

NOSE, NASAL CAVITY AND PARANASAL SINUSES

EXTERNAL NOSE:

Pyramidal

Root

Apex

External nares or nostrils

Dorsum nasi

Alae nasi

SKELETON

BONY FRAMEWORK

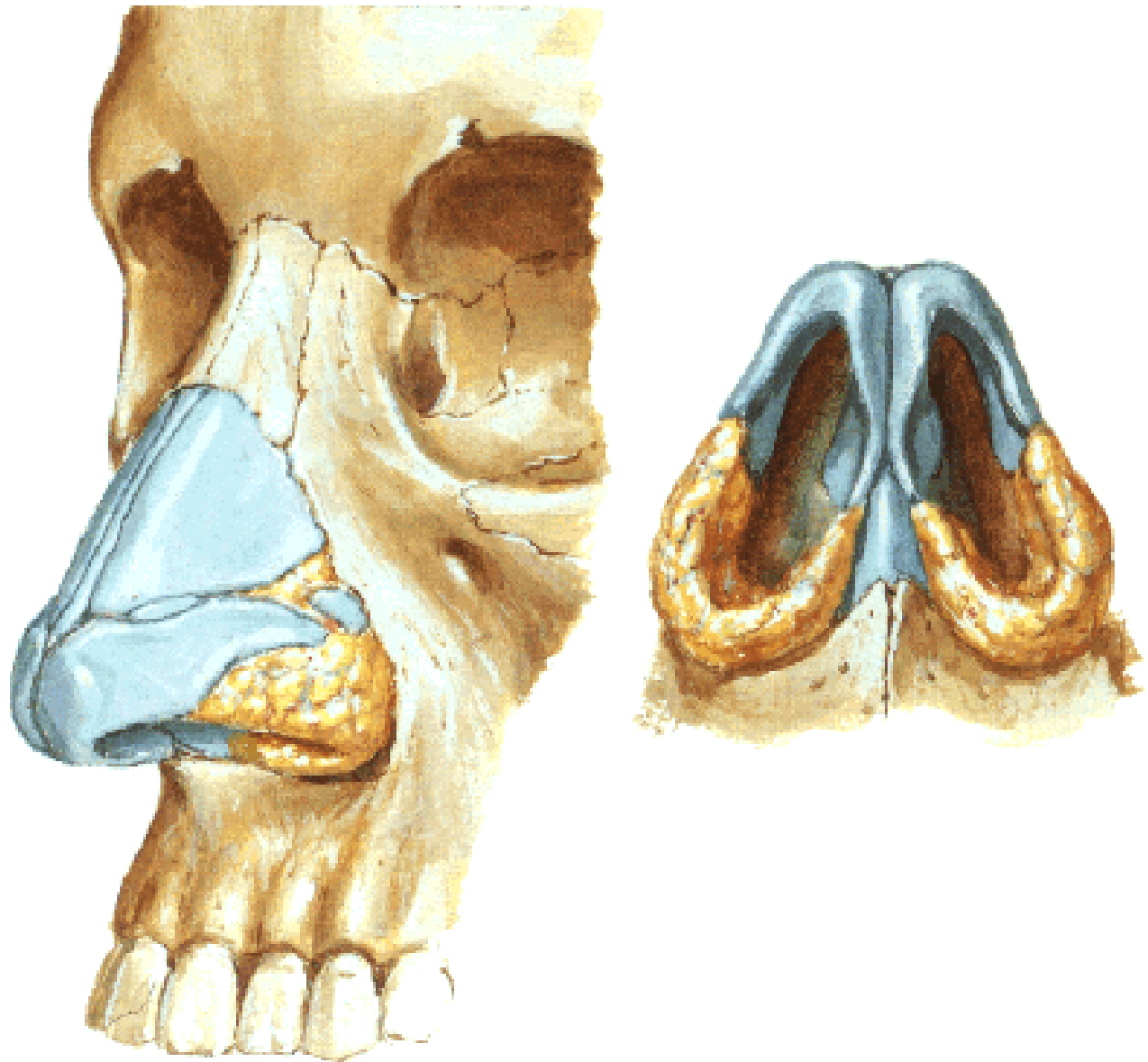
CARTILAGINOUS FRAMEWORK

BONES:

nasal bones
frontal process of maxilla
nasal part of frontal bone

CARTILAGES

septal
lateral nasal
major and
minor alar



Vessels and nerves- external nose

- **Arteries :** Facial artery- alar, septal branch
Ophthalmic artery-dorsal nasal branch
Maxillary artery- infraorbital branch

Veins : Facial , ophthalmic veins

Nerves: motor : buccal branch of facial
sensory : ophthalmic- infratrochlear branch
nasociliary – external nasal branch
infraorbital- nasal branch

NASAL CAVITY

halves- nasal septum

External nares- 1.5-2 cm

0.5-1 cm

posterior nasal apertures (choanae)– 2.5 by 1.3 cm

each half- roof

floor

medial wall

lateral wall

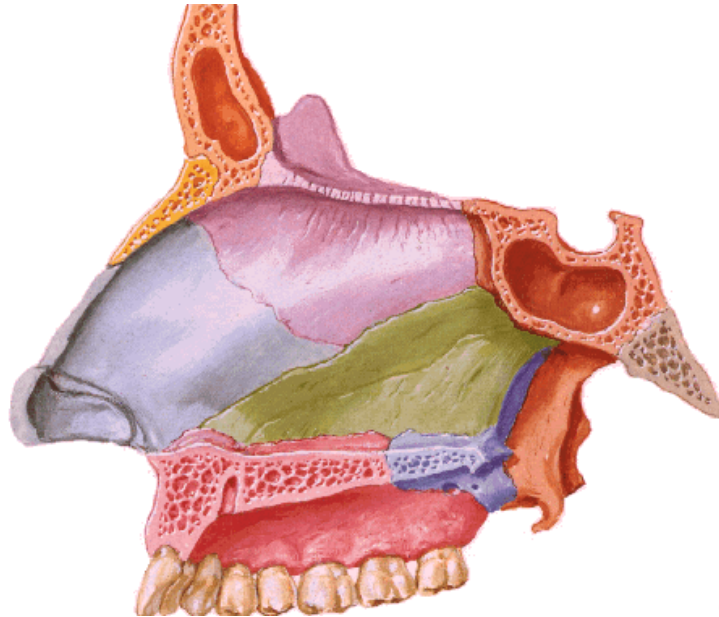
three regions- vestibule

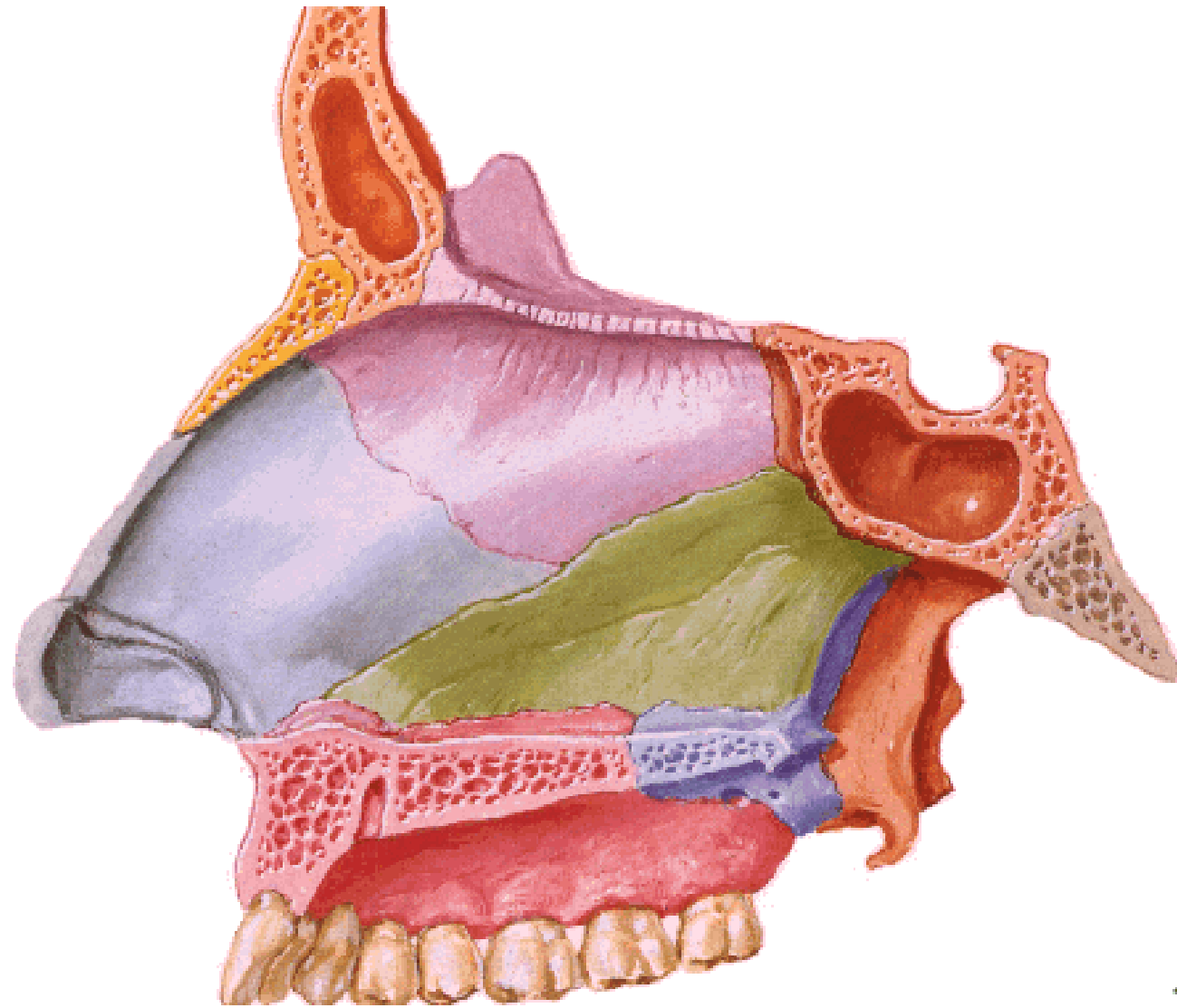
respiratory region

olfactory region

NASAL SEPTUM

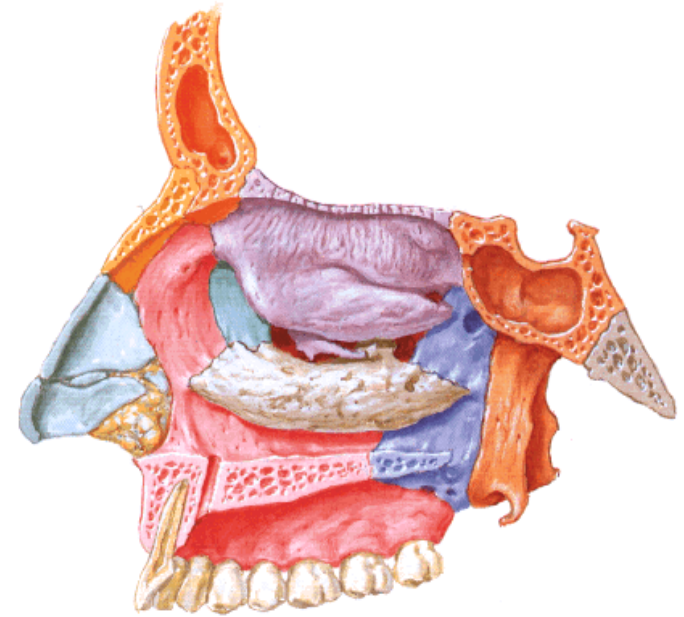
- Anterior - septal cartilage
- Vomer
- Perpendicular plate of ethmoid
- Minor contributions- nasal, frontal, sphenoid, maxilla, palatine bones
- Often deflected

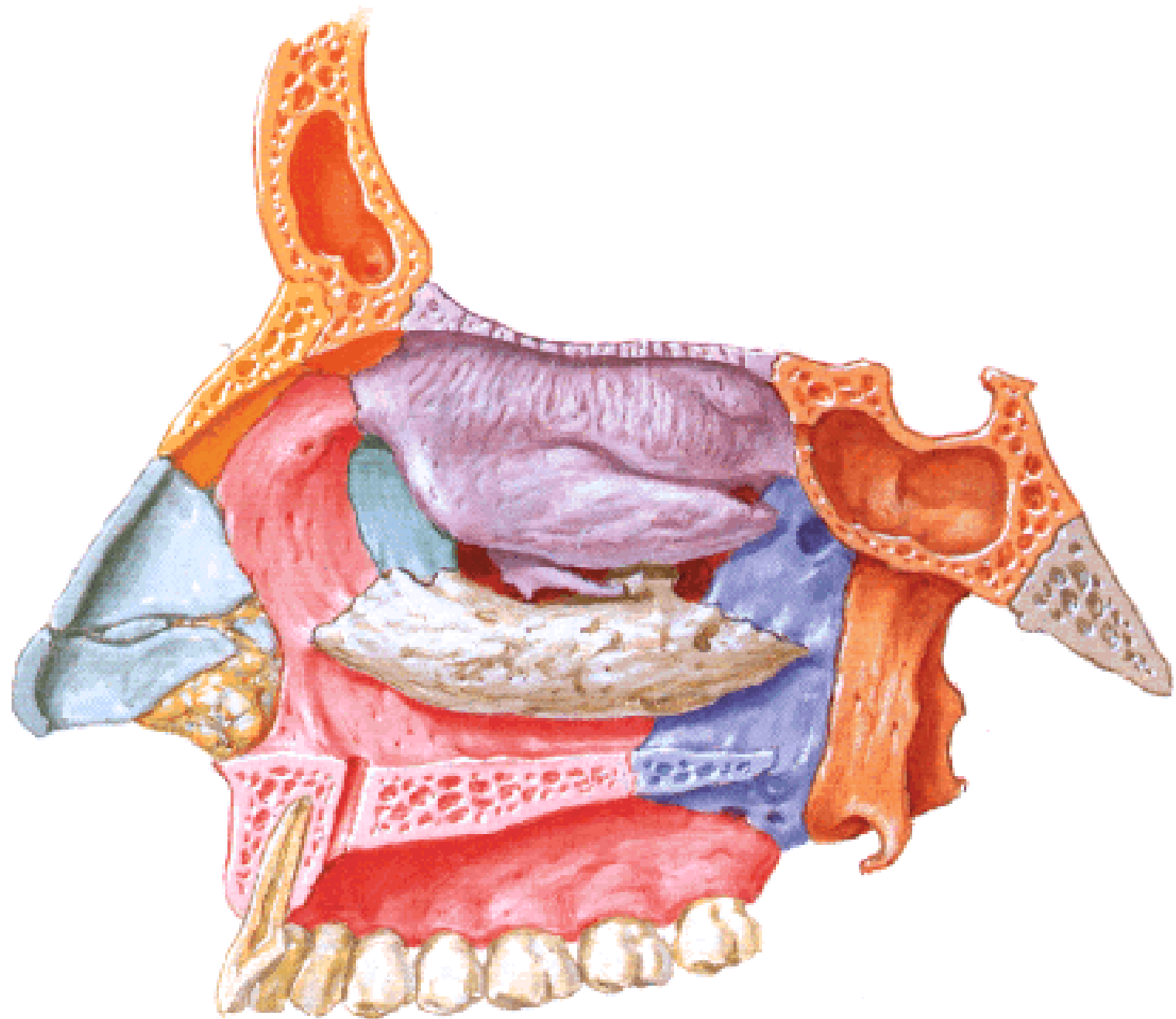


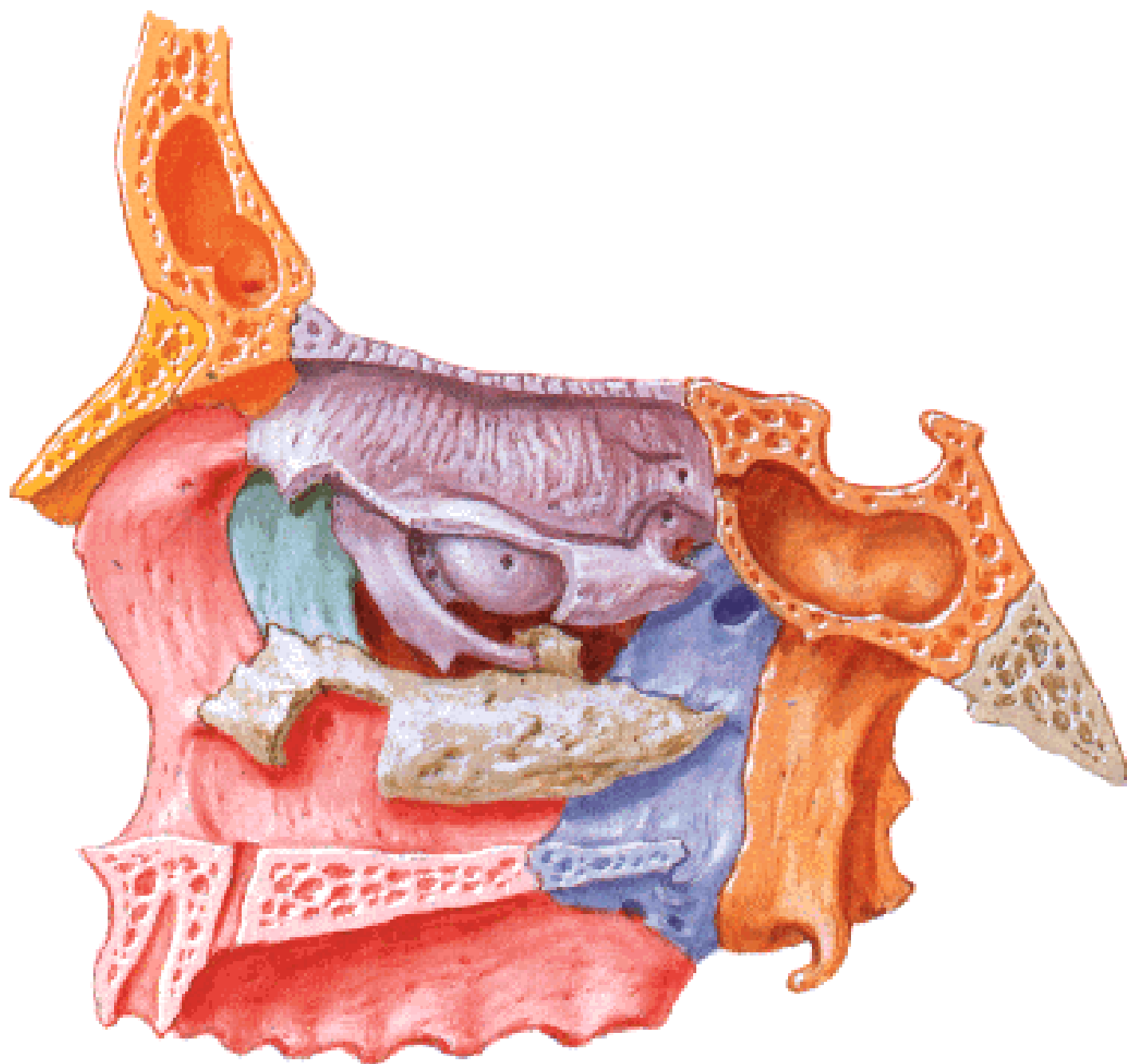


LATERAL WALL- bones

- Maxilla- anteroinferiorly
- Perpendicular plate of palatine
- Ethmoid labyrinth- superiorly
- Other bones- nasal, frontal process of maxilla, lacrimal
- Irregular- three conchae
- Superior concha- shortest, shallowest
- Middle concha- large, articulates with palatine
- On removal– ethmoidal bulla, uncinate process, ethmoid
- Inferior concha- independent bone, articulates with maxilla
- Concha suprema
- sphenopalatine foramen

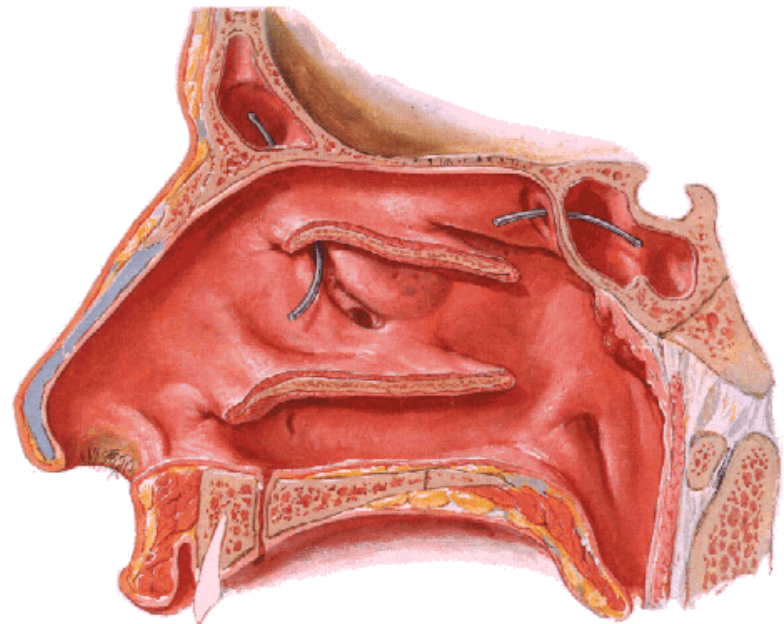


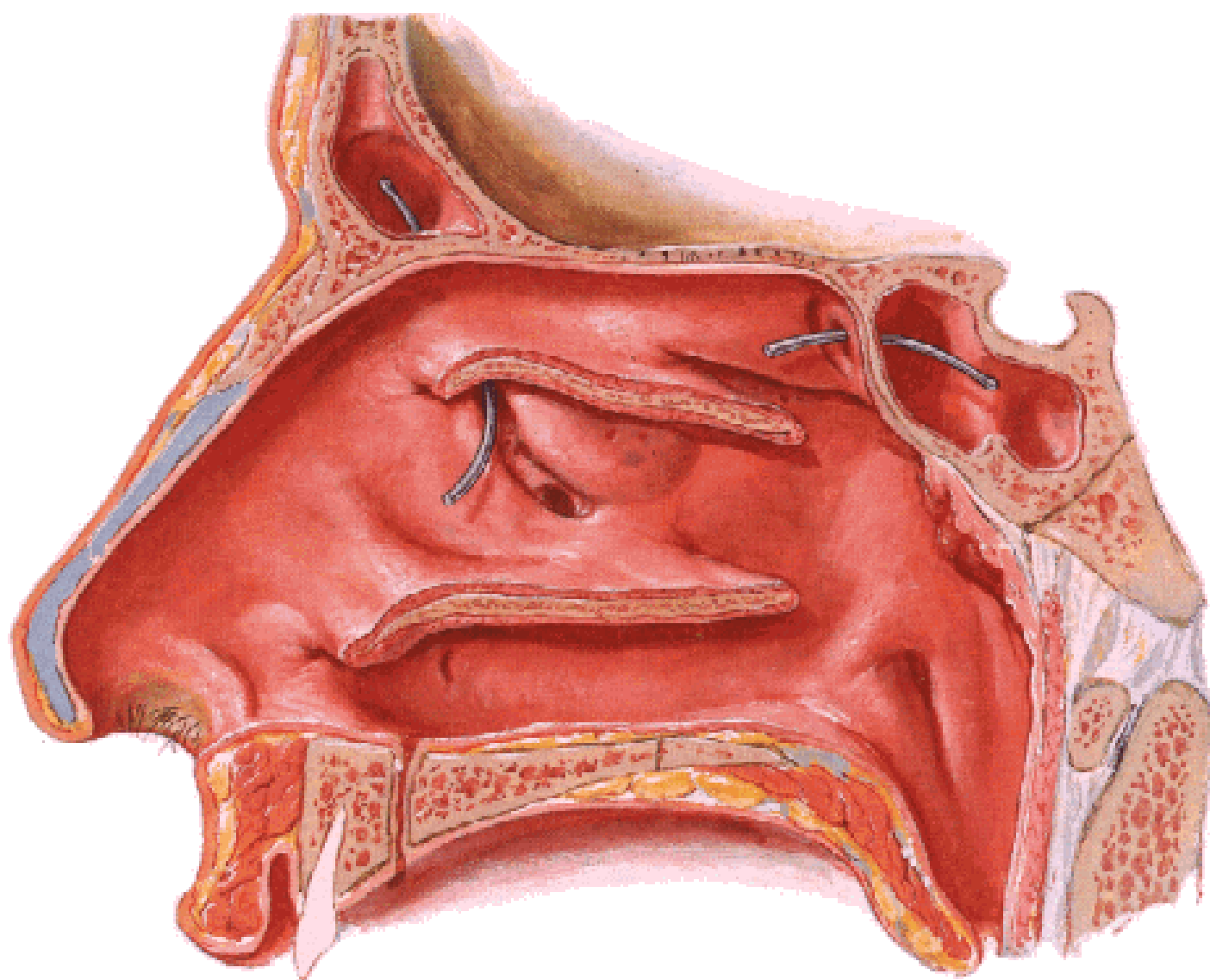




LATERAL WALL

- Corresponding meatuses
- Sphenoethmoidal recess
- Superior meatus- posterior ethmoidal cells
- Middle meatus- continues atrium of middle meatus,
- Features- bulla ethmoidalis, hiatus semilunaris, ethmoidal infundibulum
- Openings of sinuses- anterior and middle ethmoidal, frontal, maxillary
- Inferior meatus- nasolacrimal duct





NASAL ROOF AND FLOOR

- Roof
- Sphenoidal, ethmoidal and frontonasal regions
- Floor
- Transversely concave
- Palatine pr. Maxilla
- Horizontal part- palatine bone

VESSELS OF NASAL CAVITY

- SEPTUM

- Anterior, posterior ethmoidal art.
Br ophthalmic art.
- Sphenopalatine br. Maxillary art.
- Greater palatine br. Maxillary art.
- Septal br. Facial art.

- VEINS

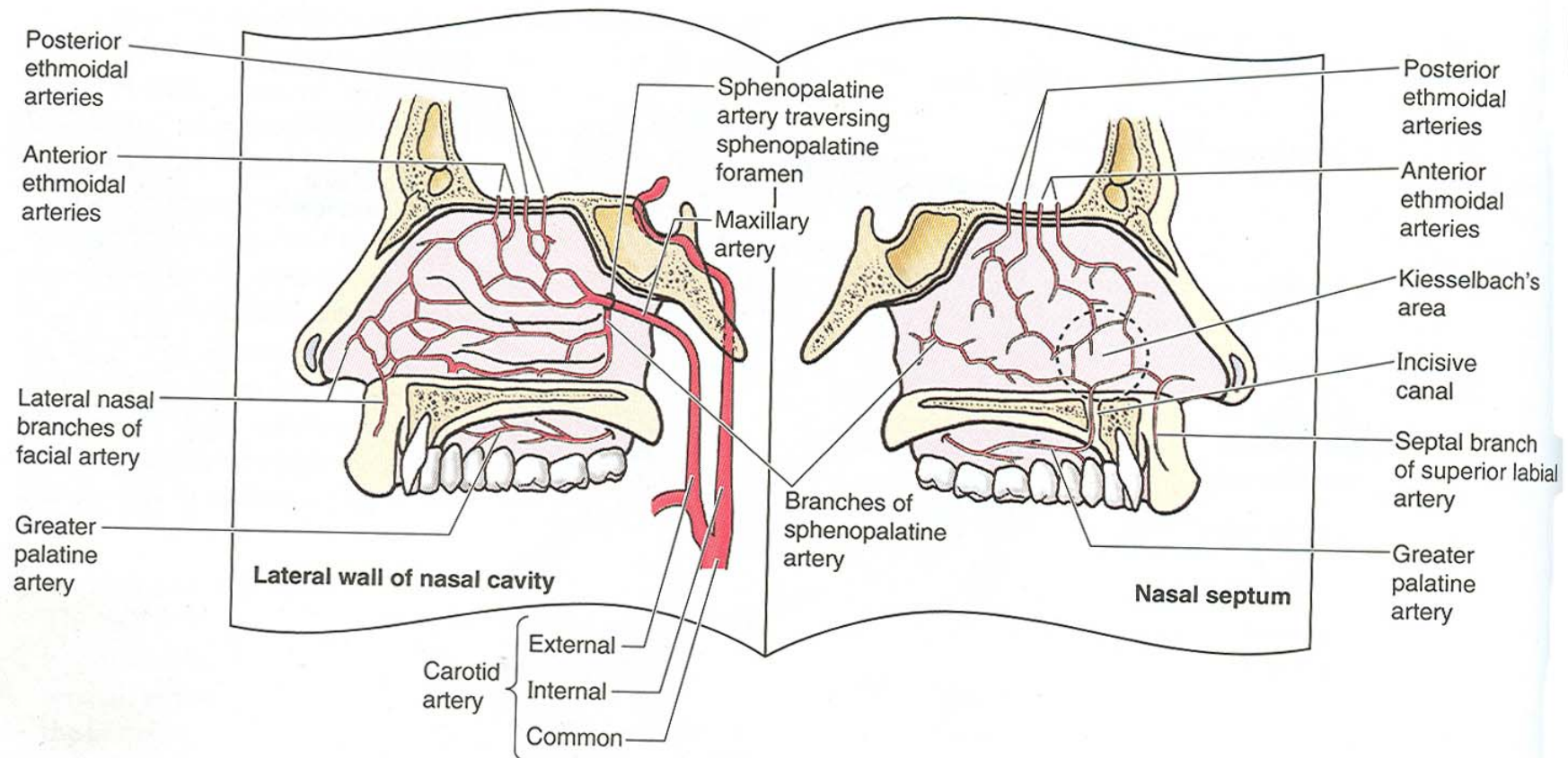
- Sphenopalatine v, facial v ,
ophthalmic v

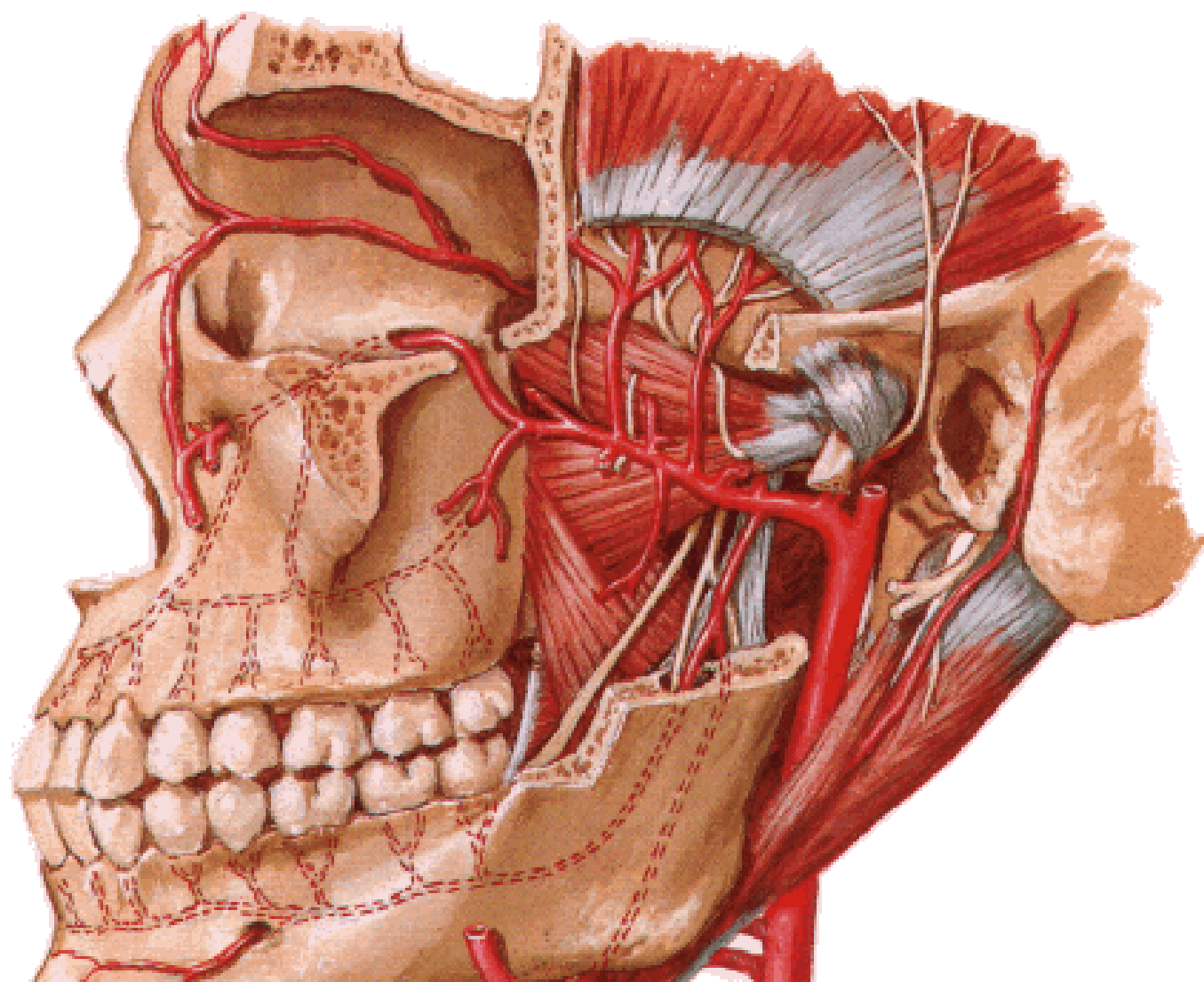
- LYMPHATIC DRAINAGE

- Submandibular nodes
- Upper deep cervical

- LATERAL WALL

- Anterior, posterior ethmoidal art.
- Sphenopalatine art.
- Lateral nasal br. Facial art.
- Greater palatine art.





NERVES

- SEPTUM

- Anterior ethmoidal br. Nasociliary
- Nasal br. Infraorbital
- Anterior superior alveolar br. Maxillary
- Medial posterior superior nasal br. Of pterygopalatine gang.

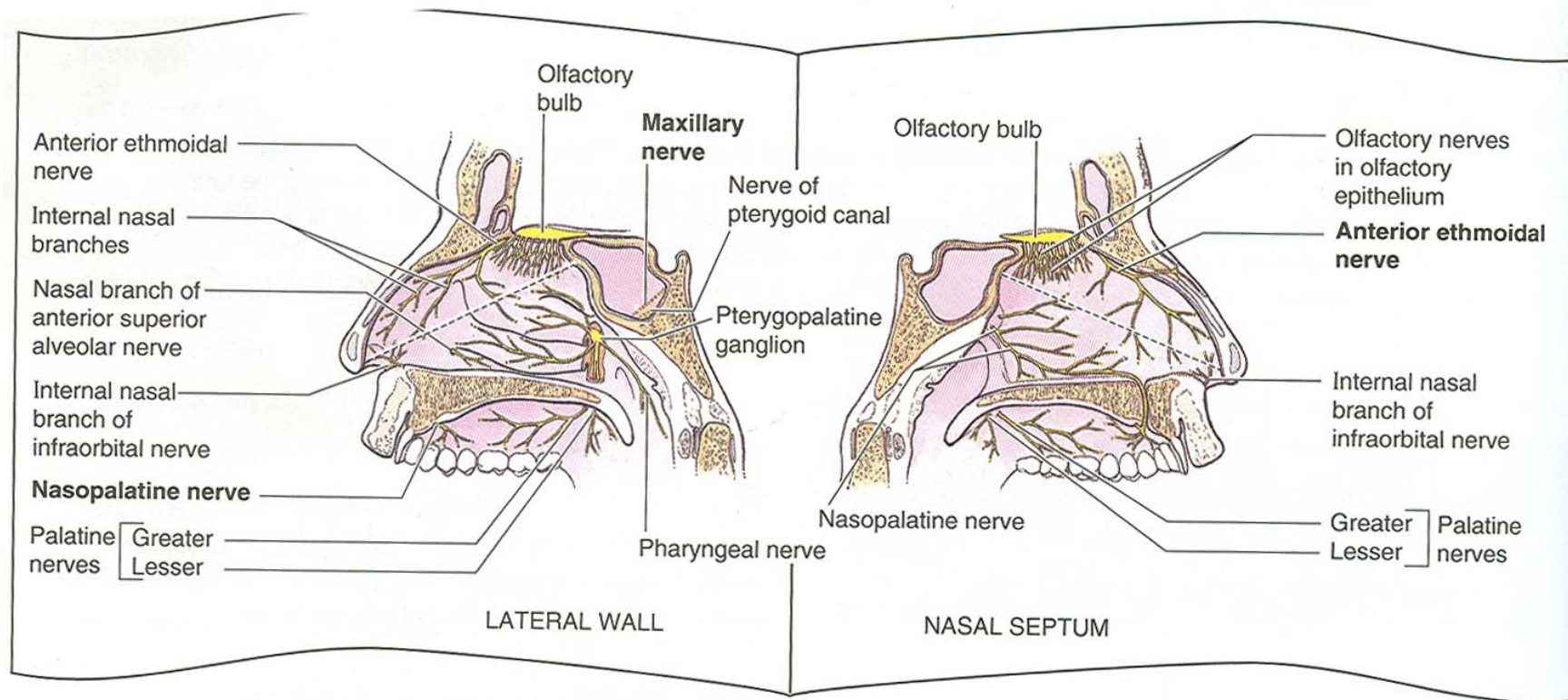
- OLFACTORY NERVE

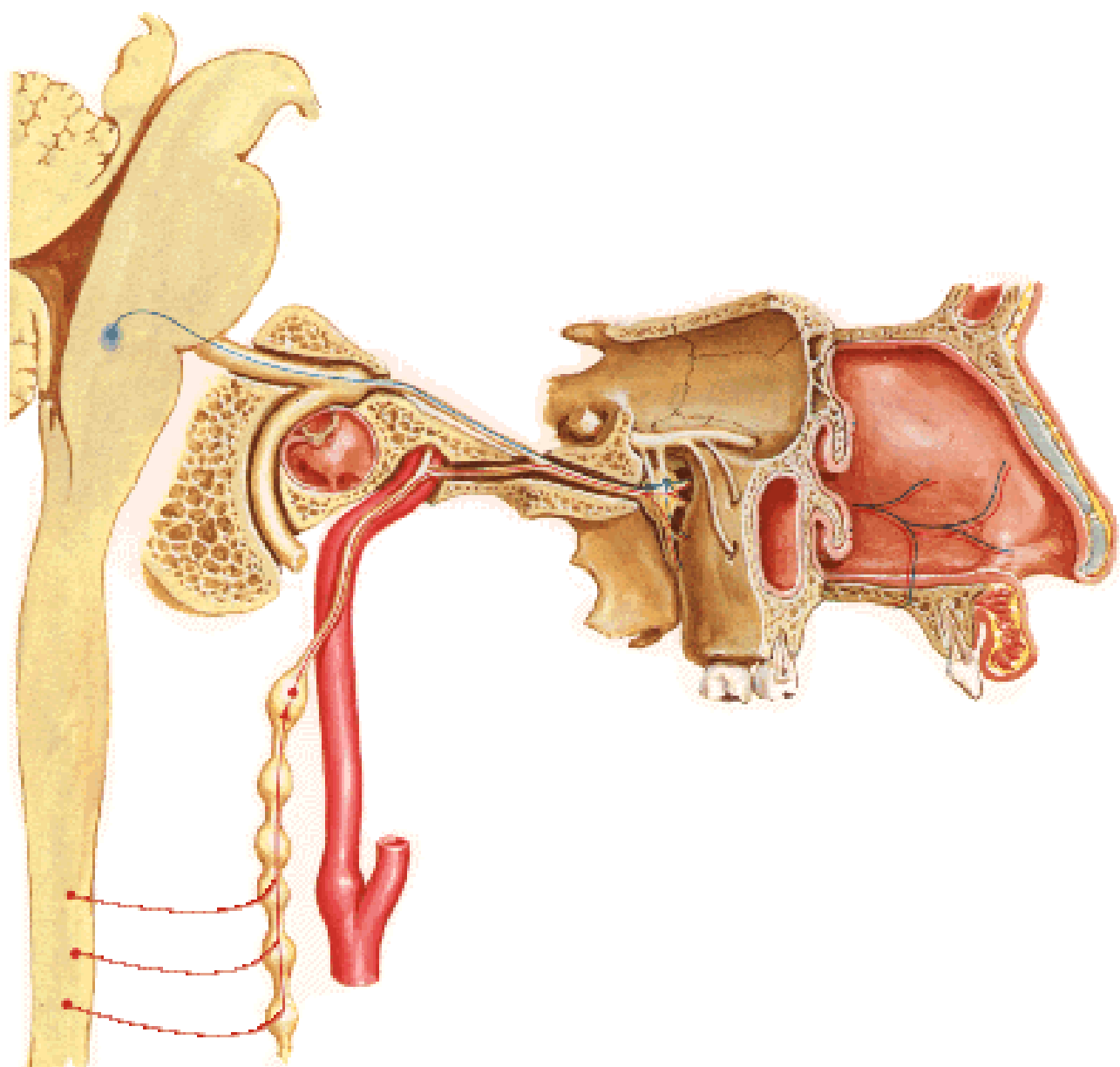
- AUTONOMIC

- Sympathetic postganglionic vasomotor
- Parasympathetic postganglionic pterygopalatine gang. nasal gl.

- LATERAL WALL

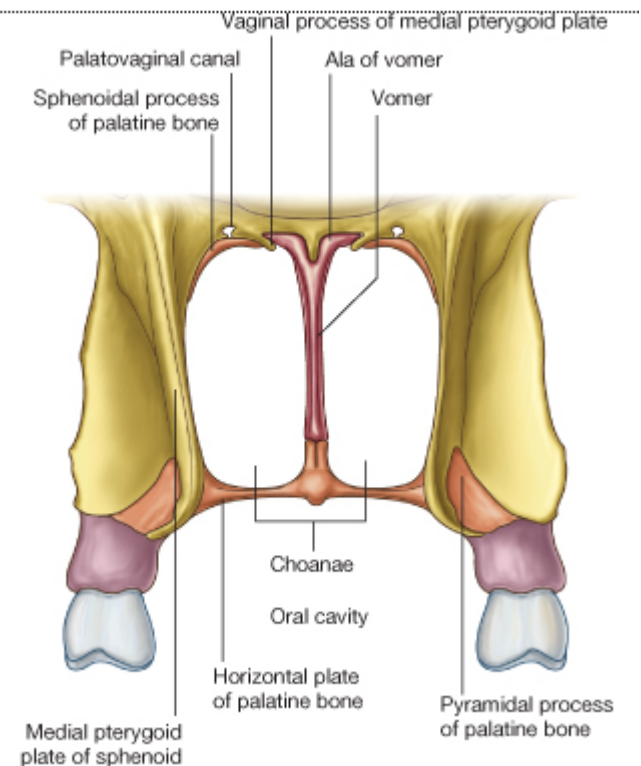
- Anterior ethmoidal br
- Anterior superior alveolar br
- lateral posterior superior nasal br. Of pterygopalatine gang.





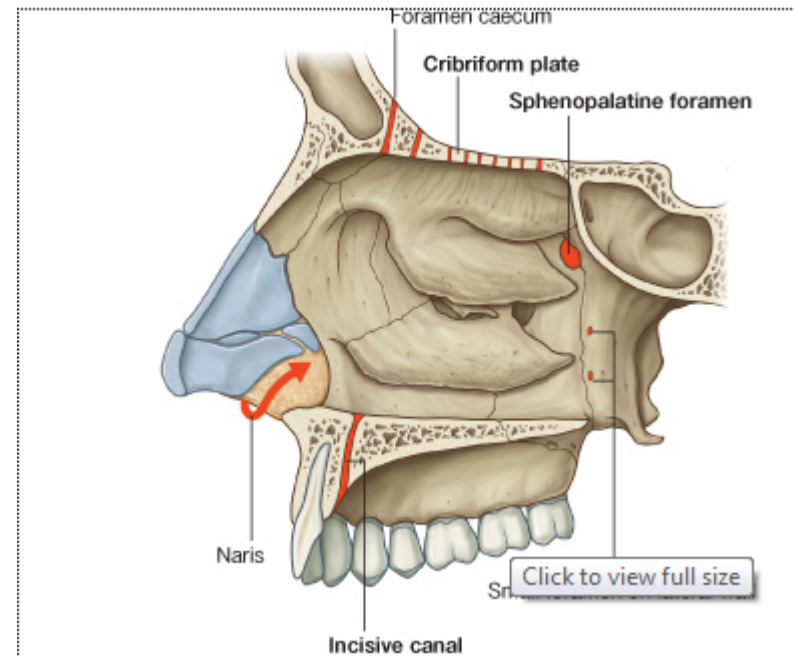
Posterior nares (choanae)

- Oval openings between nasal cavities and nasopharynx
- rigid openings completely surrounded by bone
- inferiorly, by the posterior border of the horizontal plate of the palatine bone;
- laterally, by the posterior margin of the medial plate of the pterygoid process;
- medially, by the posterior border of the vomer.
- The roof of the choanae is formed:
anteriorly by the ala of the vomer and the vaginal process of the medial plate of the pterygoid process;
posteriorly by the body of the sphenoid bone.

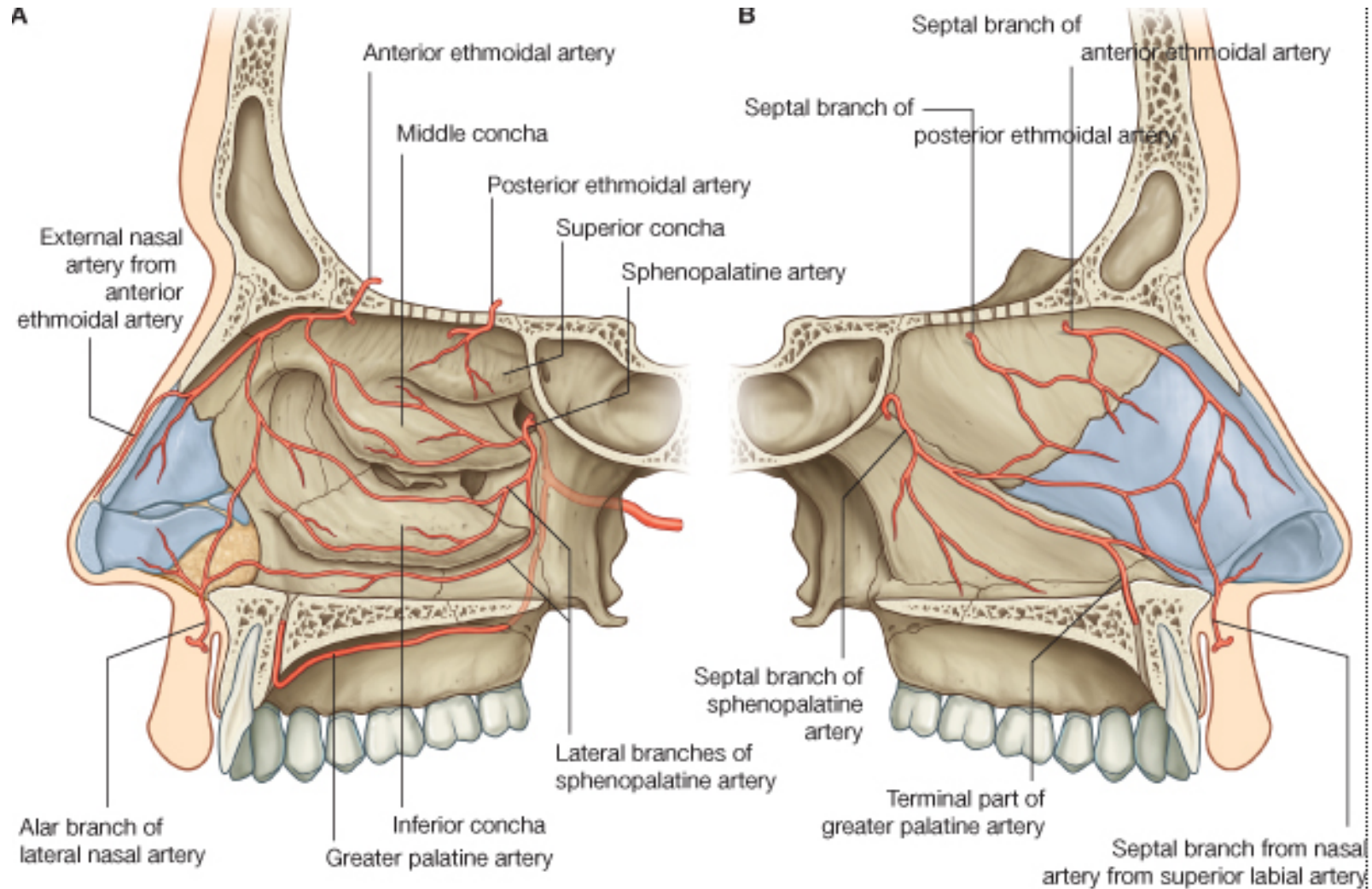


Gateways

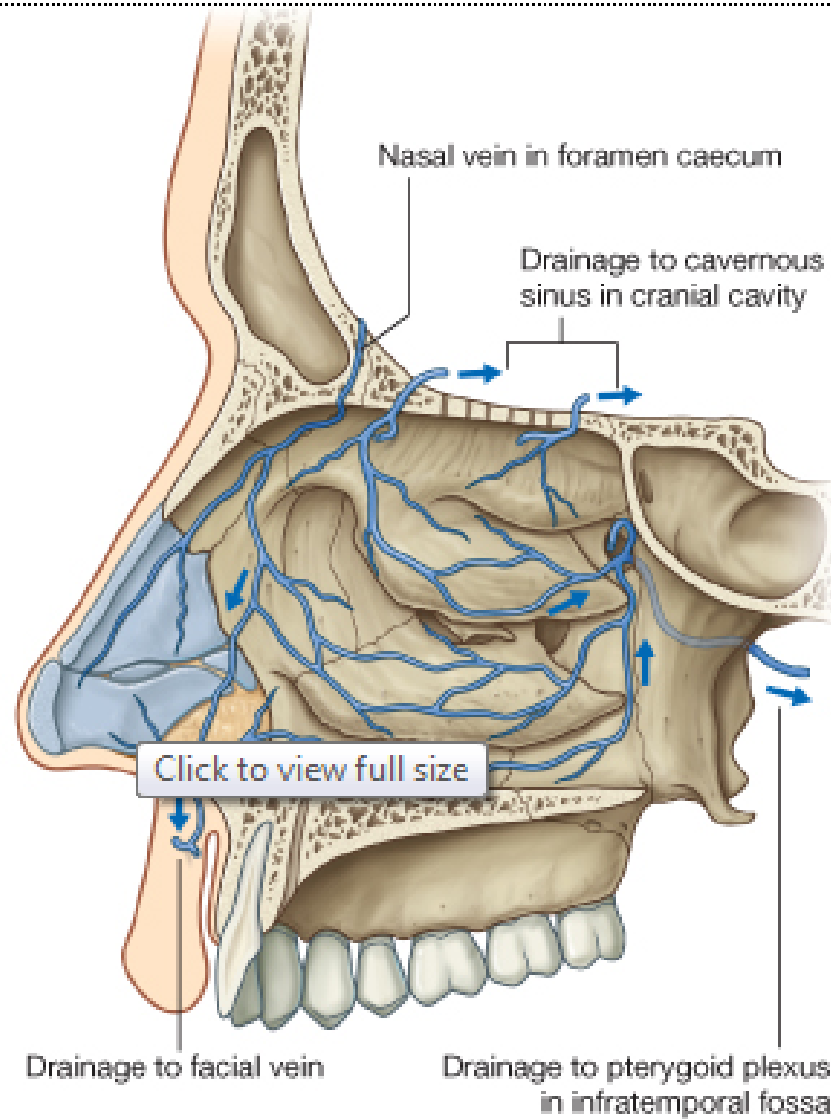
- Cribriform plate
- Sphenopalatine foramen
- Incisive canal
- Small foramina in the lateral wall



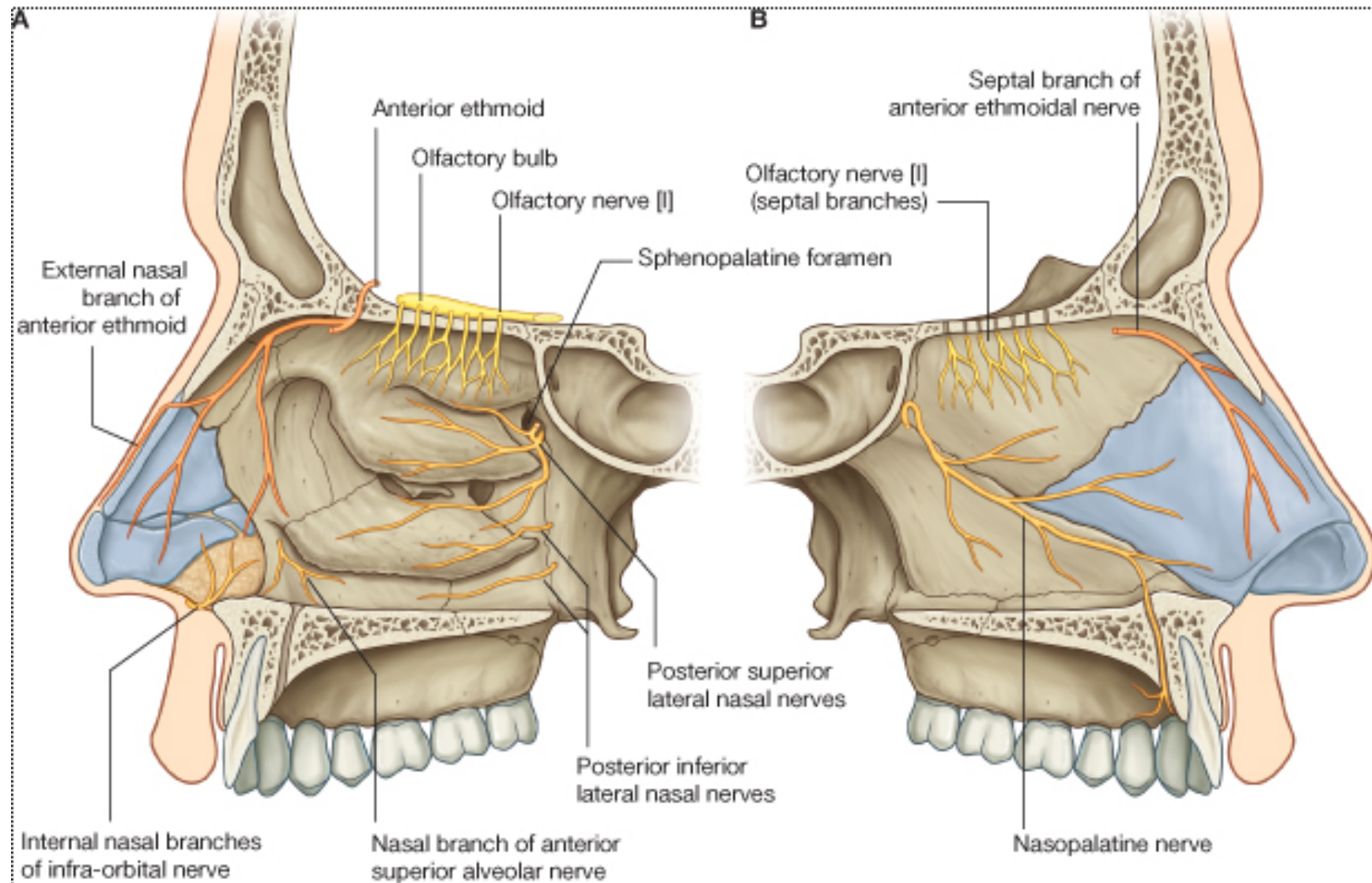
Arterial supply



Venous drainage



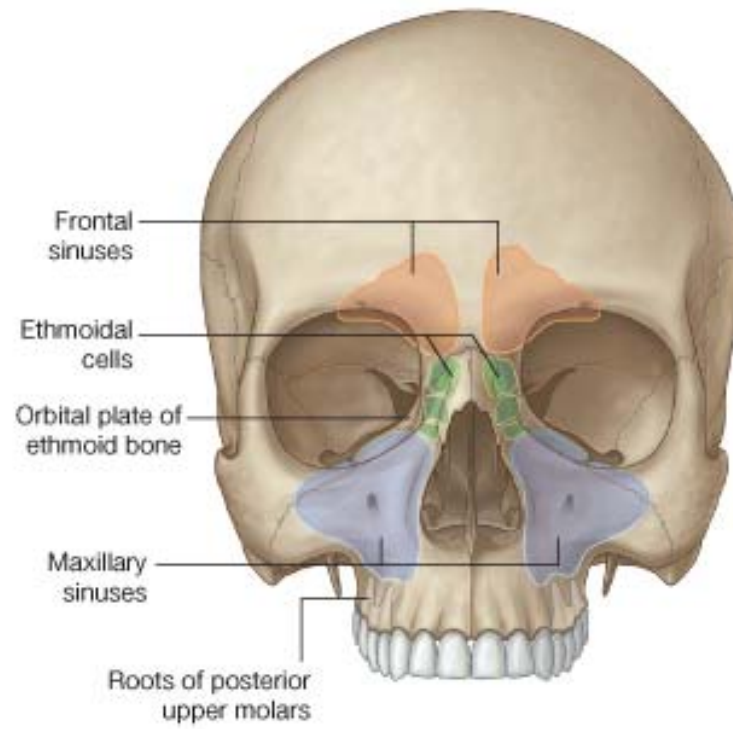
Nerve supply



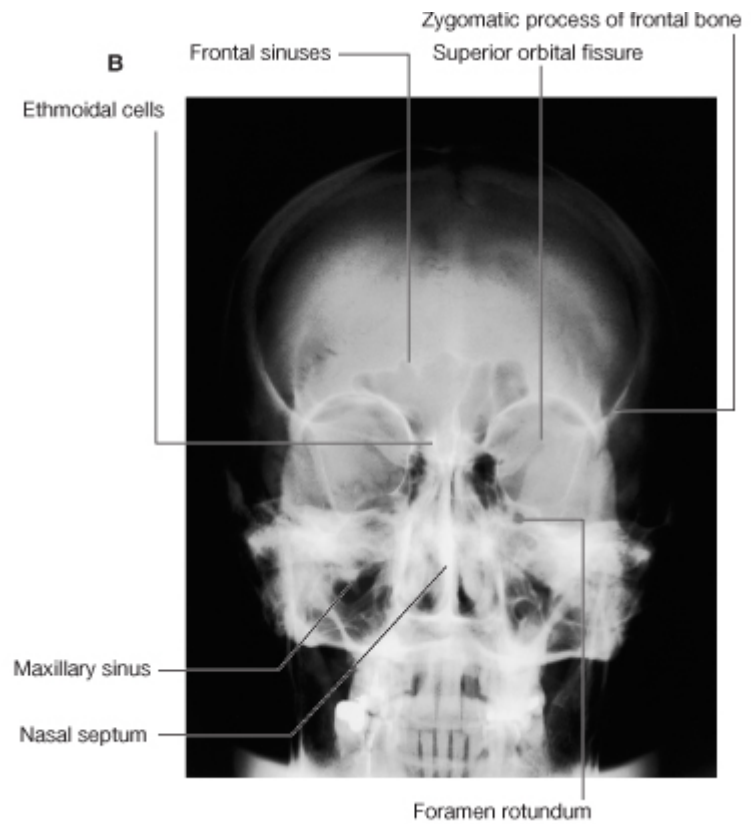
PARANASAL SINUSES

- The paranasal sinuses develop as outgrowths from the nasal cavities and erode into the surrounding bones.
- All are:
 - lined by respiratory mucosa, which is ciliated and mucus secreting;
 - open into the nasal cavities;
 - innervated by branches of the trigeminal nerve [V].
- bilateral paired — frontal
 - maxillary
 - ethmoidal (anterior, middle, posterior groups)
 - sphenoidal
- Sinuses absent or rudimentary at birth

A



B



FRONTAL SINUS

posterior to superciliary arches

Prominent in males

Rarely symmetrical

L=3.2cm, b=2.6 cm ,h=1.8 cm

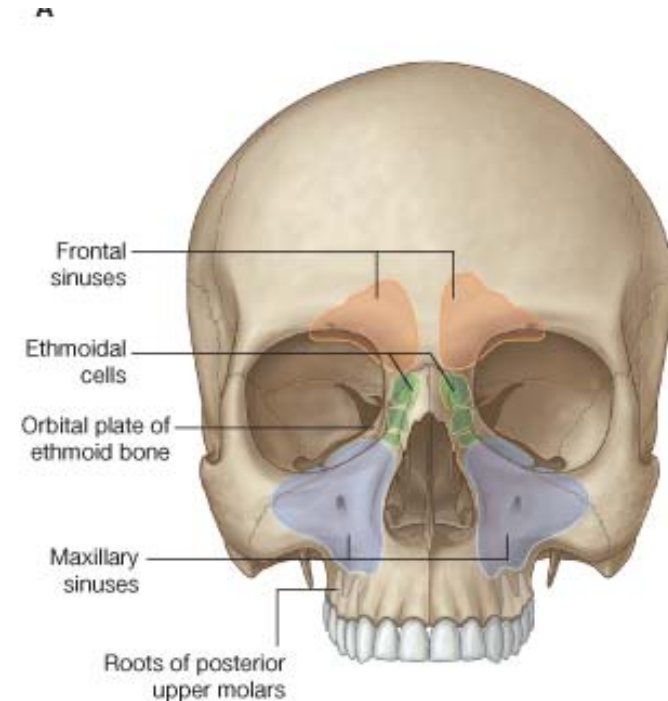
Incomplete septa- recesses

Opening- ethmoidal infundibulum
or frontonasal duct

Arterial supply: supraorbital,
anterior ethmoidal

Nerve supply: supraorbital

Lymphatic drainage: submandibular nodes



ETHMOIDAL SINUSES

Thin walled cavities in ethmoidal labyrinth

3 large to 18 small sinuses

Location- upper nasal cavity and orbit

Anterior group (infundibular) 11 , open at infundibulum

Middle group: (bullar sinuses) usually 3, open on / above ethmoidal bulla

Posterior group : 1-7 in no. open in superior meatus

Arterial supply: sphenopalatine, anterior, posterior ethmoidal art.

Lymphatic drainage: ant, middle group- submandibular nodes, post group- retropharyngeal nodes

Nerves: anterior, posterior ethmoidal nerves, orbital branches of pterygopalatine gang.

SPHENOIDAL SINUS

Paired, in body of sphenoid

Relations:

above to the cranial cavity, particularly to the pituitary gland and to the optic chiasma;

laterally, to the cranial cavity, particularly to the cavernous sinuses;

below and in front, to the nasal cavities.

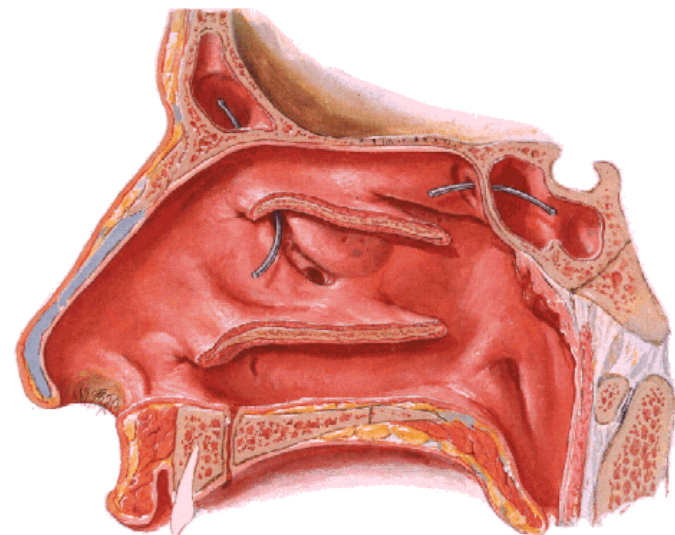
H=2 cm, b=1.8 cm, d=2.1cm

Opens at sphenoidal recess

Arterial supply: posterior ethmoidal art.

Lymphatic drainage: retropharyngeal nodes

Nerve supply: post. Ethmoidal nerves, orbital br



MAXILLARY SINUS

Paired, body of maxilla

Pyramidal- base, apex, roof, floor

Relations:

superolateral surface (roof) is related above to the orbit;

anterolateral surface is related below to the roots of the upper molar and premolar teeth and in front to the face;

posterior wall is related behind to the infratemporal fossa.

Conical elevations- roots molar teeth

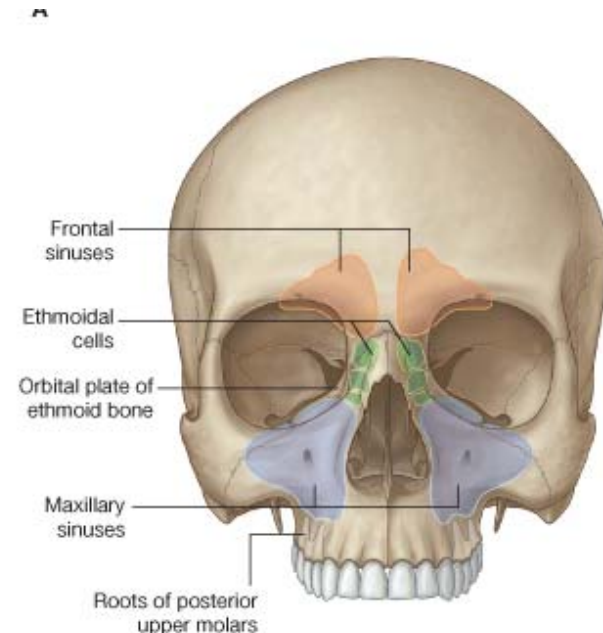
H=3.5cm, b=2.5cm, d=3.2cm

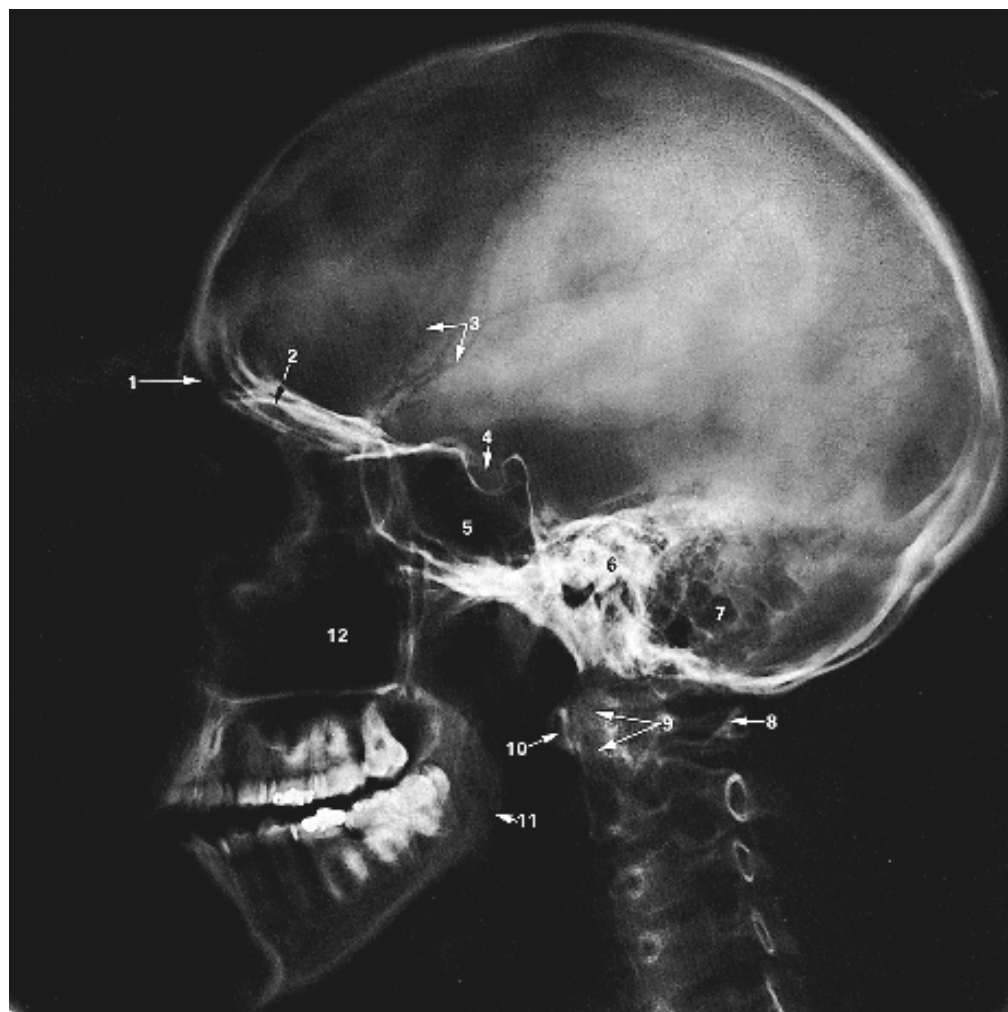
Opens hiatus semilunaris

Blood vessels: facial, greater palatine, infraorbital vessels

Lymphatic drainage: submandibular nodes

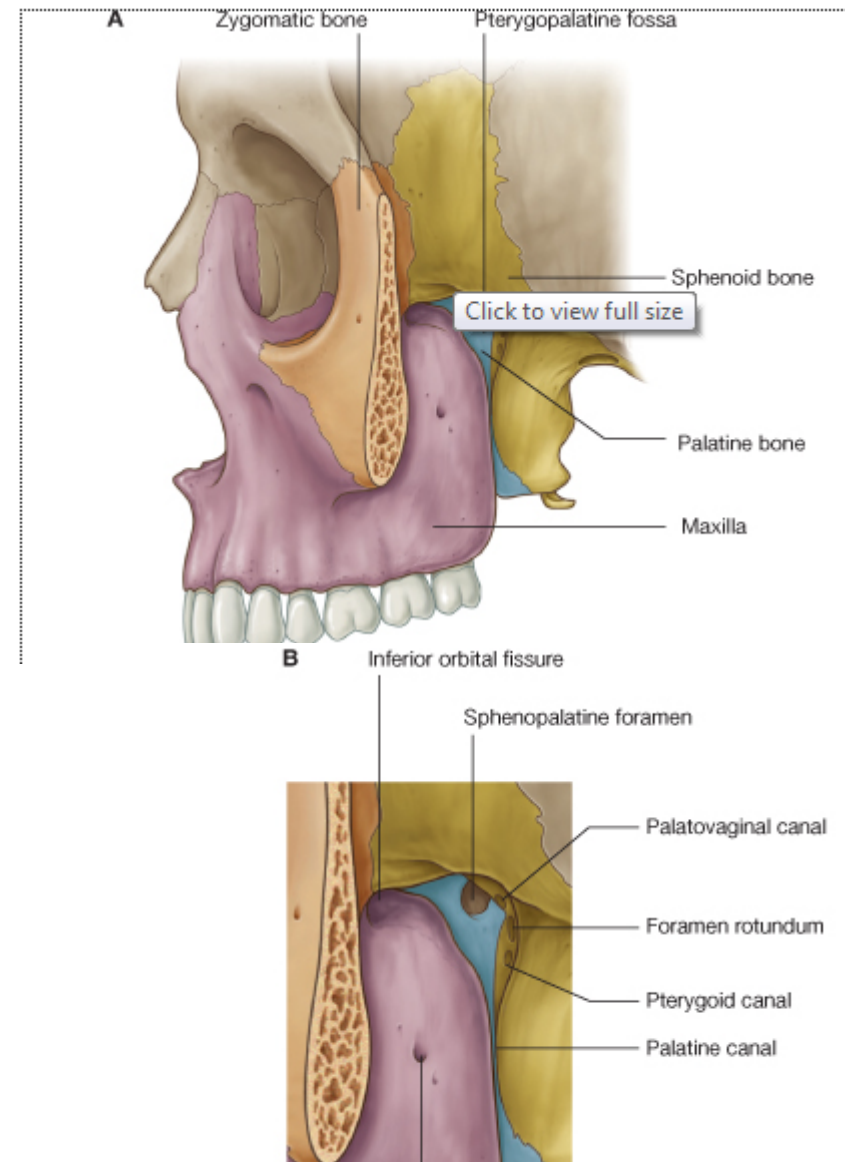
Nerve supply: infraorbital, ant., middle and post. Superior alveolar nerves





Pterygo-palatine fossa

- the middle cranial fossa;
- infratemporal fossa;
- floor of the orbit;
- lateral wall of the nasal cavity;
- oropharynx;
- roof of the oral cavity



Pterygo-palatine fossa

- the foramen rotundum and pterygoid canal communicate with the middle cranial fossa and open onto the posterior wall;
- a small **palatovaginal canal** opens onto the posterior wall and leads to the nasopharynx;
- the palatine canal leads to the roof of the oral cavity (hard palate) and opens inferiorly;
- the sphenopalatine foramen opens onto the lateral wall of the nasal cavity and is in the medial wall;
- the lateral aspect of the pterygopalatine fossa is continuous with the infratemporal fossa via a large gap (the **pterygomaxillary fissure**) between the posterior surface of the maxilla and pterygoid process of the sphenoid bone;
- the superior aspect of the anterior wall of the fossa opens into the floor of the orbit via the inferior orbital fissure

Pterygopalatine ganglion

Peripheral parasymp. Ganglion

Sensory

Parasympathetic

Sympathetic

Branches:

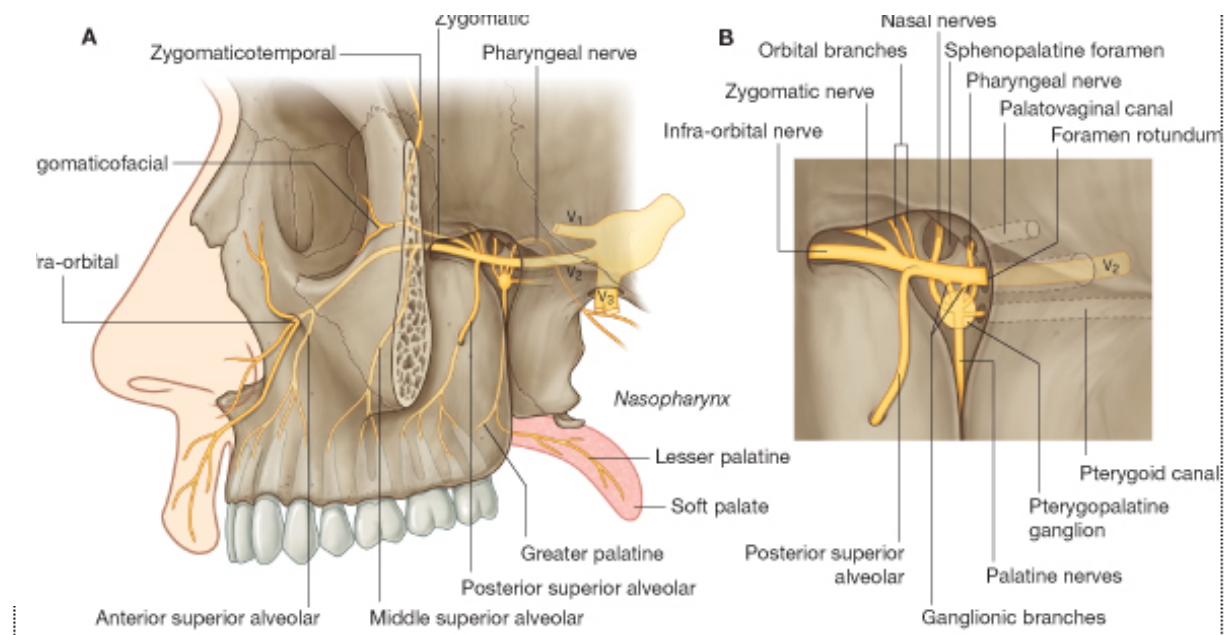
Orbital

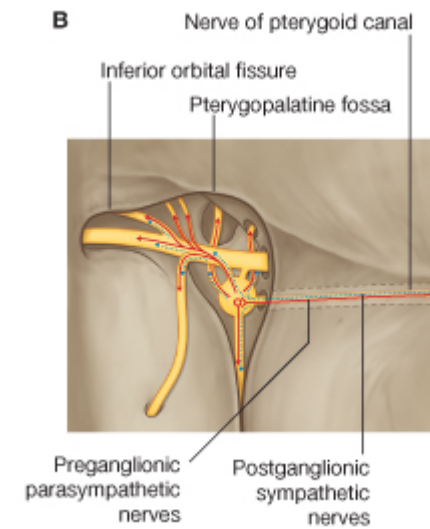
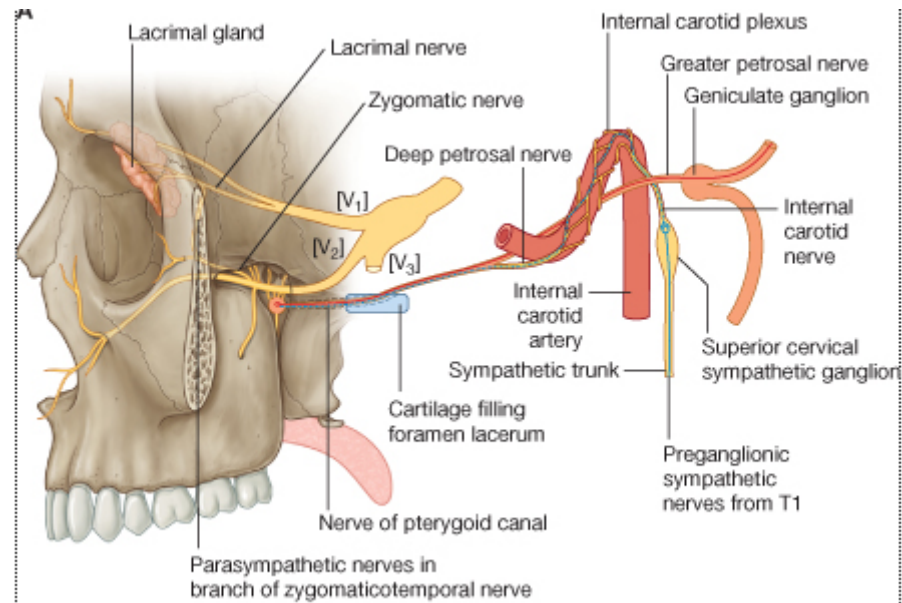
Greater and lesser palatine
nerves

Pharyngeal

Nasal

Zygomatic





Applied Anatomy

- Nasal fractures
- Deviation of the nasal septum
- Rhinitis
- Epistaxis
- Sinusitis: Frontal

Ethmoidal air cells

Maxillary

sphenoidal

Transillumination of sinuses

- *Because only thin shelves of bone separate the sphenoidal sinuses from the nasal cavities below and hypophyseal fossa above, the pituitary gland can be surgically approached through the roof of the nasal cavities by passing first through the anteroinferior aspect of the sphenoid bone and into the sphenoidal sinuses and then through the top of the sphenoid bone into the hypophyseal fossa.*