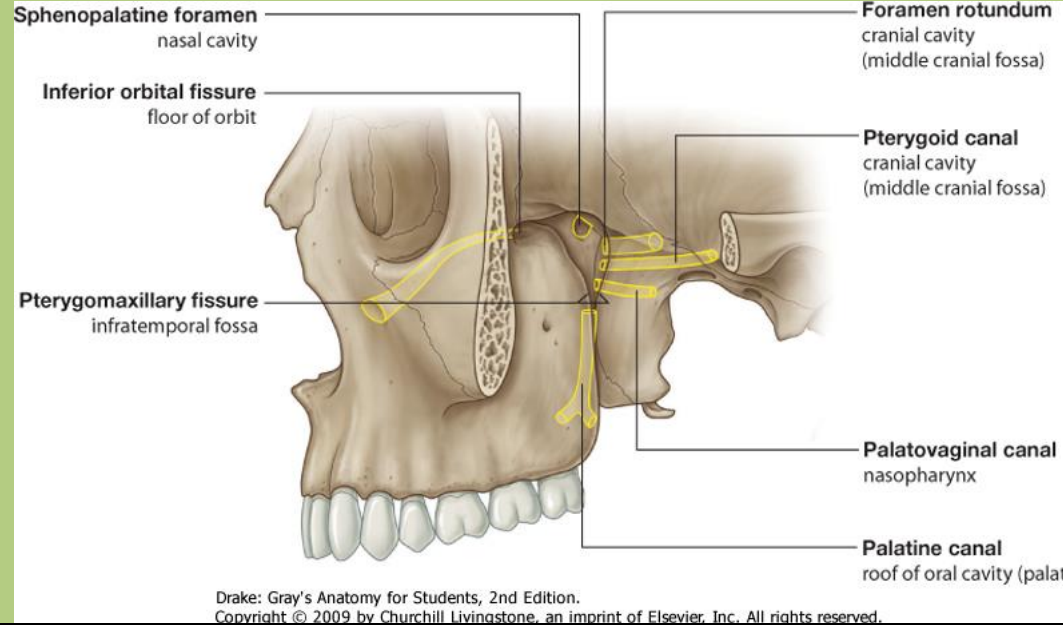


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Pathways to the pterygopalatine fossa

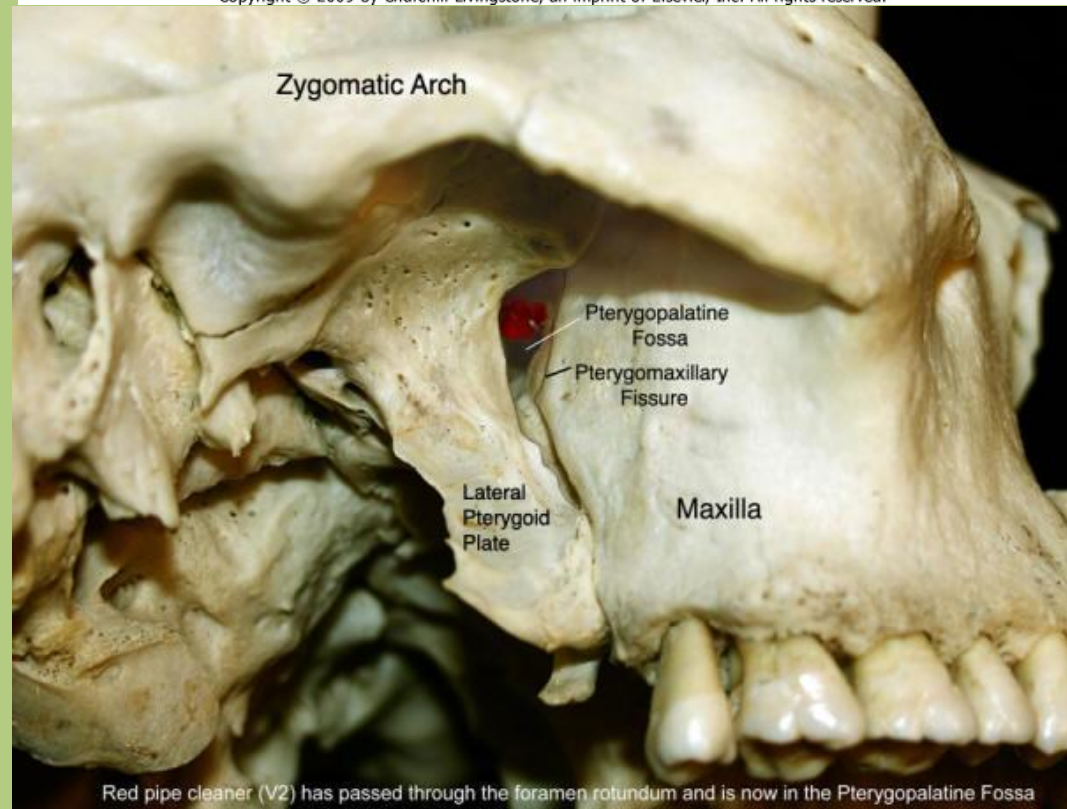
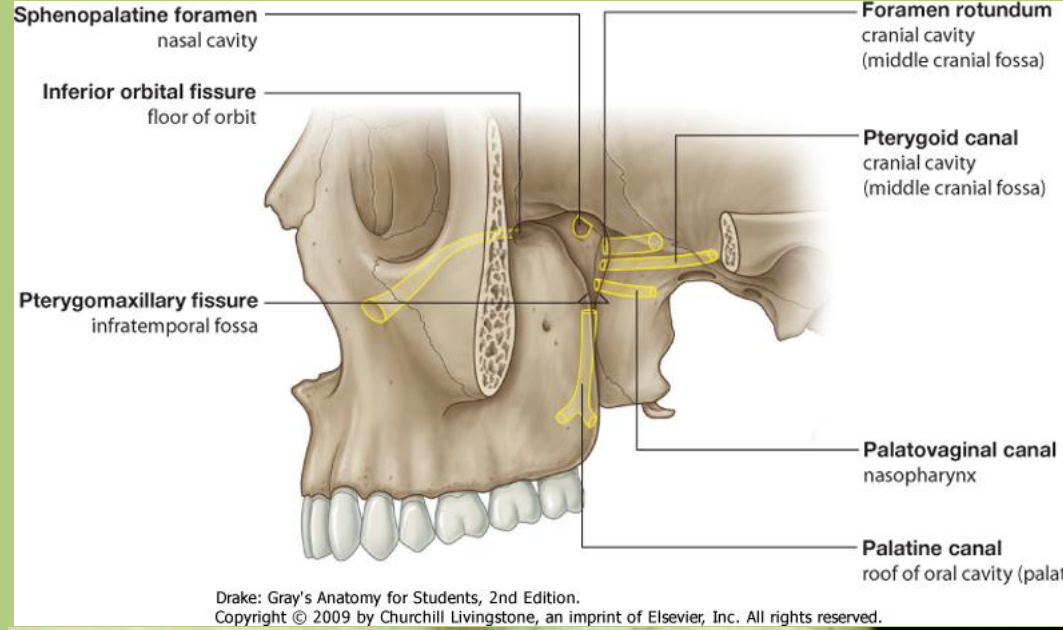
- **greater and lesser palatine canals** from the oral cavity.
Contents: greater and lesser palatine nerves, greater and lesser palatine arteries and descending palatine artery.



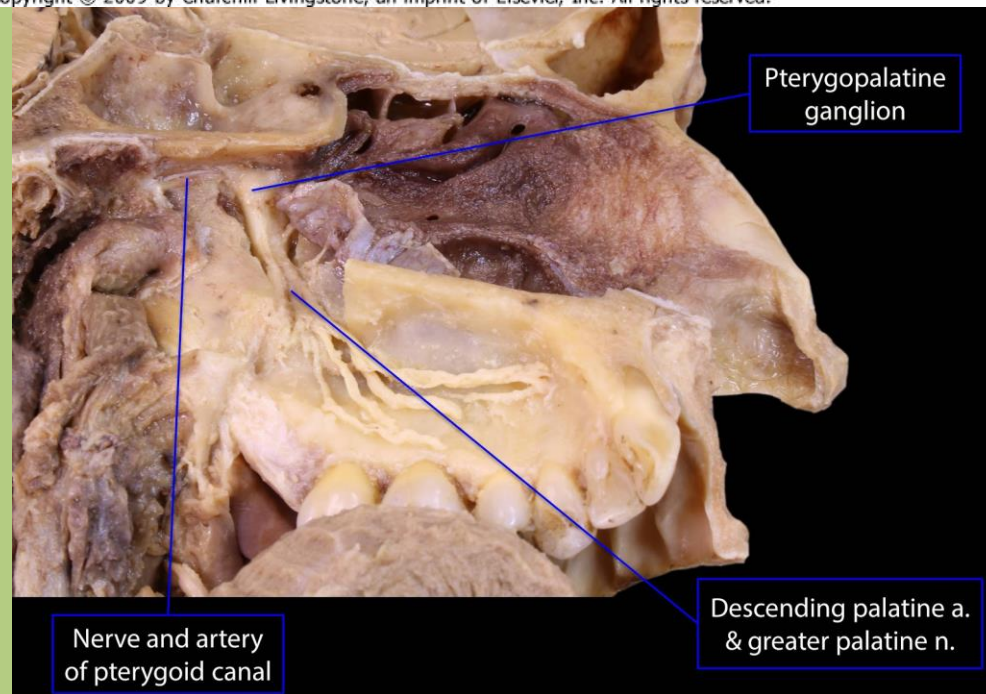
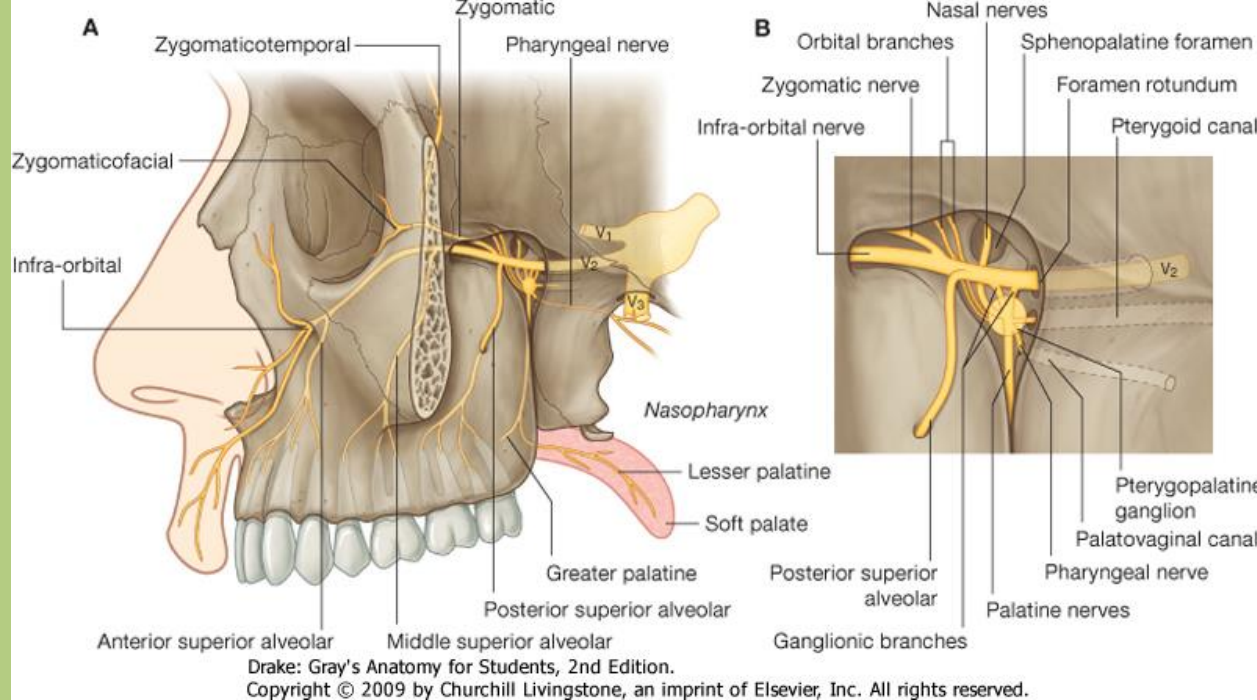
Hard palate, inferior

Pathways to the pterygopalatine fossa

- sphenopalatine foramen from the nasal cavity.
Contents: sphenopalatine artery and nasopalatine nerve.



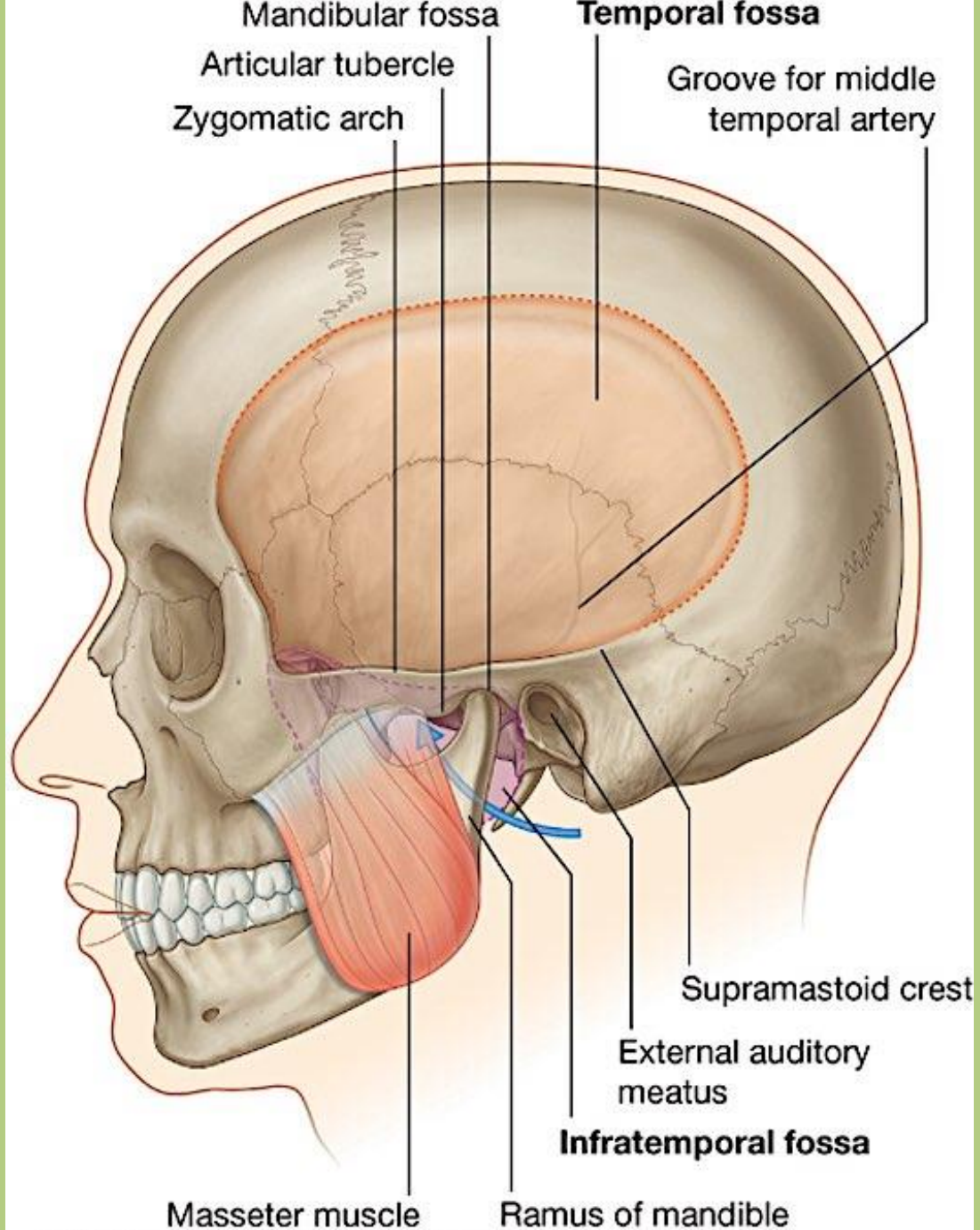
Pterygopalatine ganglion



Pterygopalatine fossa, inferomedial

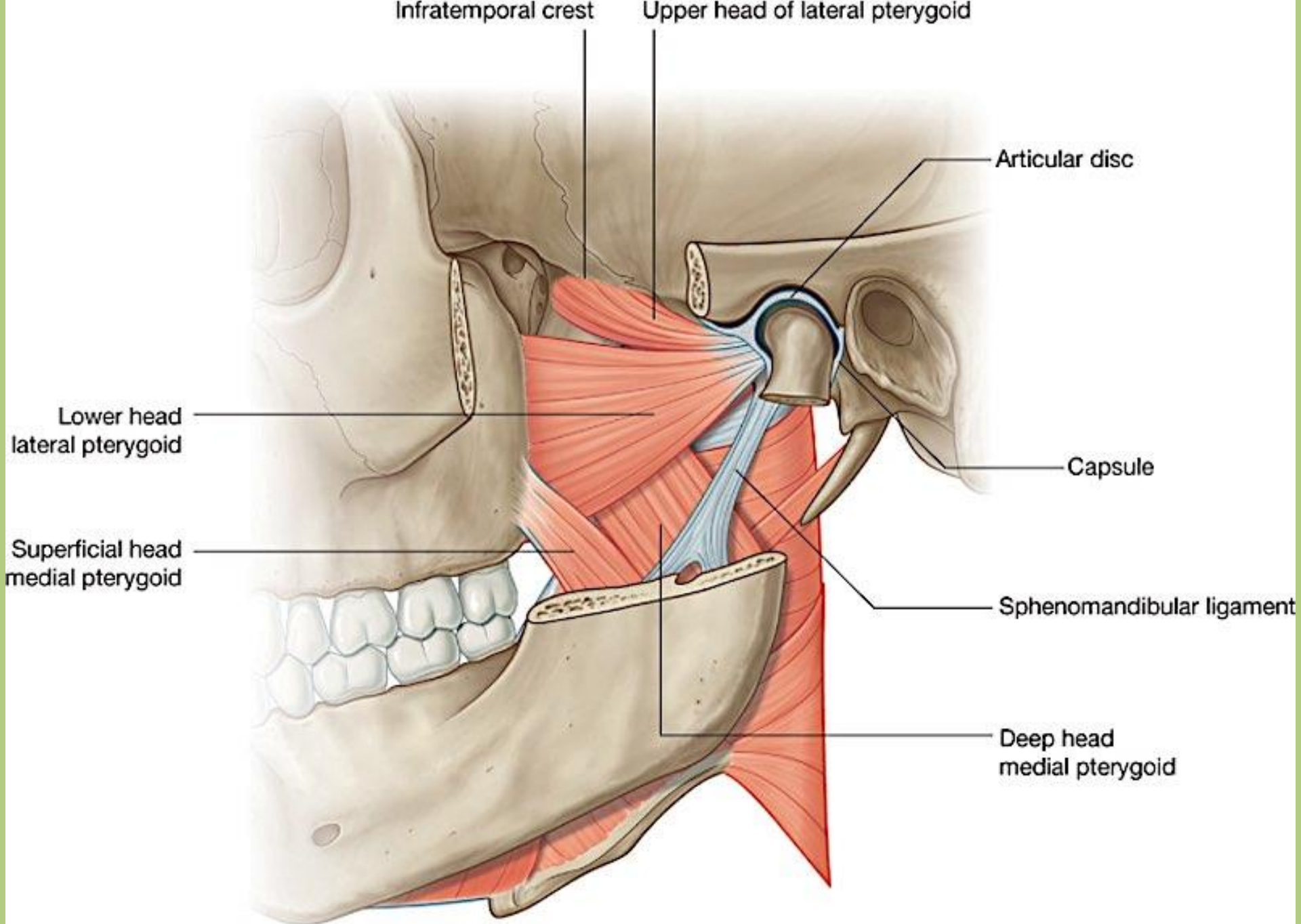
Masticatory muscles

- masseter
- medial pterygoid
- lateral pterygoid
- temporalis



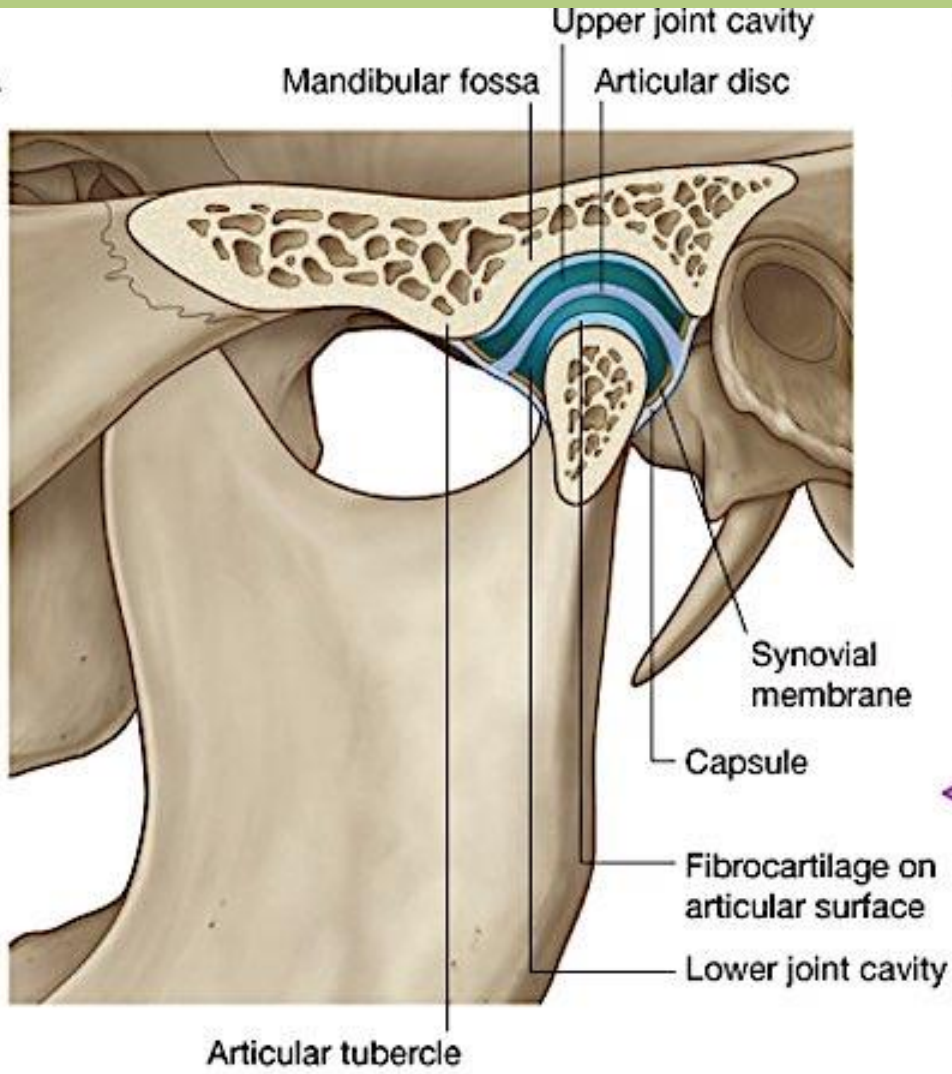
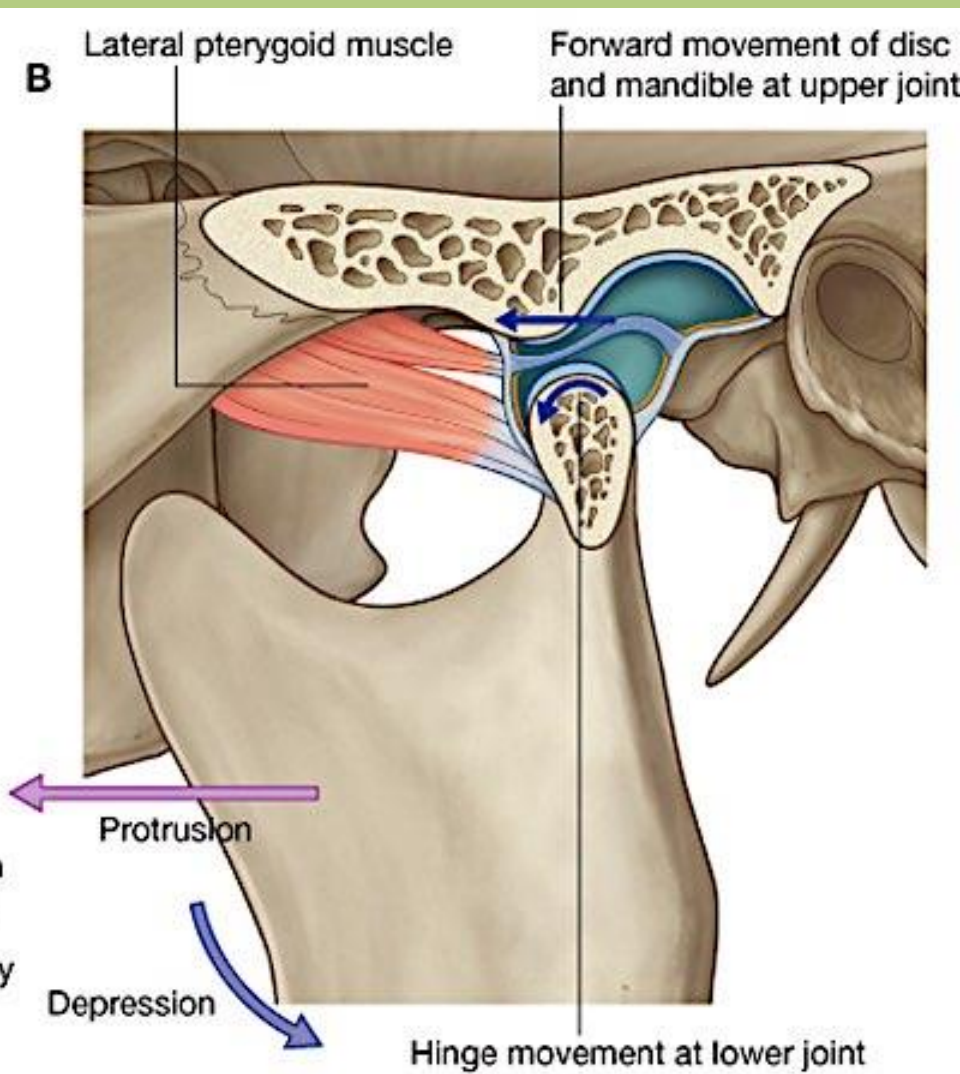
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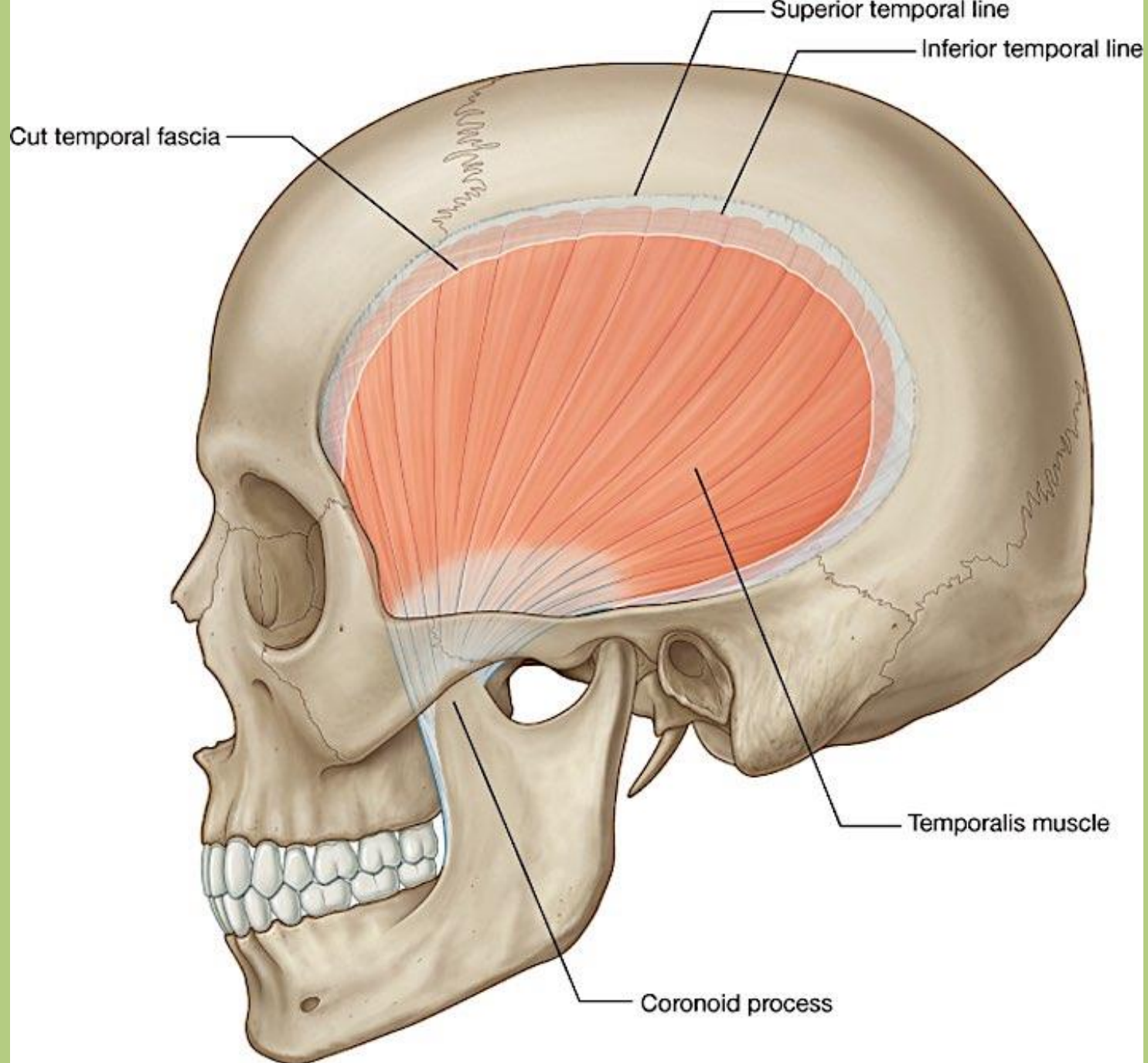


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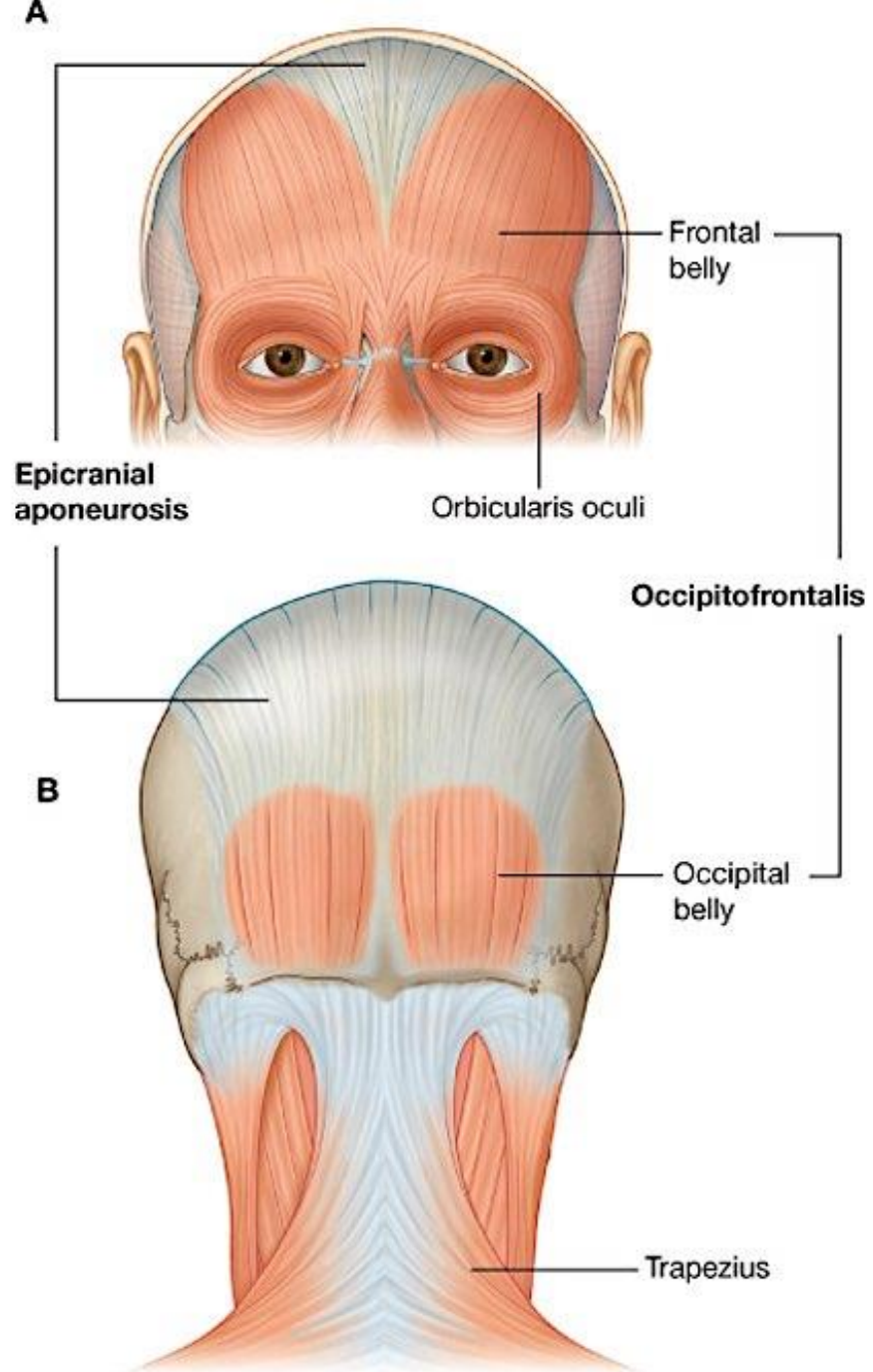
A**B**

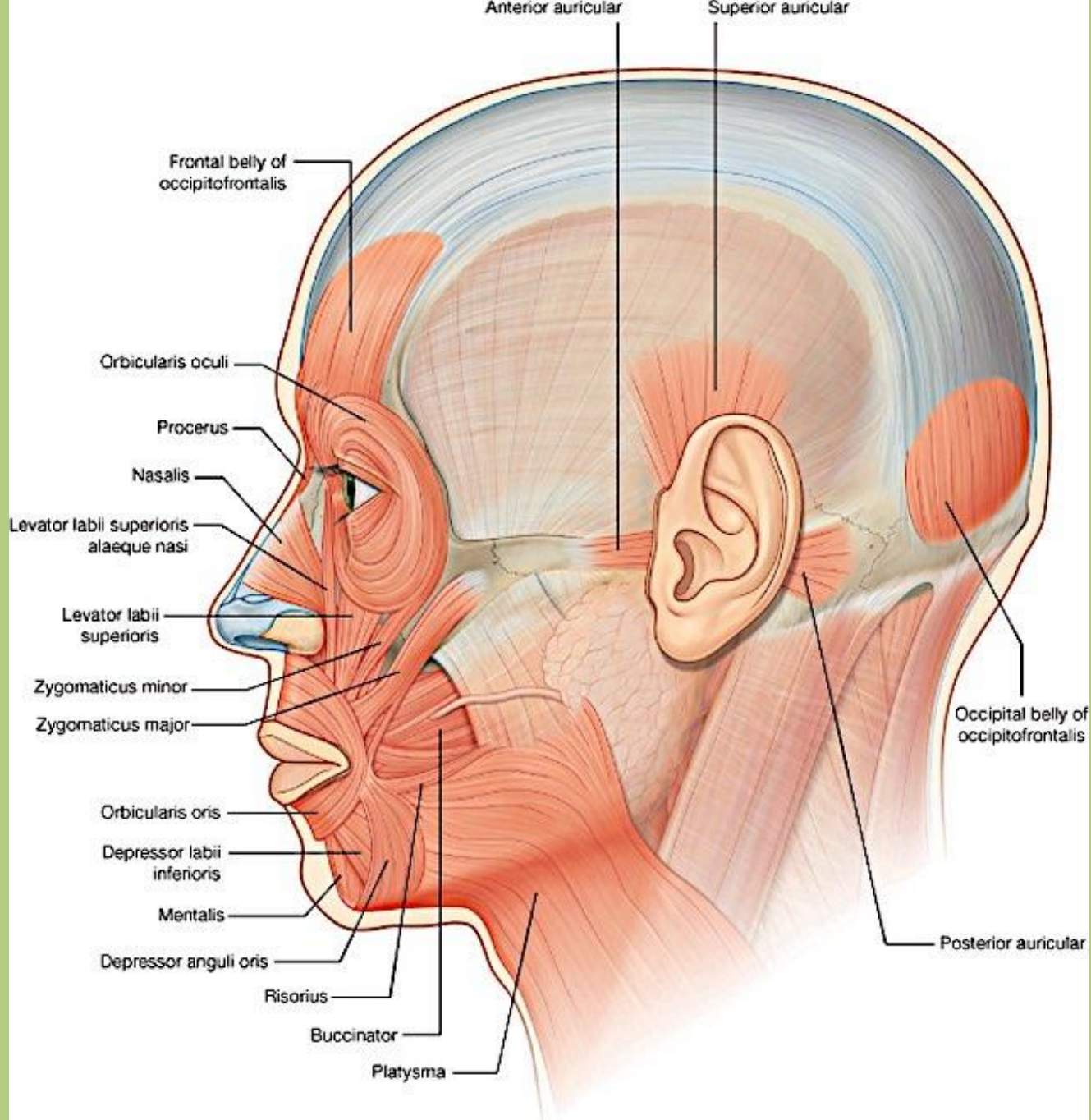
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Mimetic muscles

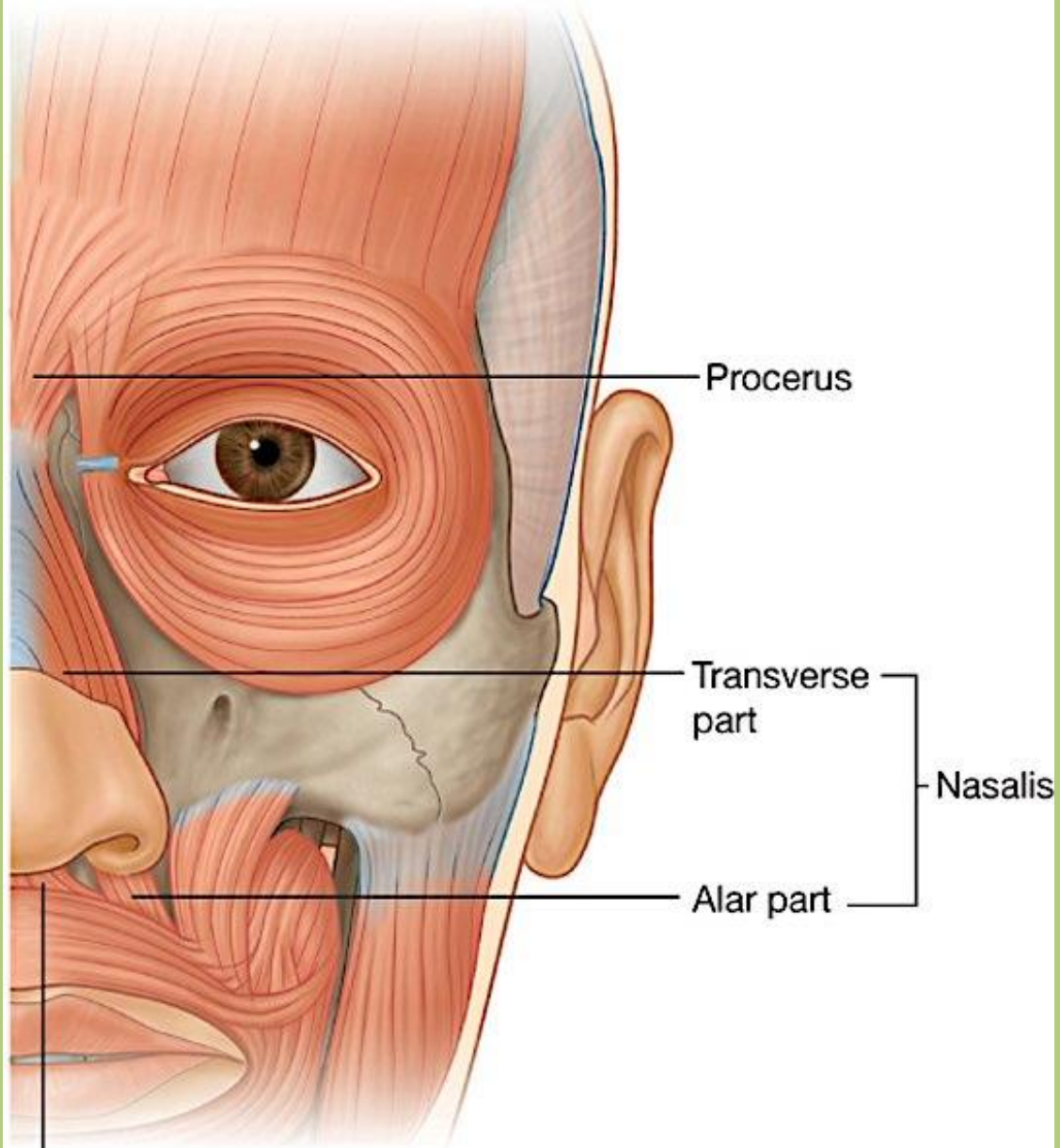
- occipitofrontalis
- procerus
- depressor supercili
- corrugator supercili
- nasalis
- orbicularis oculi
- levator labii superioris
- zygomaticus minor
- zygomaticus major
- levator anguli oris
- risorius
- buccinator
- depressor anguli oris
- depressor labii inferioris
- orbicularis oris
- mentalis
- platysma





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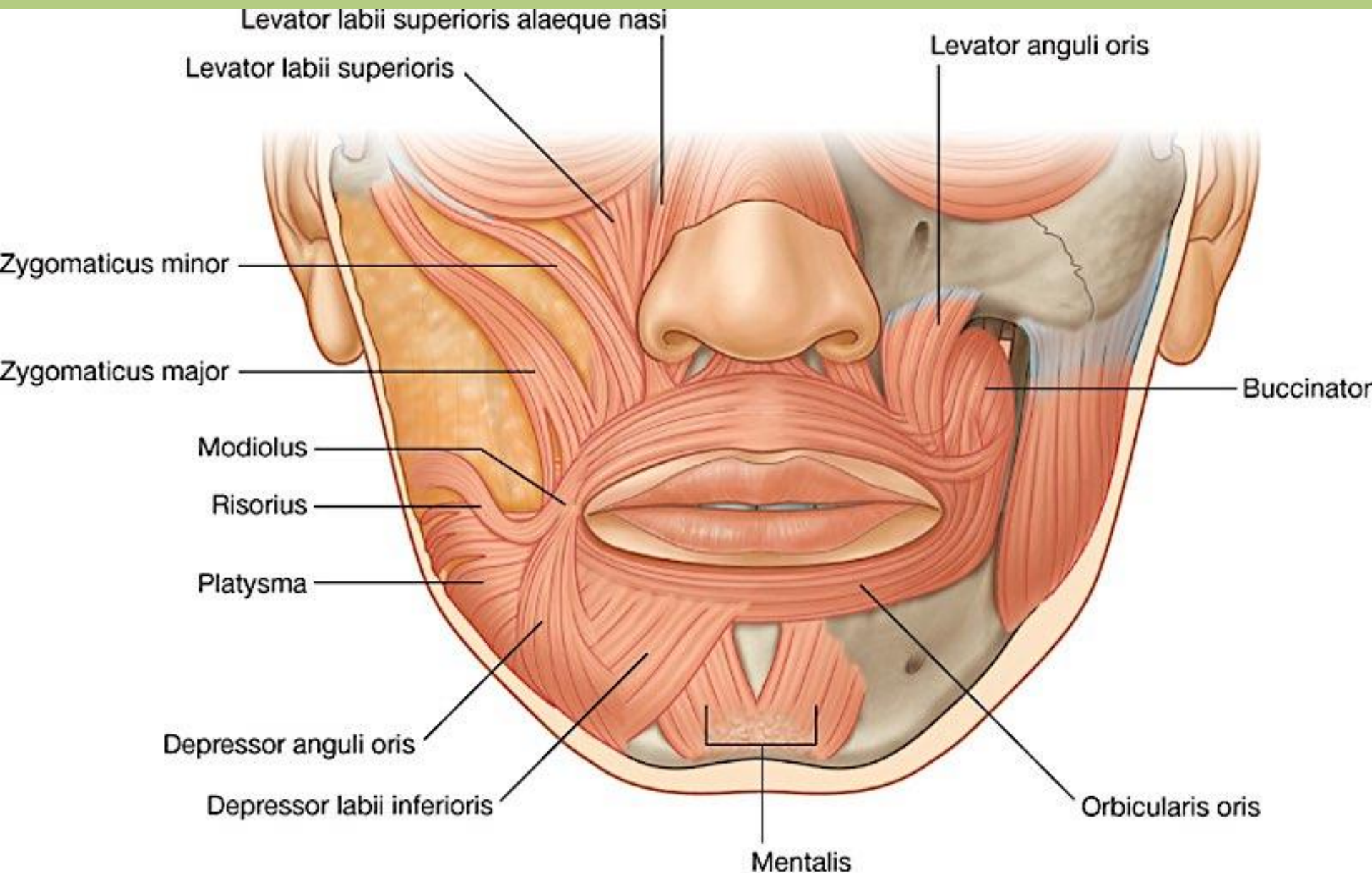
Procerus

Transverse part

Nasalis

Alar part

Depressor septi nasi



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Parotid duct (cut)

Buccinator muscle

Pterygomandibular raphe

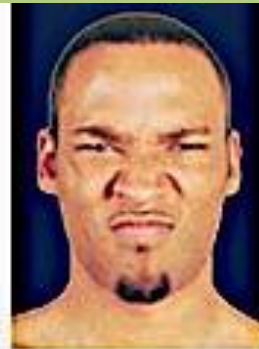
Superior pharyngeal constrictor muscle



Occipitofrontalis



Corrugator supercili



Procerus + transverse part of nasalis



Orbicularis oculi



Levator labii superioris alaeque nasi + alar part of nasalis



Buccinator + orbicularis oris



Zygomaticus major + minor



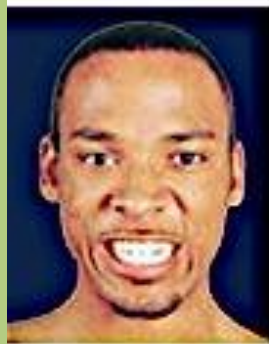
Risorius



Risorius + depressor labii inferioris



Levator labii superioris + depressor labii



Dilators of mouth



Orbicularis oris



Depressor anguli oris



Mentalis



Platysma

PLAN YOUR TREATMENT PROTOCOL



"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."

Thank you for your attention.

References: Drake: Gray's Anatomy for Students, 2nd ed.
Standring: Gray's Anatomy, 39th ed.
Radiopaedia.org
Thieme Atlas of Anatomy, General Anatomy and Musculoskeletal System, Head and Neuroanatomy 2nd ed.