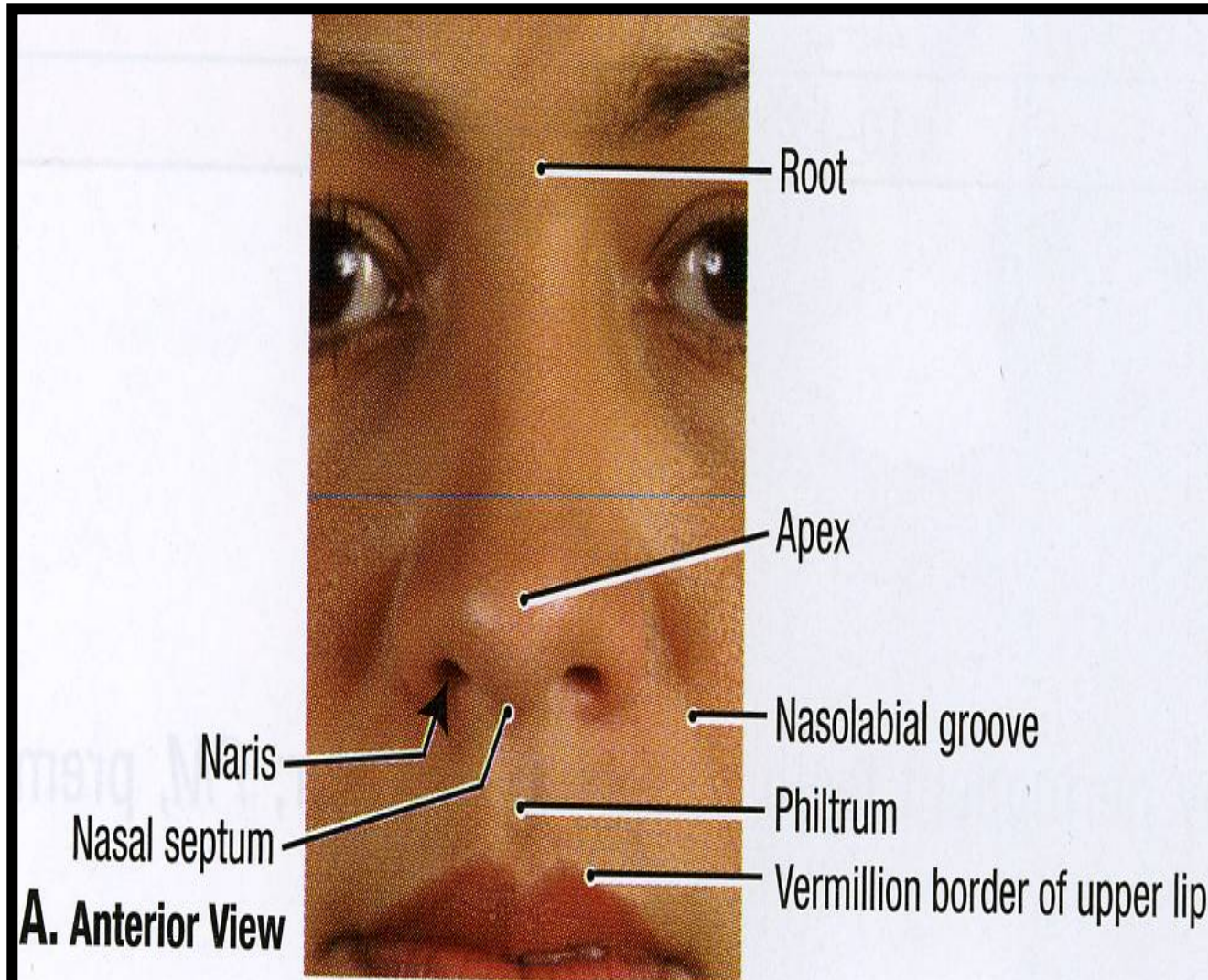


ANATOMY OF THE NOSE AND OLFACTORY NERVE

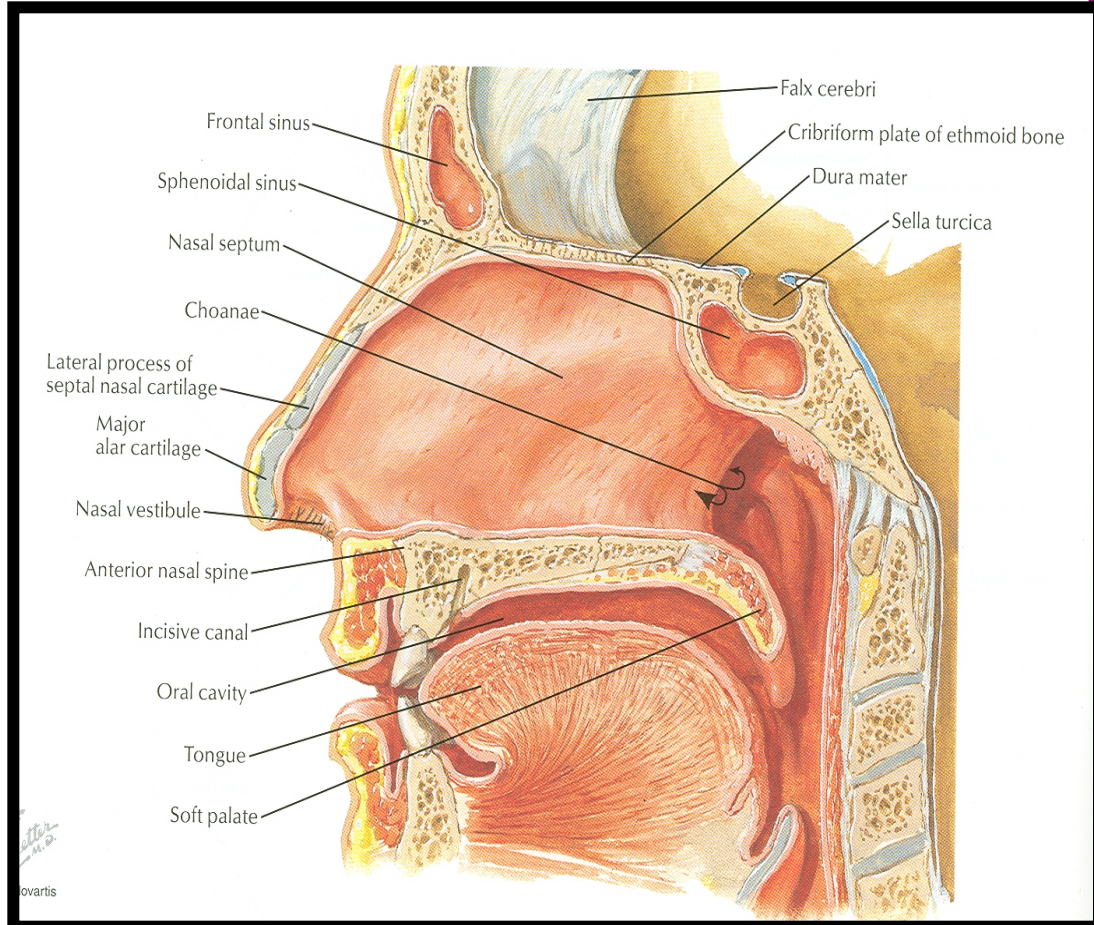


OBJECTIVES

- By the end of this lecture the students should be able to:
- Describe the structures forming the walls of the nasal cavity.
- List the main structures draining into the lateral wall of the nasal cavity.
- Differentiate between the respiratory and olfactory regions of the nasal cavity.
- List the main sensory and blood supply of the nose.
- Describe the olfactory pathway.

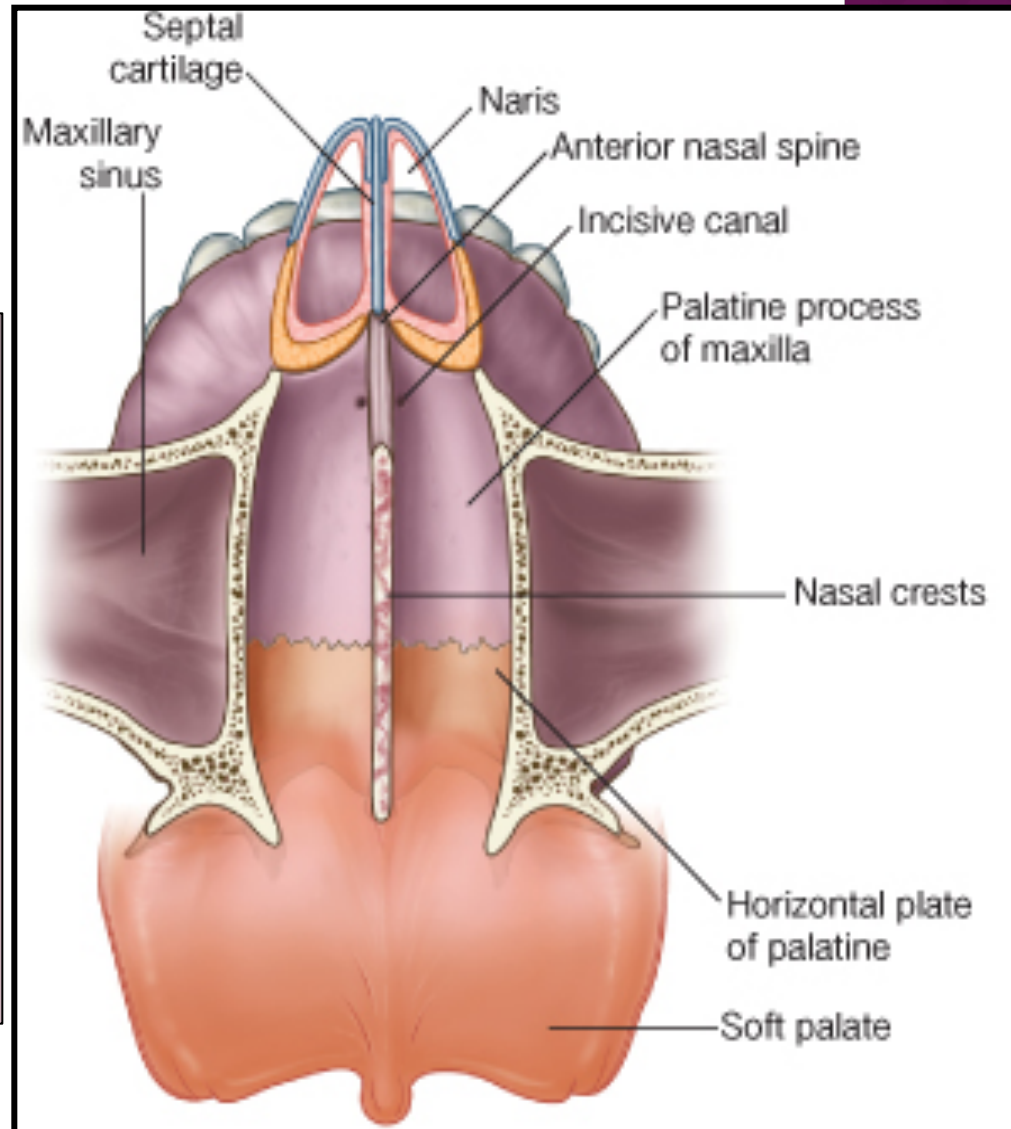
NASAL CAVITY

- It extends from nostrils anteriorly to the choanae posteriorly.
- Divided into right and left parts by the nasal septum.
- Each part has:
 - Roof
 - Floor
 - Lateral and
 - Medial walls.



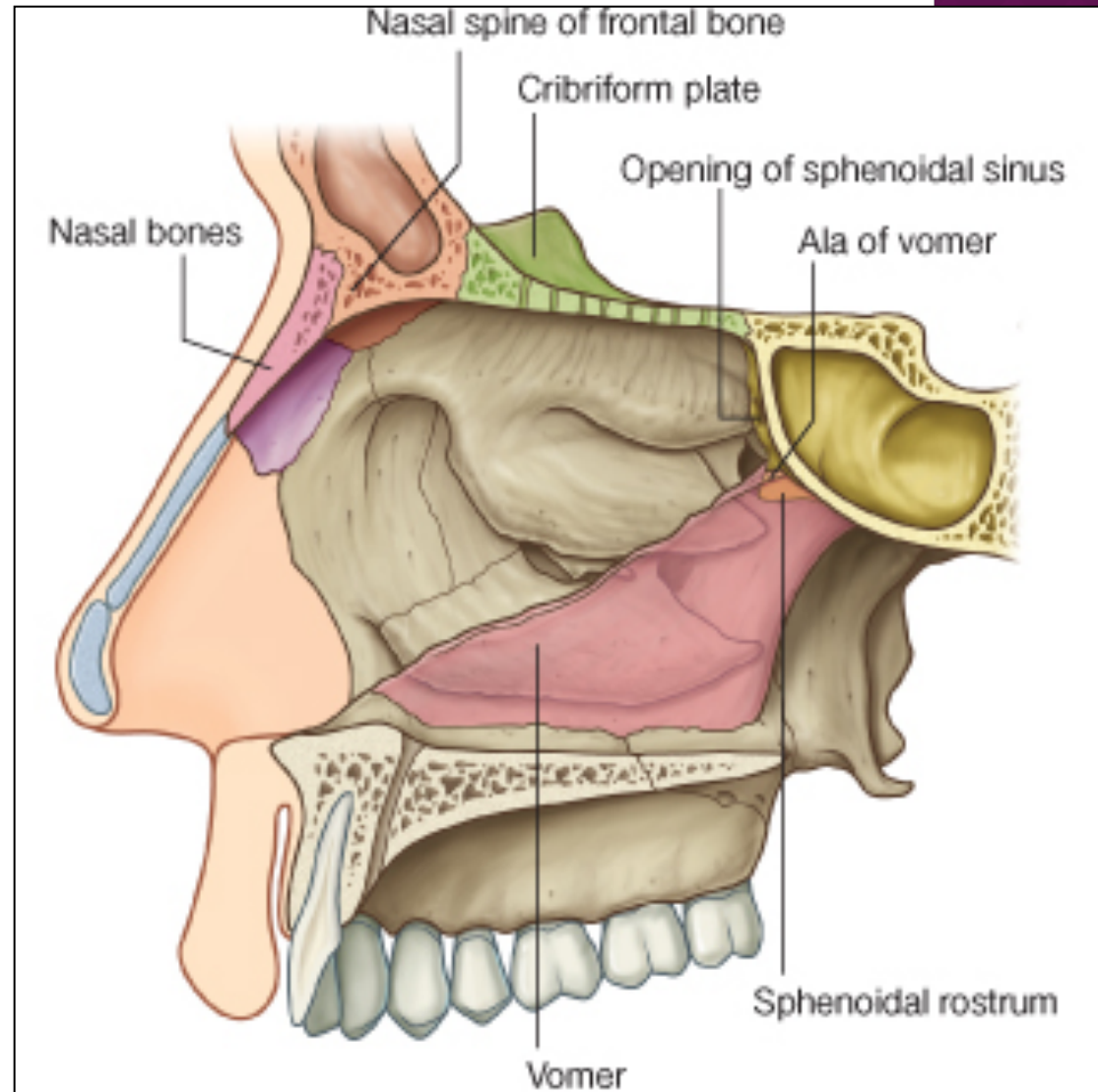
FLOOR

- Formed by:
- Nasal (upper) surface of the hard (bony) palate:
- Palatine process of maxilla, **anteriorly**.
- Horizontal plate of the palatine bone, **posteriorly**.



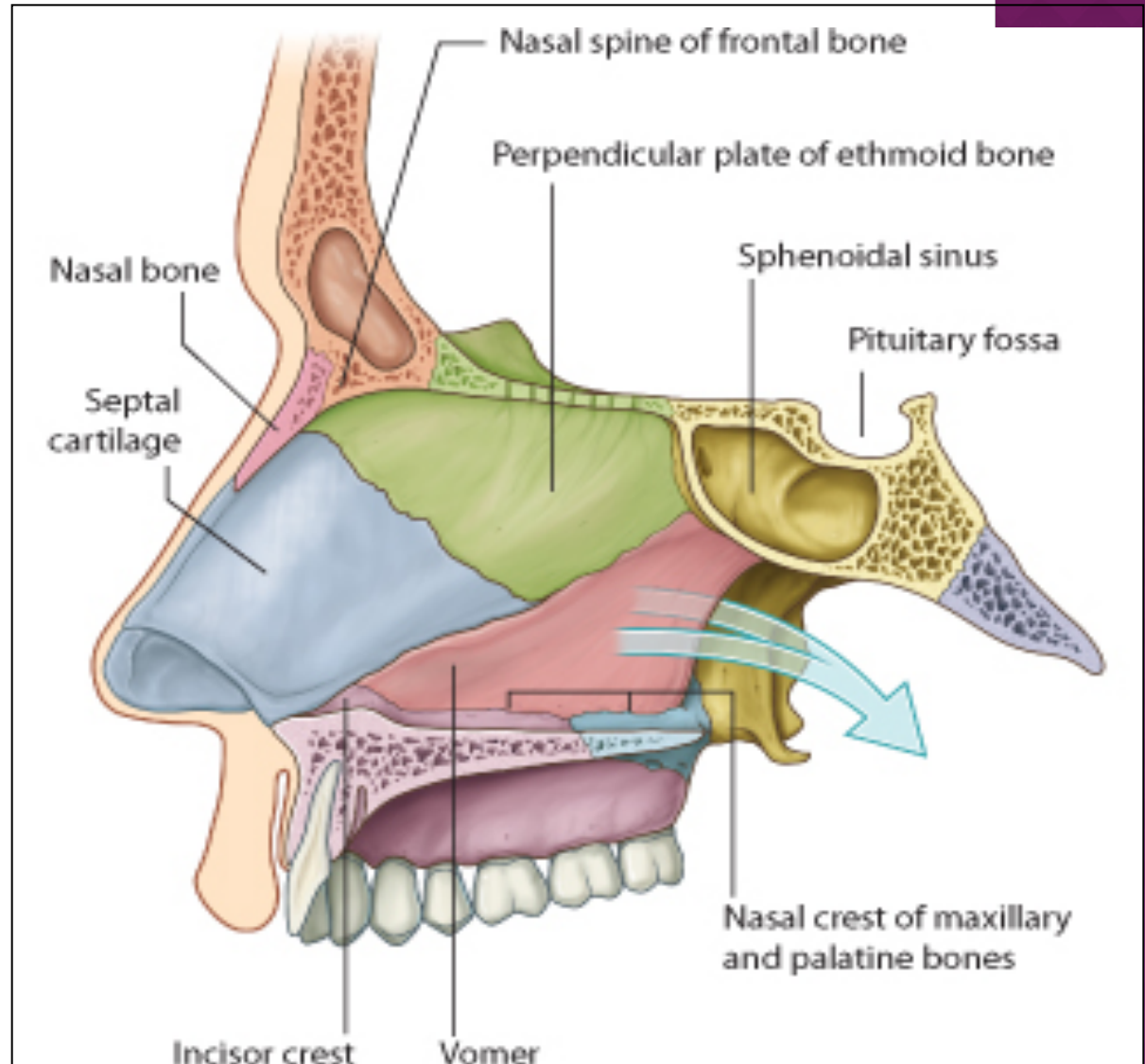
ROOF

- ◉ **Formed by:**
- ◉ Body of sphenoid, **posteriorly.**
- ◉ Cribriform plate of ethmoid, in the **middle.**
- ◉ Frontal, and nasal bones, **Anteriorly.**



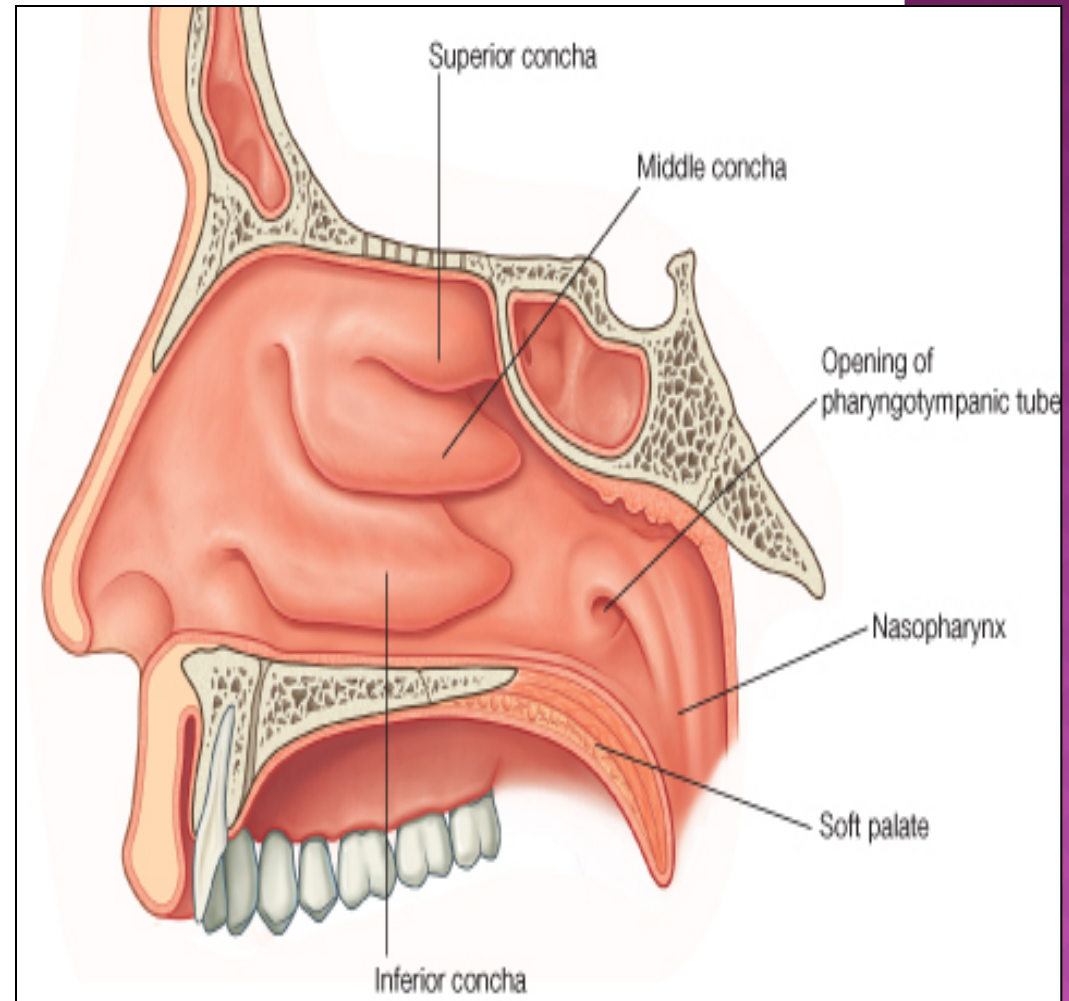
MEDIAL WALL

- The nasal septum :
- Vertical plate of ethmoid.
- Septal cartilage.
- Vomer.

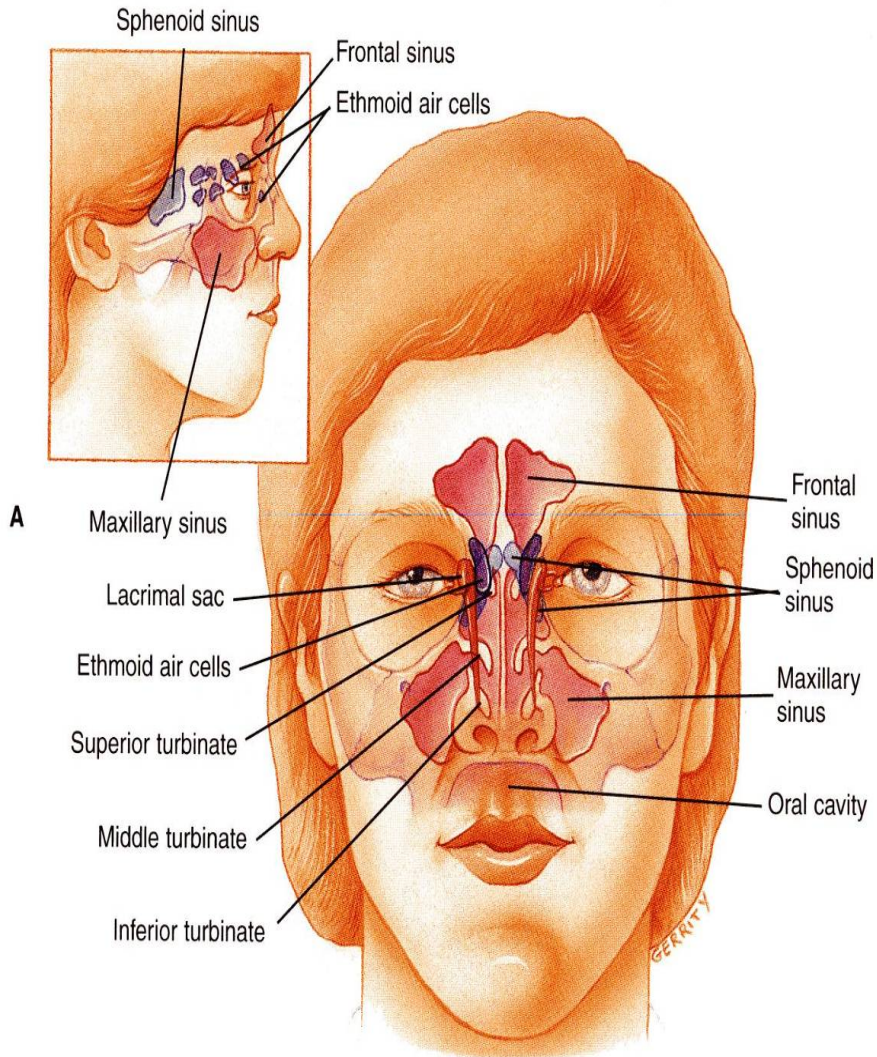


- ◉ Marked by:
- ◉ Three projections (Nasal Conchae):
- ◉ **Superior, middle, and inferior**
- ◉ The space below each concha is called **Meatus.**
- ◉ **Superior, middle, and inferior meatus.**
- ◉ The space (fossa) above the superior concha is the **Sphenoethmoidal recess.**

LATERAL WALL



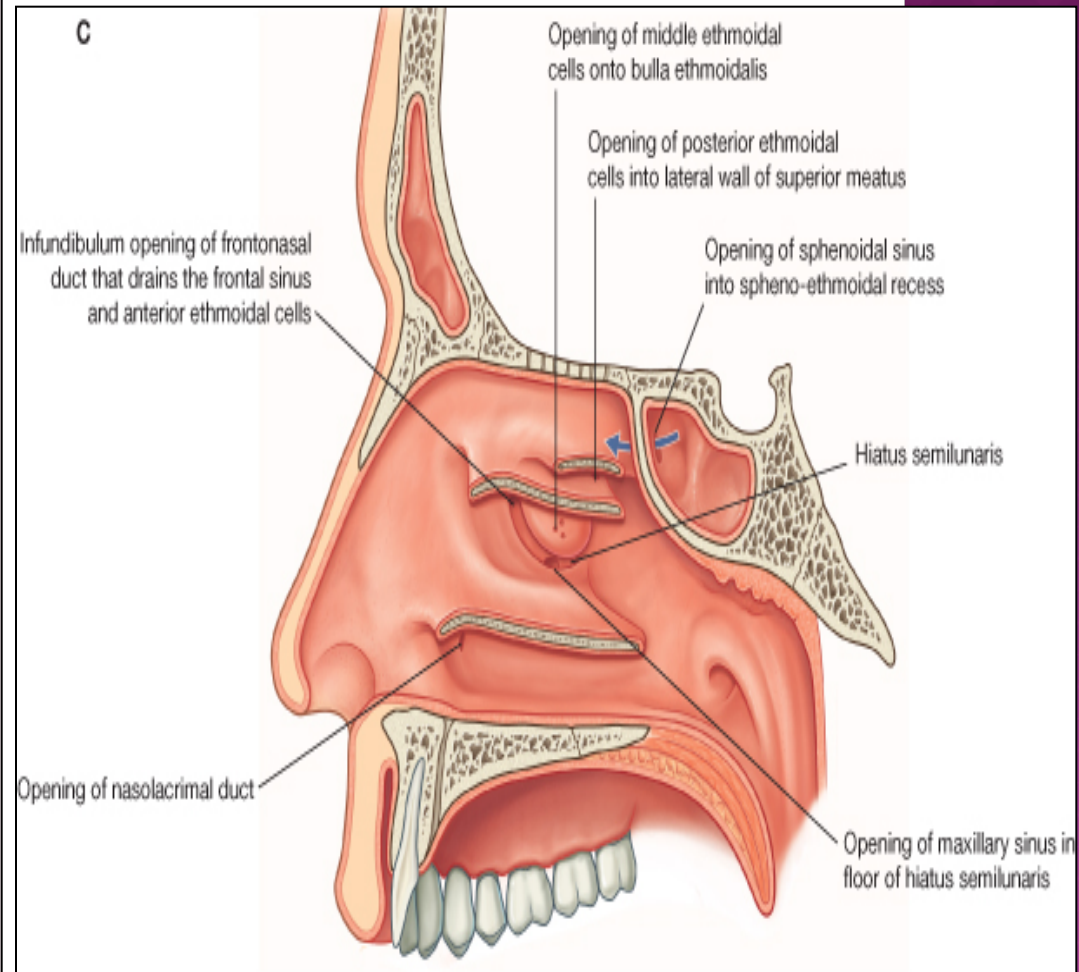
PARANASAL SINUSES

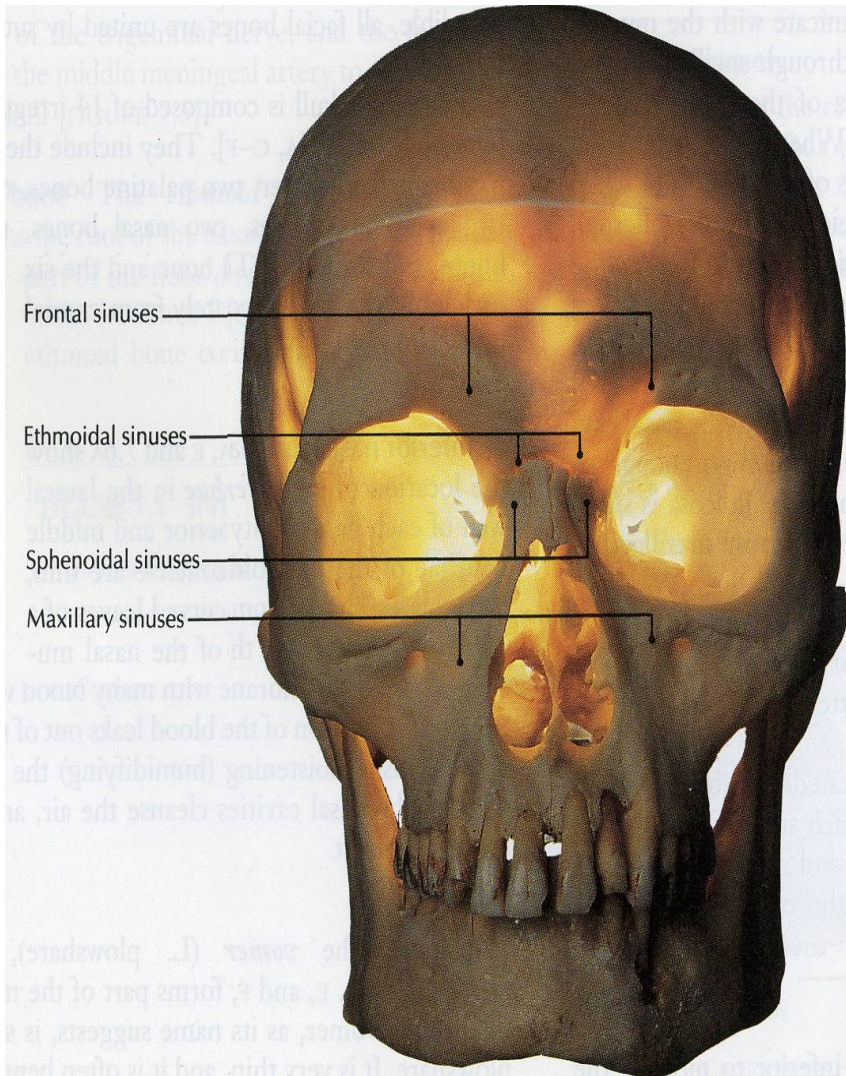


- ❖ They are **cavities** inside the:
 - ❖ Maxilla
 - ❖ Frontal bone
 - ❖ Sphenoid bone
 - ❖ Ethmoid bone
- ❖ They are:
 - ❖ **Lined** with mucoperiosteum;
 - ❖ **Filled** with air; &
 - ❖ **Communicate** with the nasal cavity.
 - ❖ Open in the lateral wall of the nasal cavity
 - ❖ **Function:**
 - Lighten the skull weight
 - Amplify the sound as we speak.

SINUSES OPENING IN LATERAL WALL

- Sphenoethmoidal recess receives the opening of **sphenoidal air sinus**
- Superior meatus; receives the opening of **posterior ethmoidal sinus**.
- Middle meatus; contains **bullae ethmoidalis** and hiatus semilunaris,
- Receives the openings of **maxillary, frontal, & anterior, middle ethmoidal sinuses**.
- Inferior meatus; receives the opening of **nasolacrimal duct**.





The mucosal lining of these sinuses is continuous with that in the nose and the throat. So infection in this area tends to migrate into the sinuses causing sinusitis.

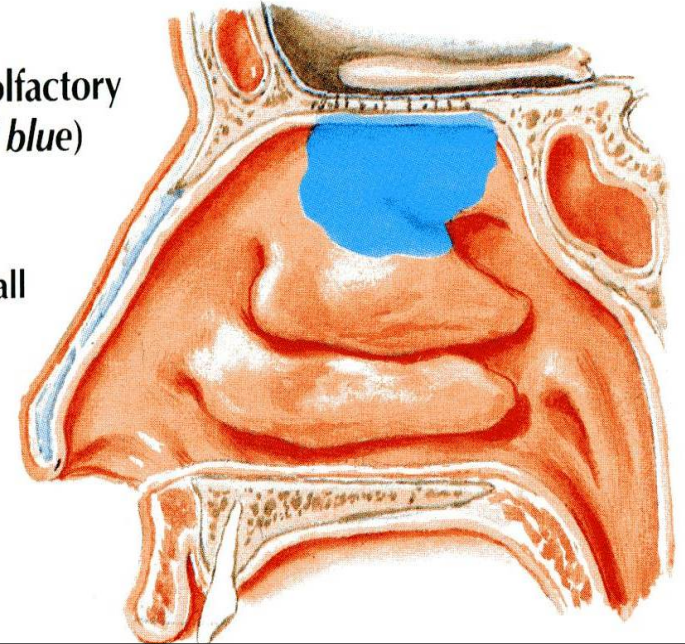
- ◉ **Note** : all sinuses open into the middle meatus **EXCEPT:**
- ◉ **Sphenoidal sinus** : in sphenoidal recess.
- ◉ **Posterior ethmoidal sinus** : in superior meatus.

NASAL MUCOSA

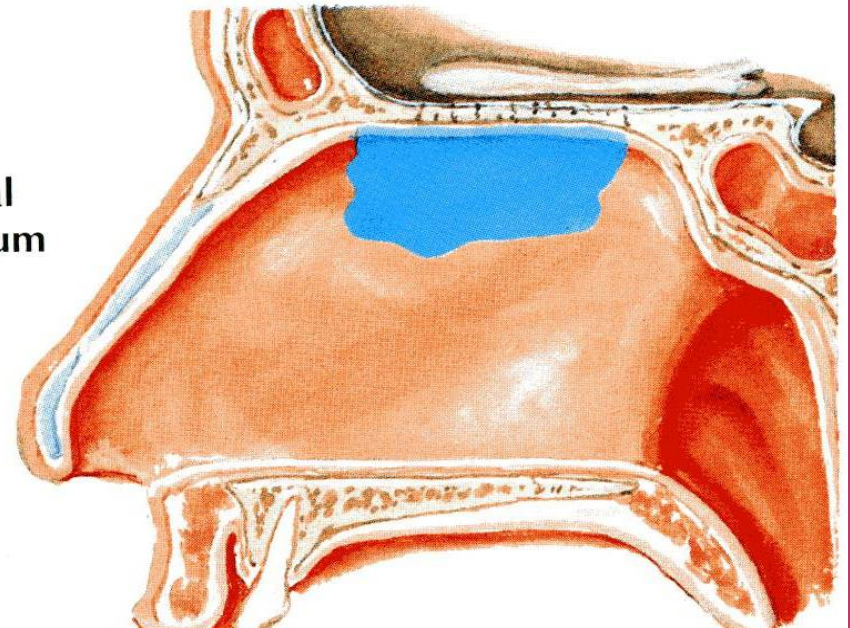
- Olfactory :
- It is delicate and contains olfactory nerve cells.
- It is present in the upper part of nasal cavity:
- Roof
- On the lateral wall, it lines the upper surface of the superior concha and the sphenoethmoidal recess.
- On the medial wall, it lines the superior part of the nasal septum.

Distribution of olfactory mucosa (*shaded blue*)

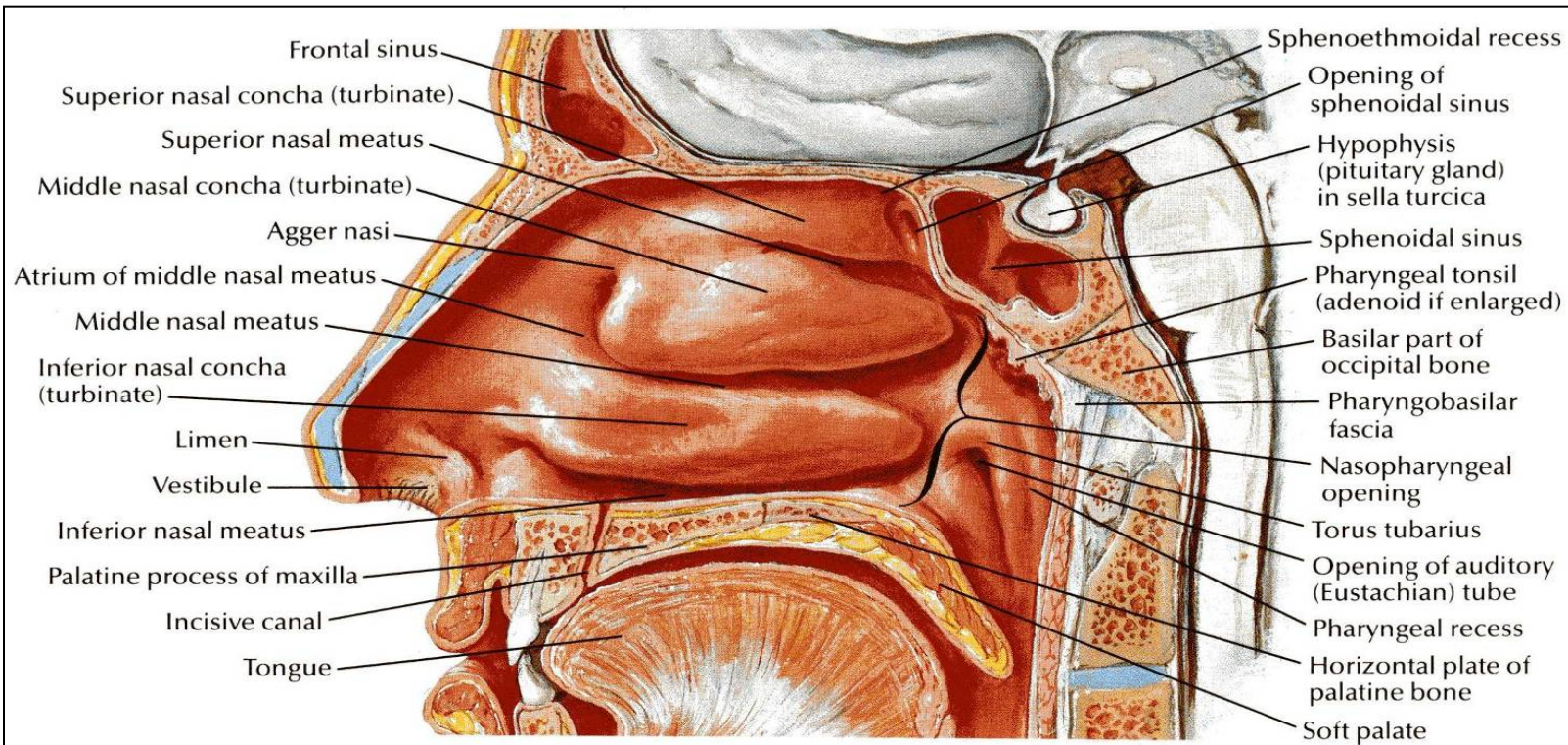
Lateral nasal wall



Nasal septum



RESPIRATORY MUCOSA



- It is **thick**, ciliated, highly vascular and contains mucous glands & goblet cells
- It lines the **lower part** of the nasal cavity (from **skin of vestibule** to the superior concha).
- It functions to **moisten**, **clean** and **warm** the inspired air.
- The air is **moistened** by the secretion of numerous serous glands.
- It is **cleaned** by the removal of the dust particles by the ciliary action of the columnar ciliated epithelium that covers the mucosa.
- The air is **warmed** by a *submucous venous plexus*.

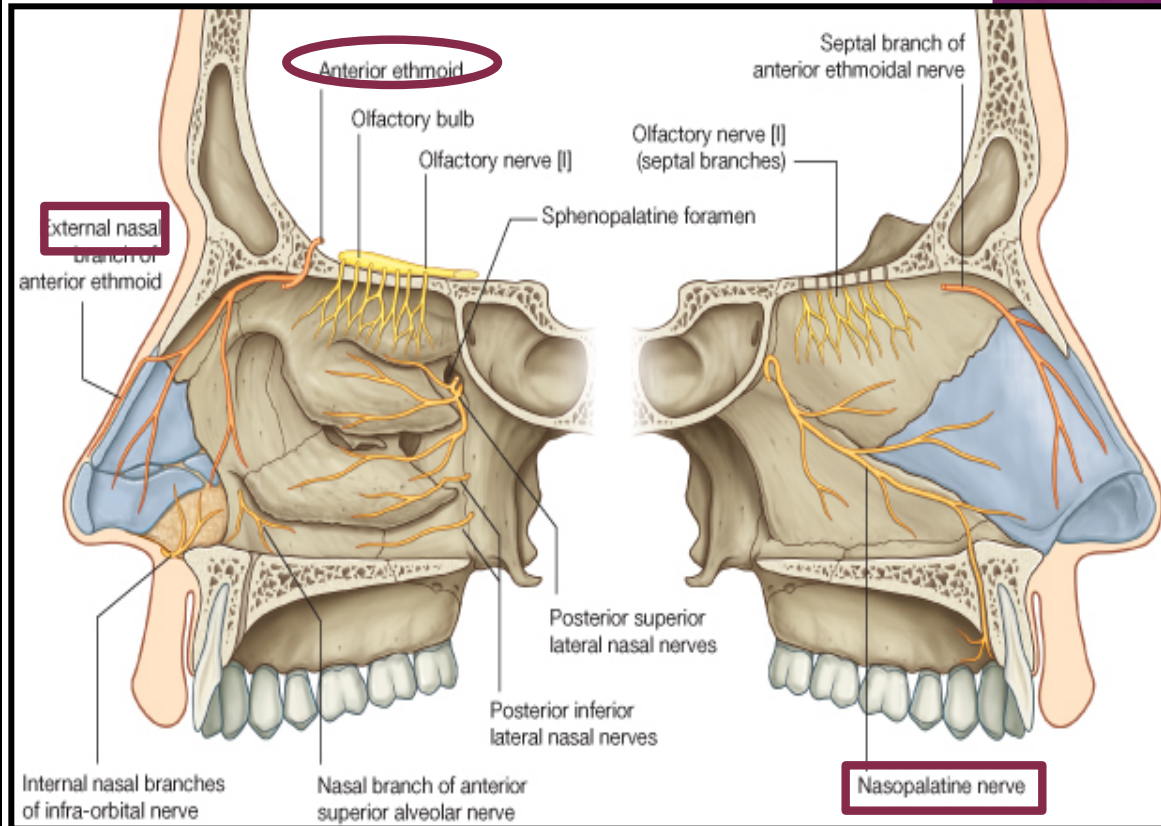
- The nerves of General Sensation are derived from the **Ophthalmic & Maxillary** divisions of *trigeminal nerve*.

- The *anterior part is supplied by:*
Anterior Ethmoidal nerve.

- The *posterior part is supplied by branches* of the **pterygopalatine ganglion:**

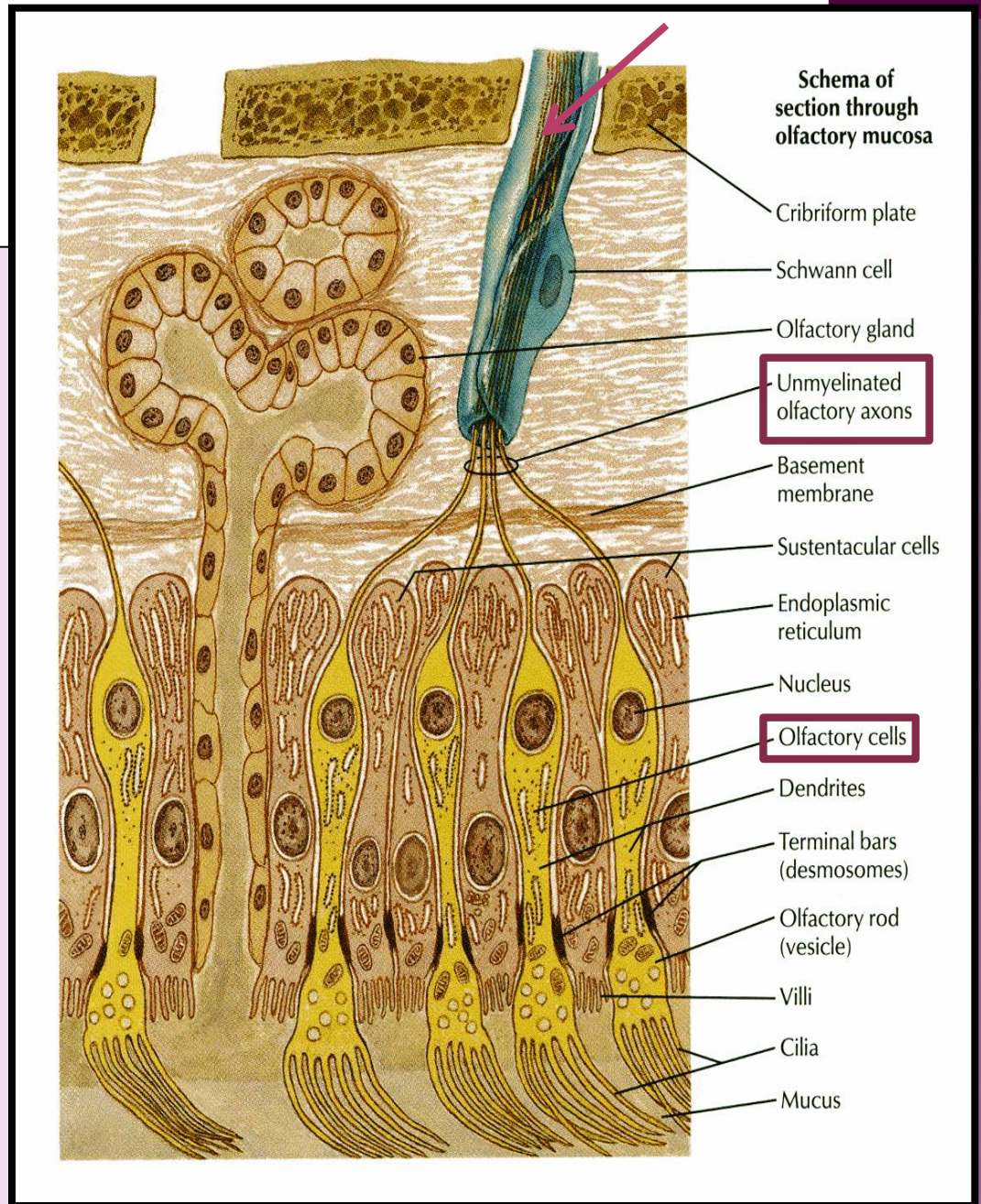
- 1- *Nasopalatine,*
- 2- *Nasal, and*
- 3- *Palatine*

NERVE SUPPLY

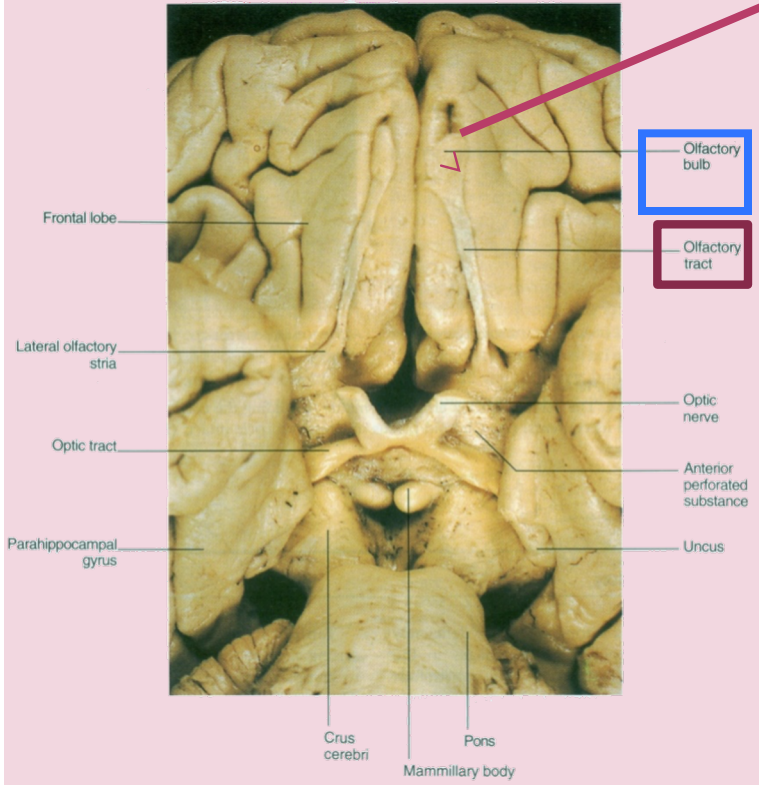
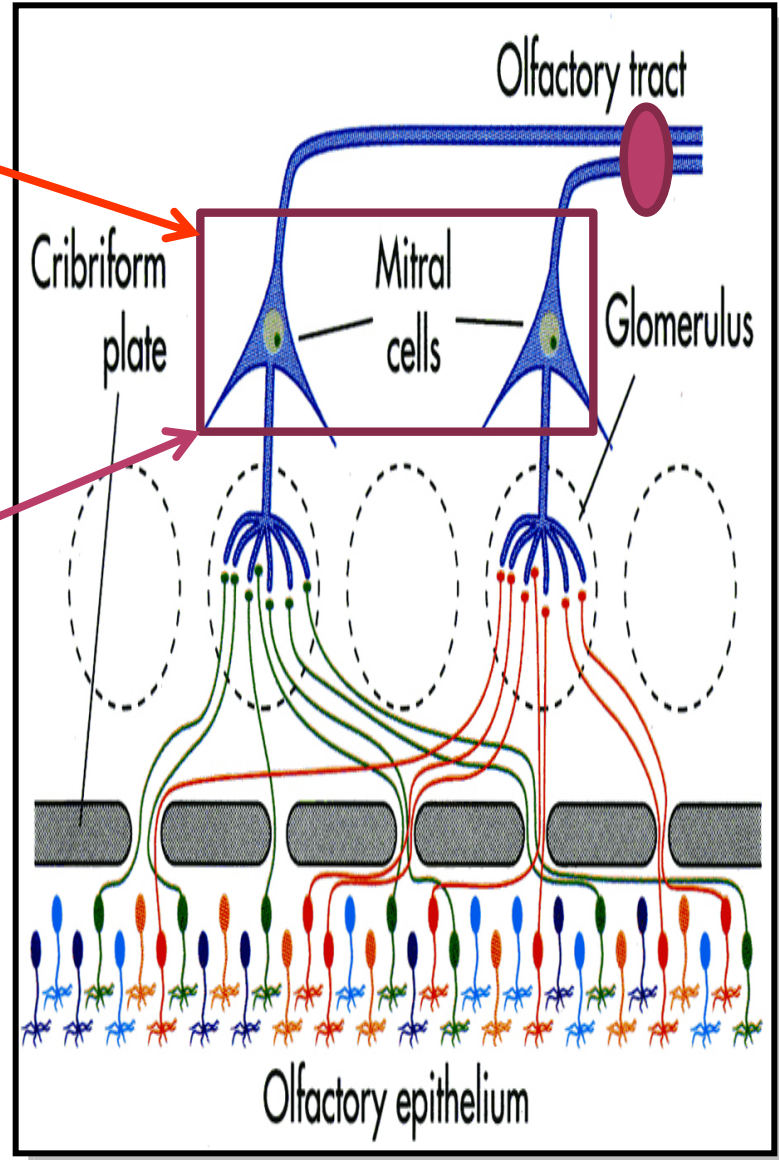


SPECIAL SENSATION OLFACTORY NERVE

- Olfactory pathway:
- 1st neurone:
- Olfactory receptors are specialized, *ciliated nerve cells* that lie in the olfactory epithelium.
- The axons of these bipolar cells 12-20 fibers form the true olfactory nerve fibers.
- Which passes through the cribriform plate of ethmoid.
- They join the **olfactory bulb**



Preliminary processing of olfactory information is within the **olfactory bulb**, which contains interneurons and large **Mitral cells**; axons from the latter leave the bulb to form the **olfactory tract**.



- 2nd neurone:

- It is formed by the **Mitral cells of olfactory bulb.**

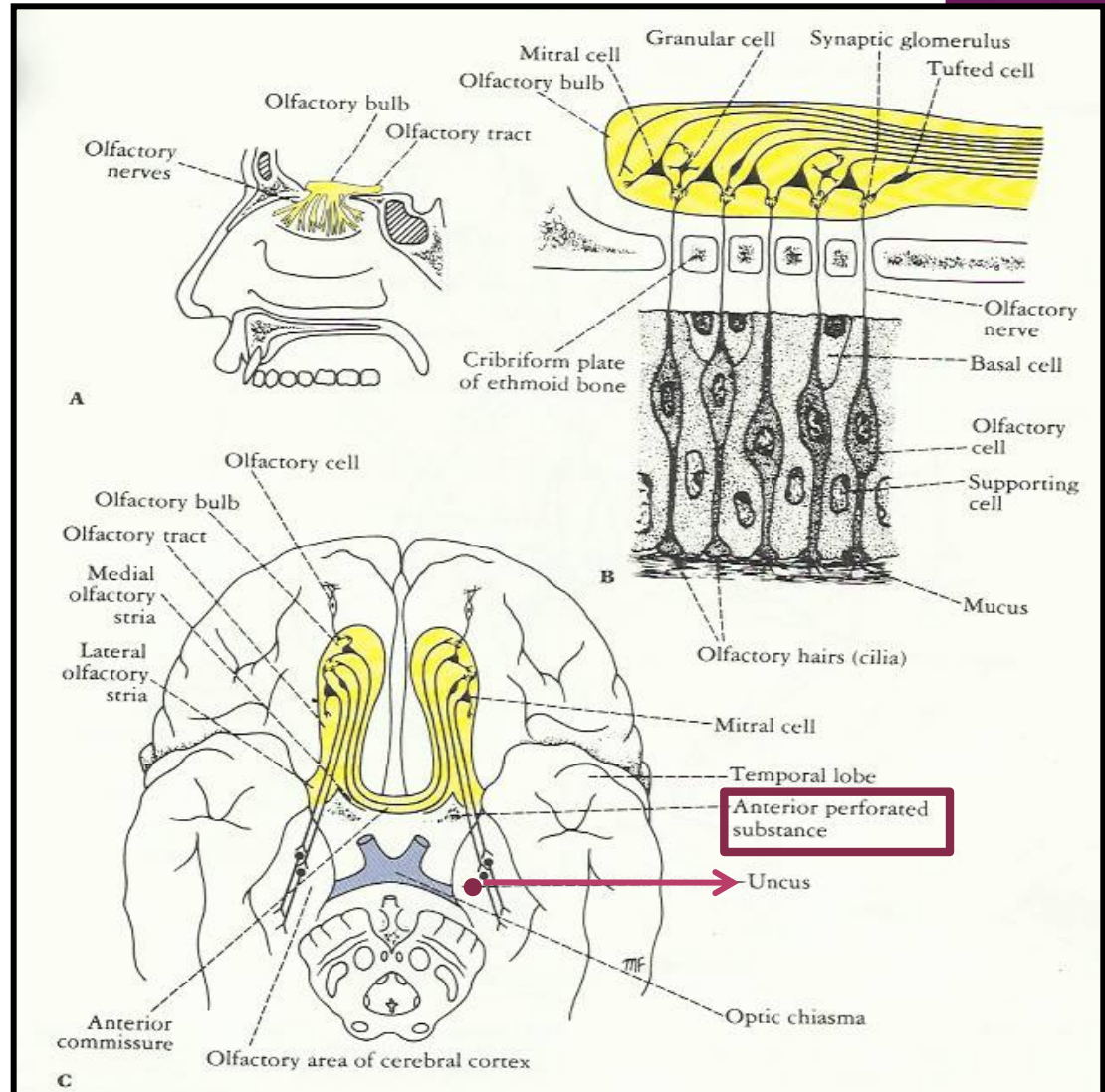
- The axons of these cells form the olfactory tract.

- Each tract divides into 2 roots at the anterior perforated substance:

- Lateral root:

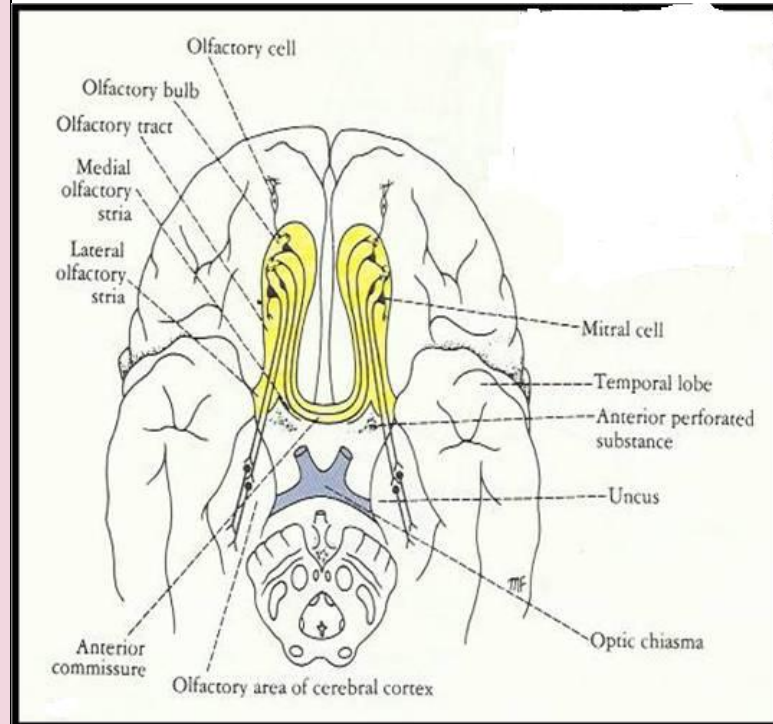
- Carries olfactory fibers to end in cortex of the **Uncus** & adjacent part of **Hippocampal gyrus (center of smell).**

OLFACTORY PATHWAY



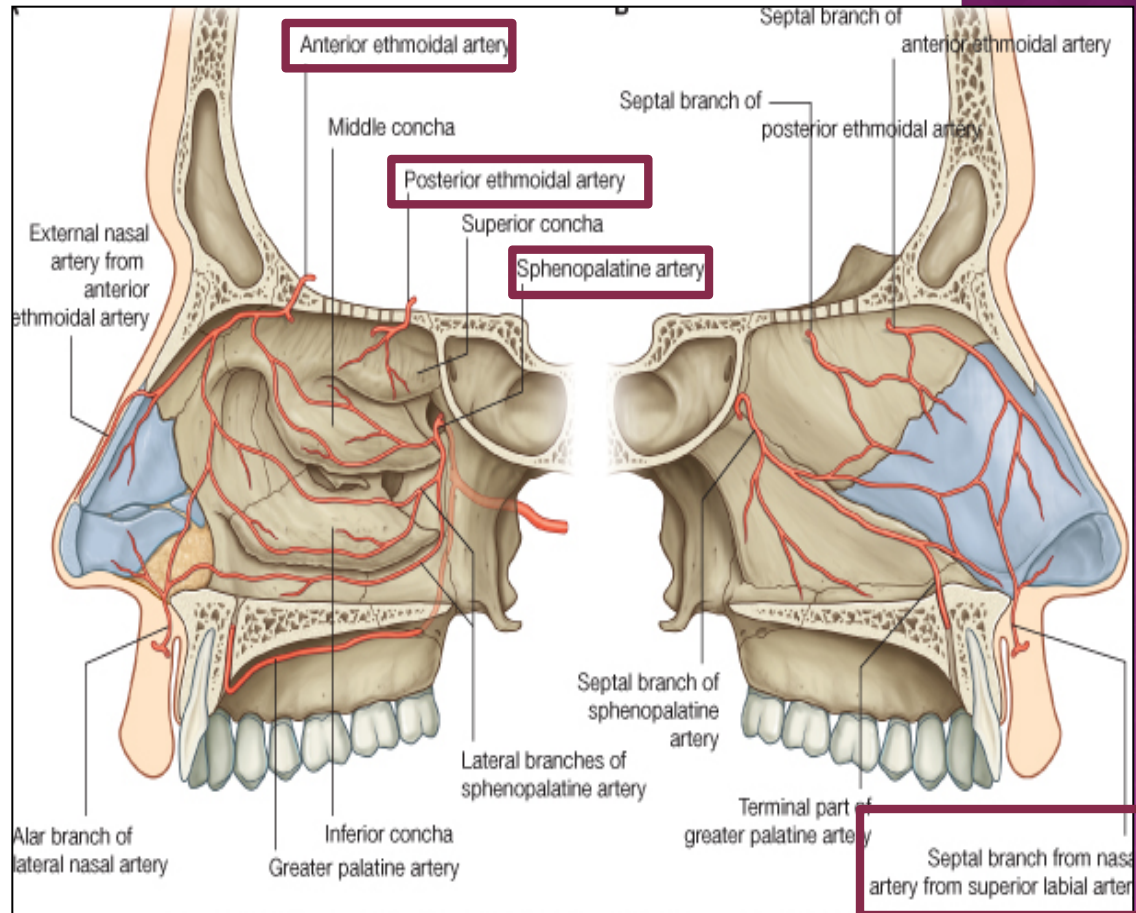
○ Medial root :

- crosses midline through **anterior commissure** and joins the uncrossed lateral root of opposite side.
- It connects olfactory centers of 2 cerebral hemispheres.
- So each olfactory centre receives smell sensation from both halves of nasal cavity.
- **NB. Olfactory pathway is the only sensory pathway which reaches the cerebral cortex without passing through the **Thalamus**.**

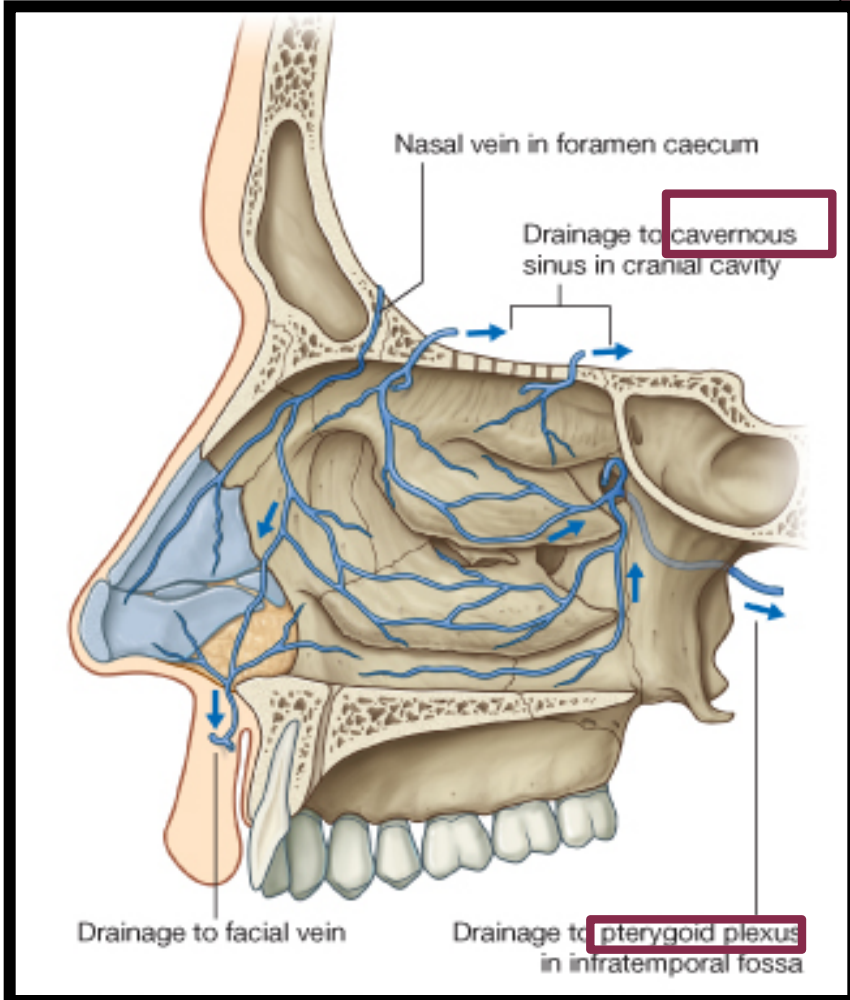


ARTERIAL SUPPLY

- ◉ Sphenopalatine artery (maxillary) .
- ◉ Anterior and Posterior Ethmoidal (ophthalmic).
- ◉ Superior labial (facial).
- ◉ Applied anatomy :
- ◉ The most common site for epistaxis is at the anterior & inferior part of nasal septum (Little's area) because of the rich arterial anastomosis .



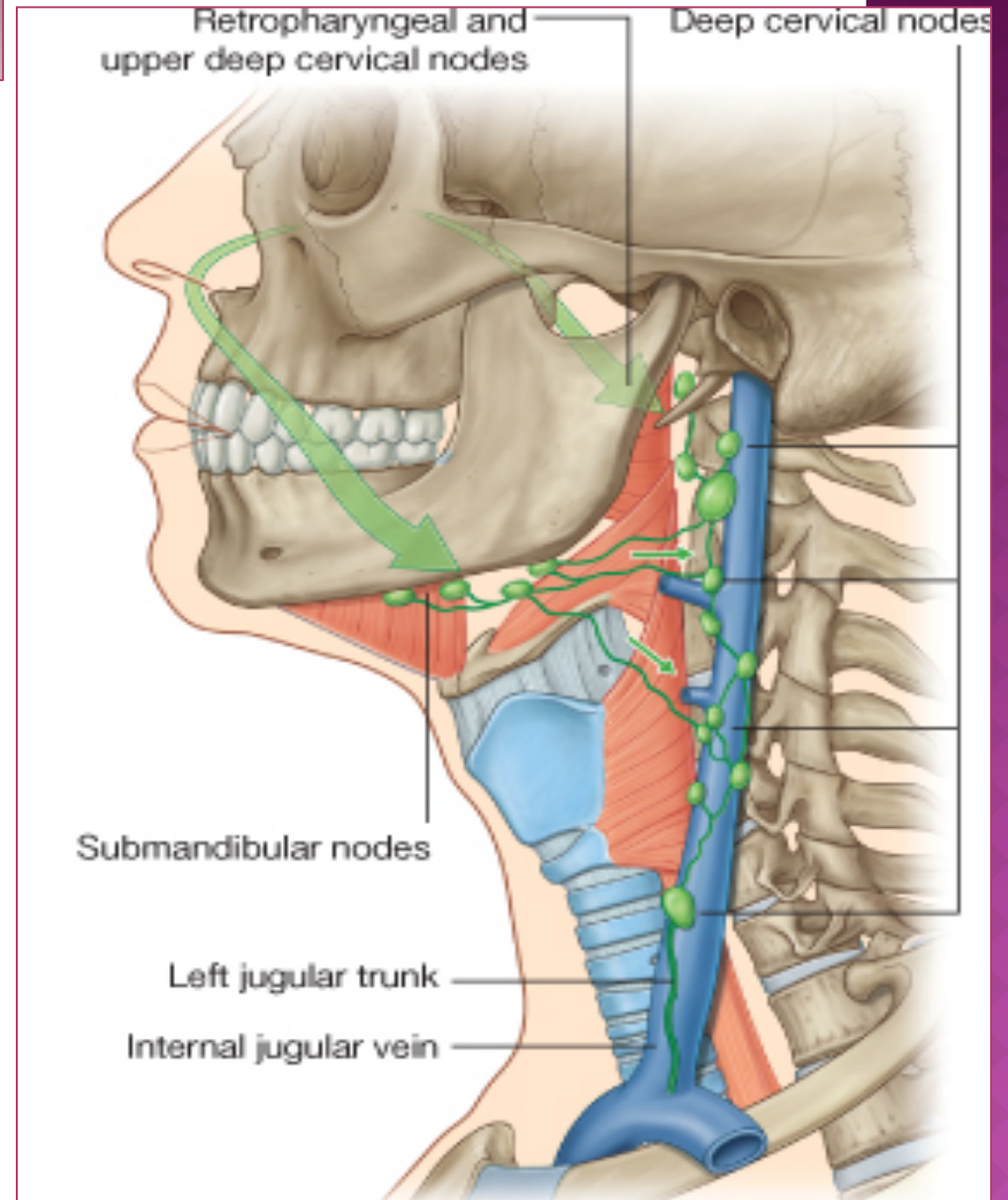
VENOUS DRAINAGE



- Venous plexus in the sub mucosa formed by veins accompanying the arteries
- They drain into cavernous sinus & pterygoid venous plexus.

LYMPH DRAINAGE

- To Submandibular &
- Upper deep cervical nodes.



THANK YOU