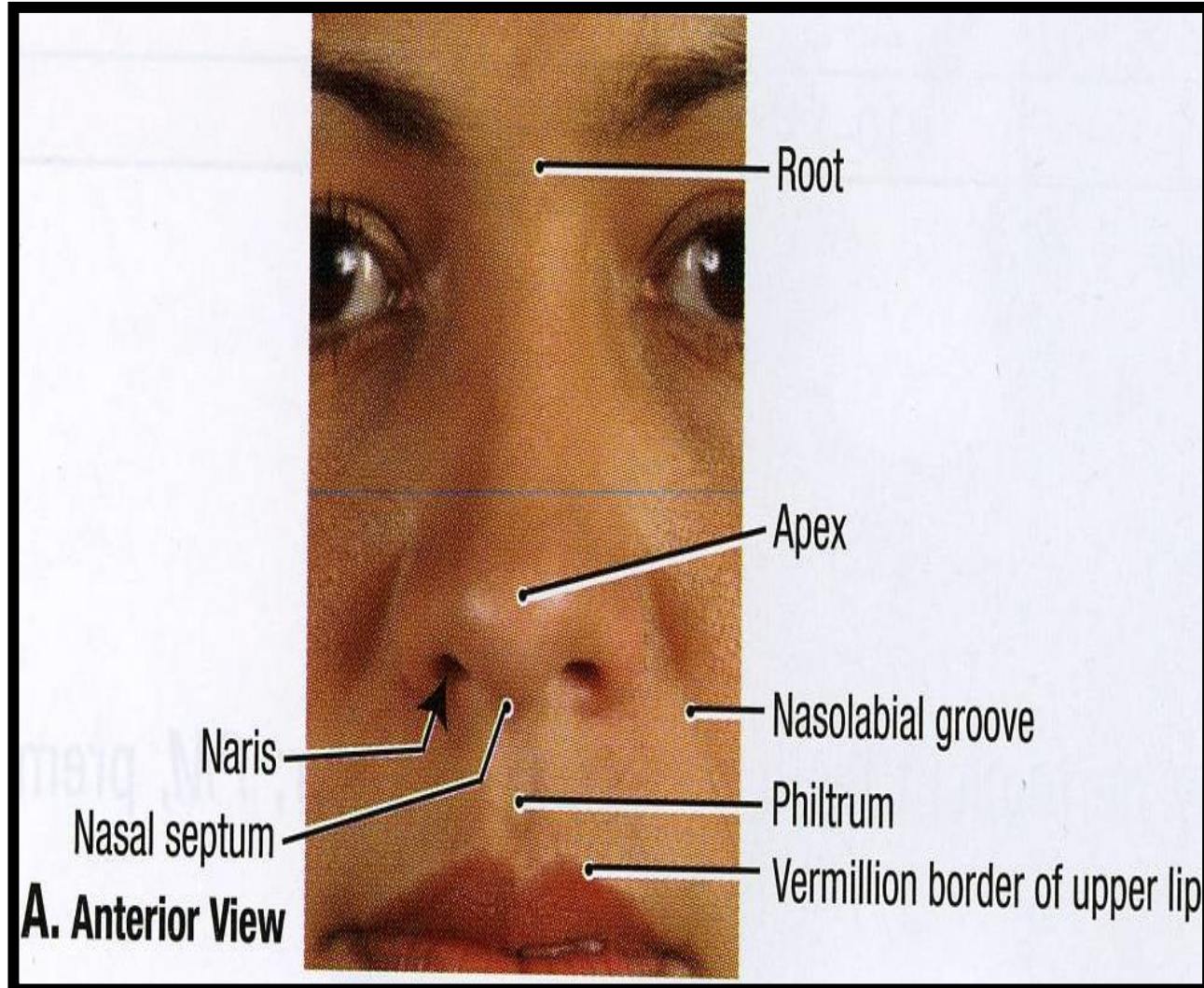


ANATOMY OF THE NOSE AND OLFACTORY NERVE

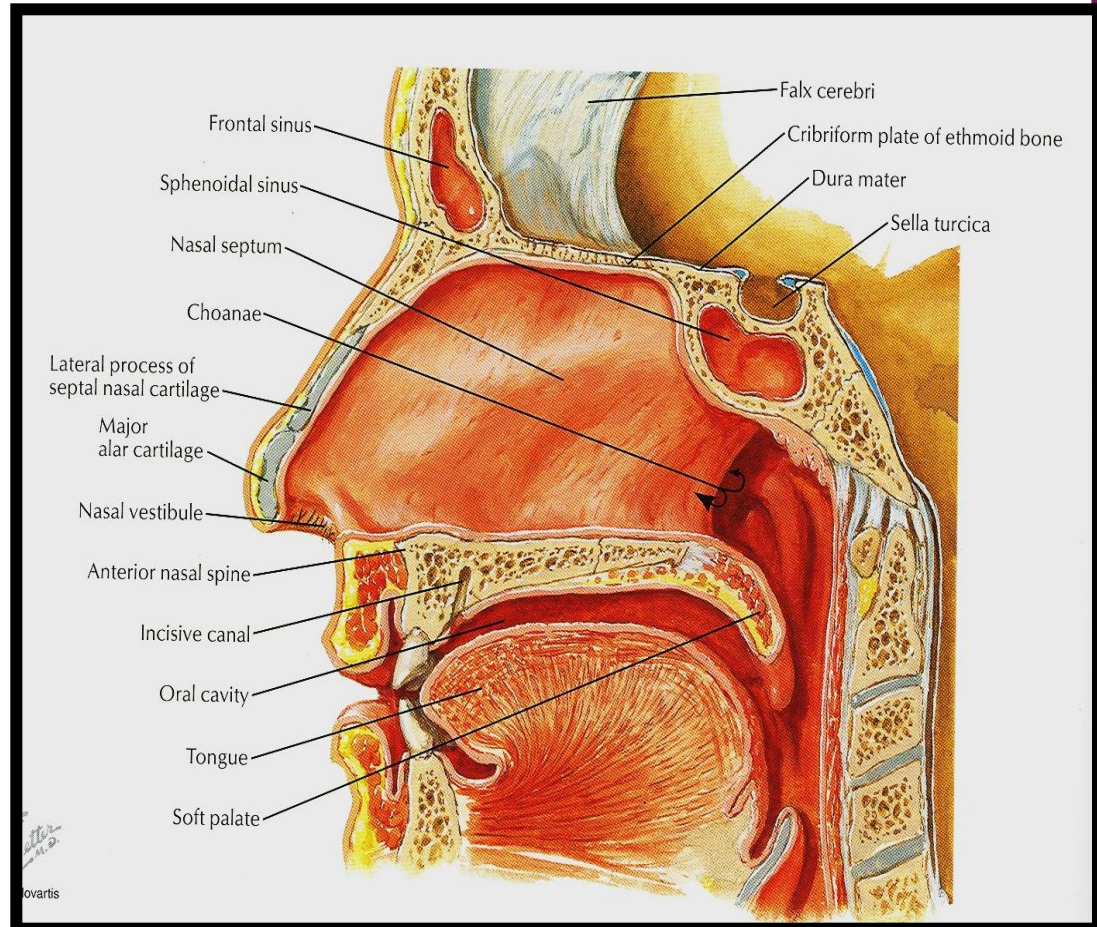


OBJECTIVES

- 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.

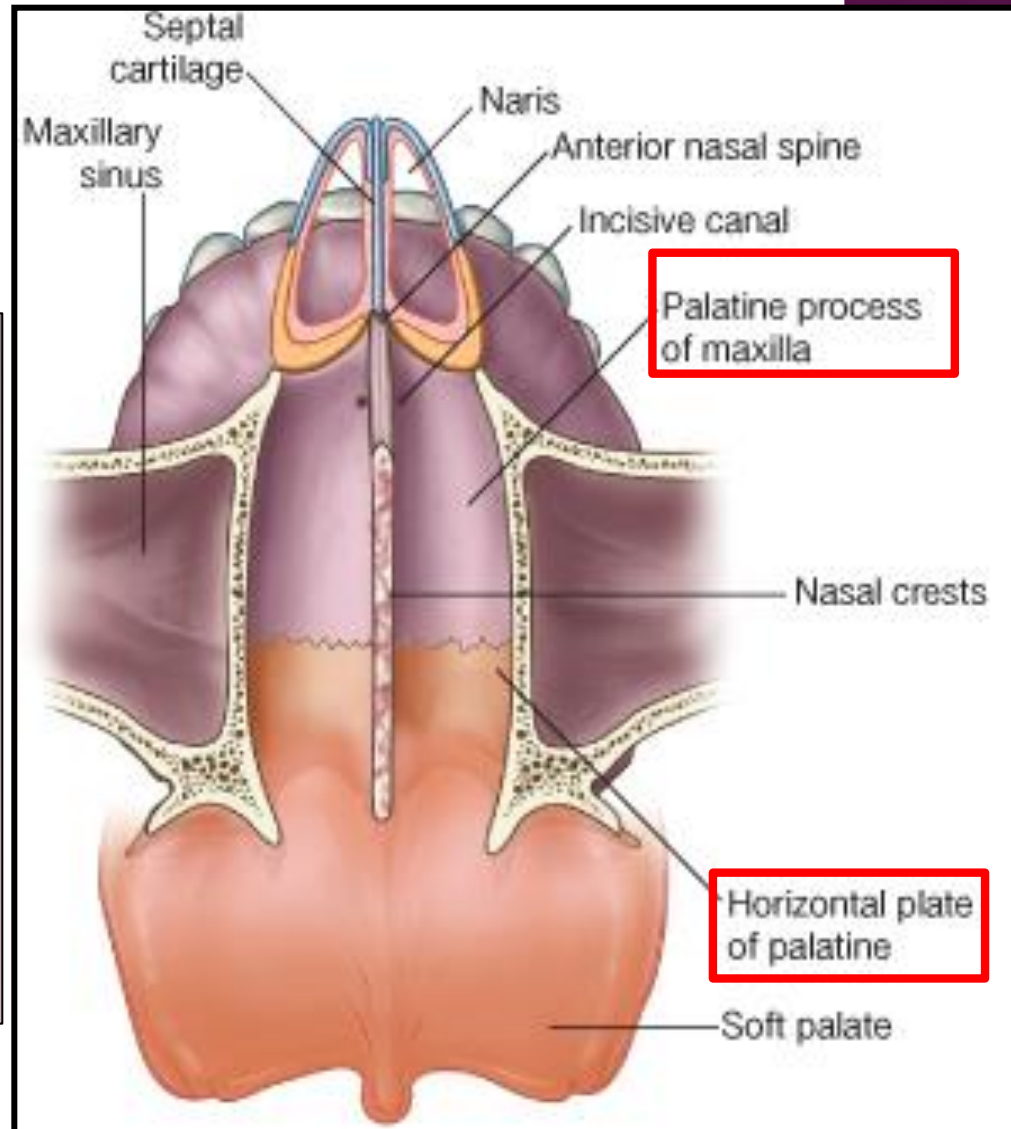
NASAL CAVITY

- 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

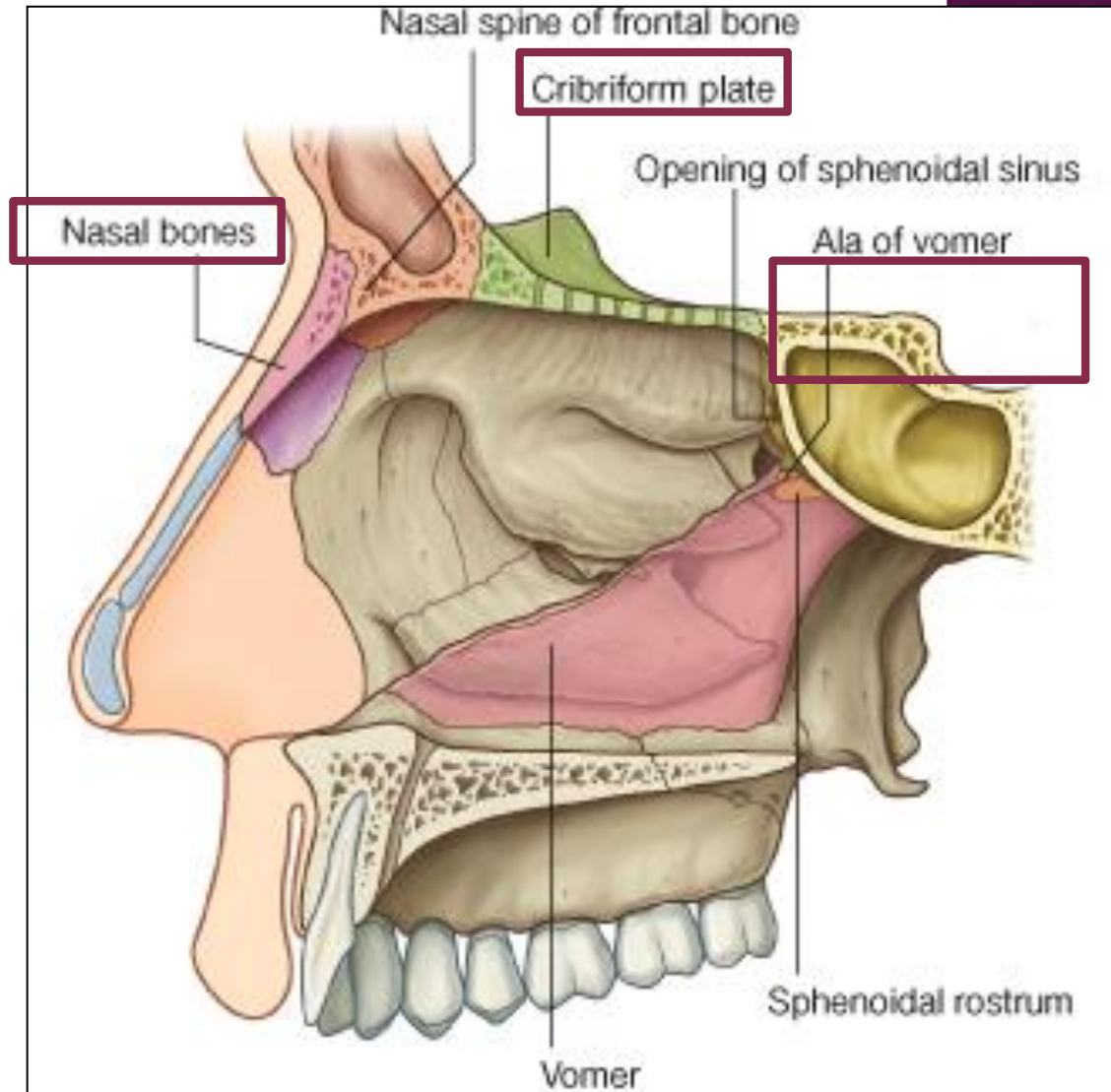
- Formed by:
- Nasal (upper) surface of the hard (bony) palate:
 - Palatine process of maxilla, **anteriorly**.
 - Horizontal plate of the palatine bone, **posteriorly**



ROOF

Formed by:

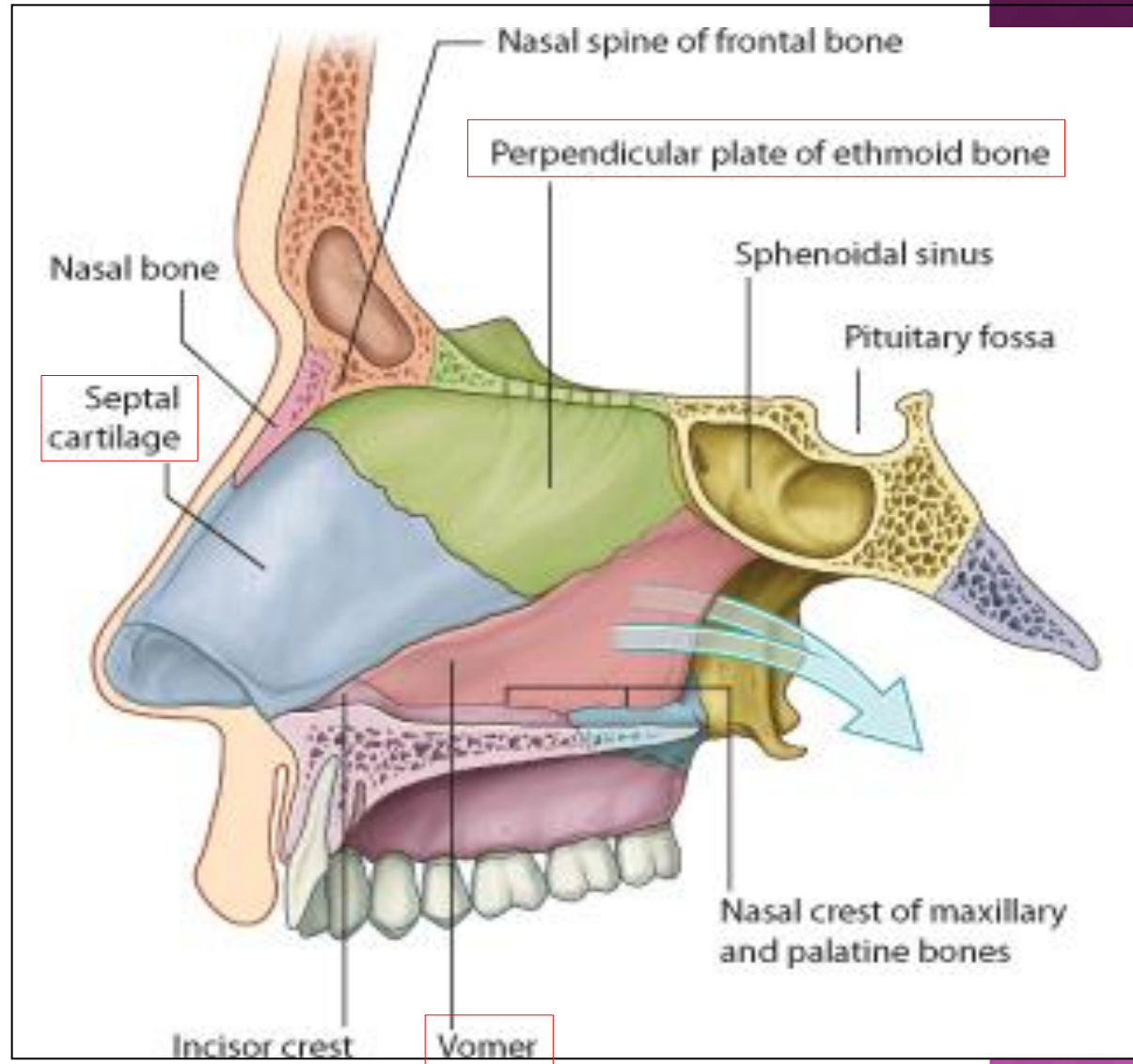
- Posteriorly
 - Body of sphenoid,
- Middle
 - Cribriform plate of ethmoid, in the Frontal,
- Anteriorly
 - nasal bones,



MEDIAL WALL

⦿ The nasal septum:

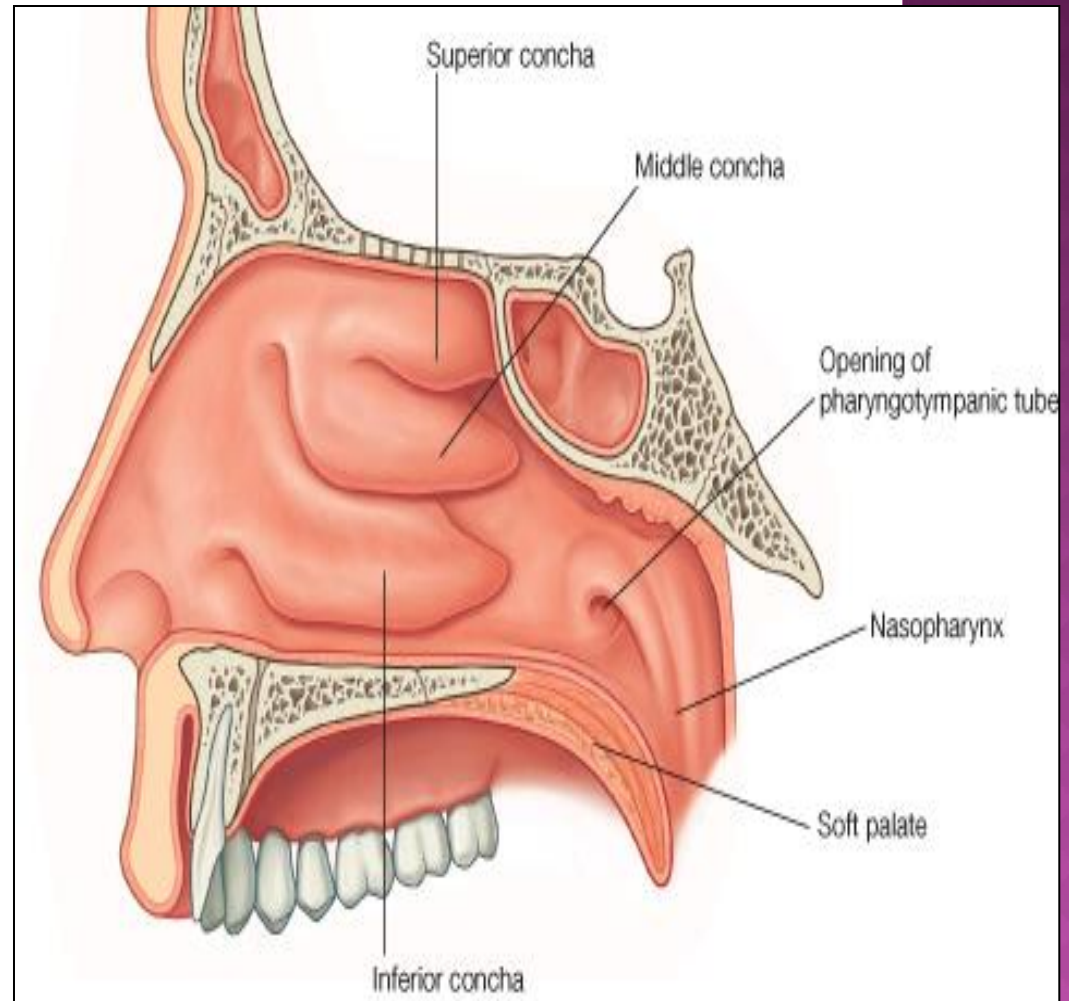
- ⦿ Vertical (perpendicular) plate of ethmoid
- ⦿ Septal cartilage
- ⦿ Vomer.



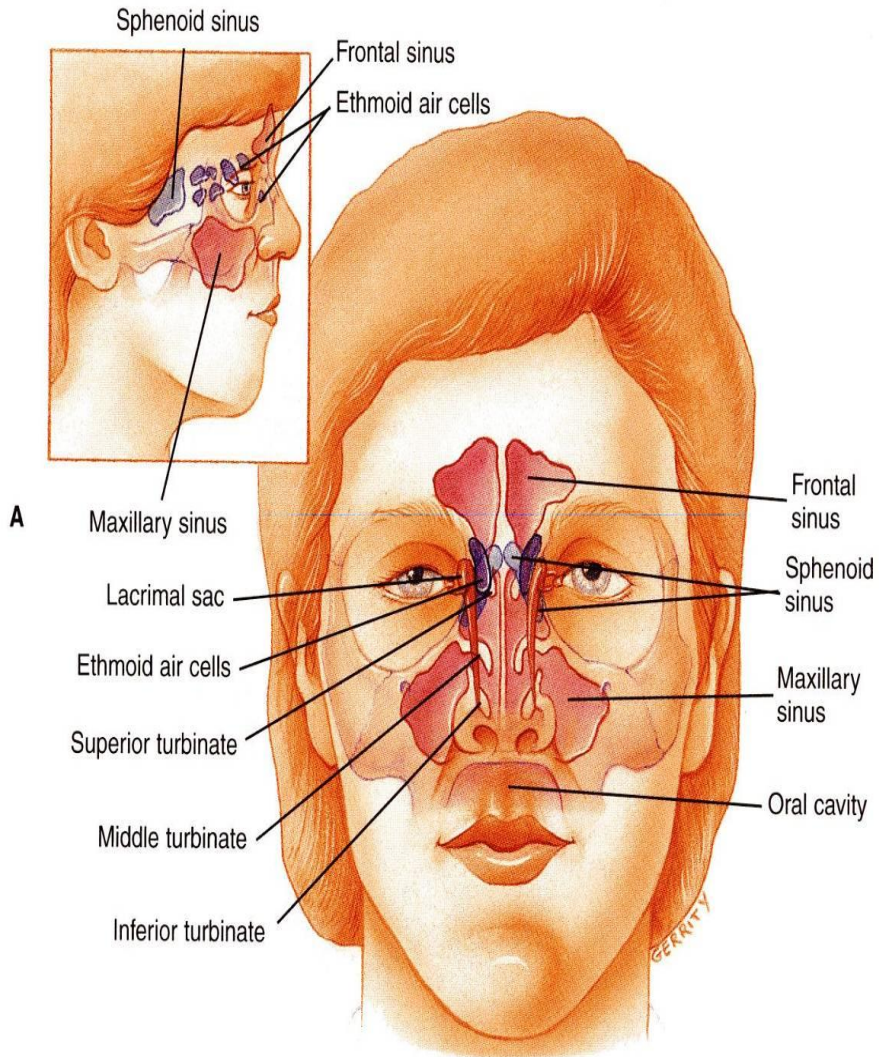
Marked by:

- Three projections (Nasal Conchae).
- Superior, middle, and inferior Nasal Conchae
- 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 (AIR) SINUSES



❖ They are cavities inside the:

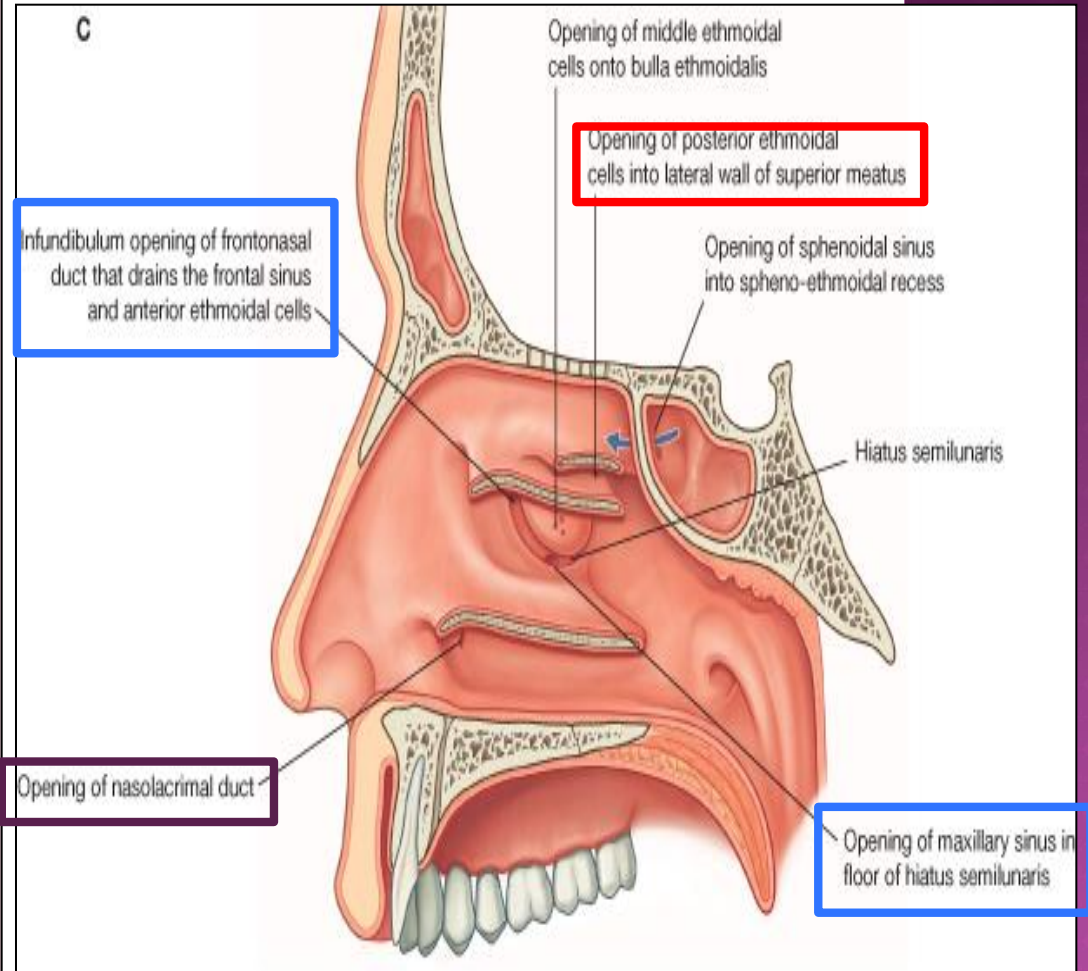
- ❖ Maxilla
- ❖ Frontal bone
- ❖ Sphenoid bone
- ❖ Ethmoid bone

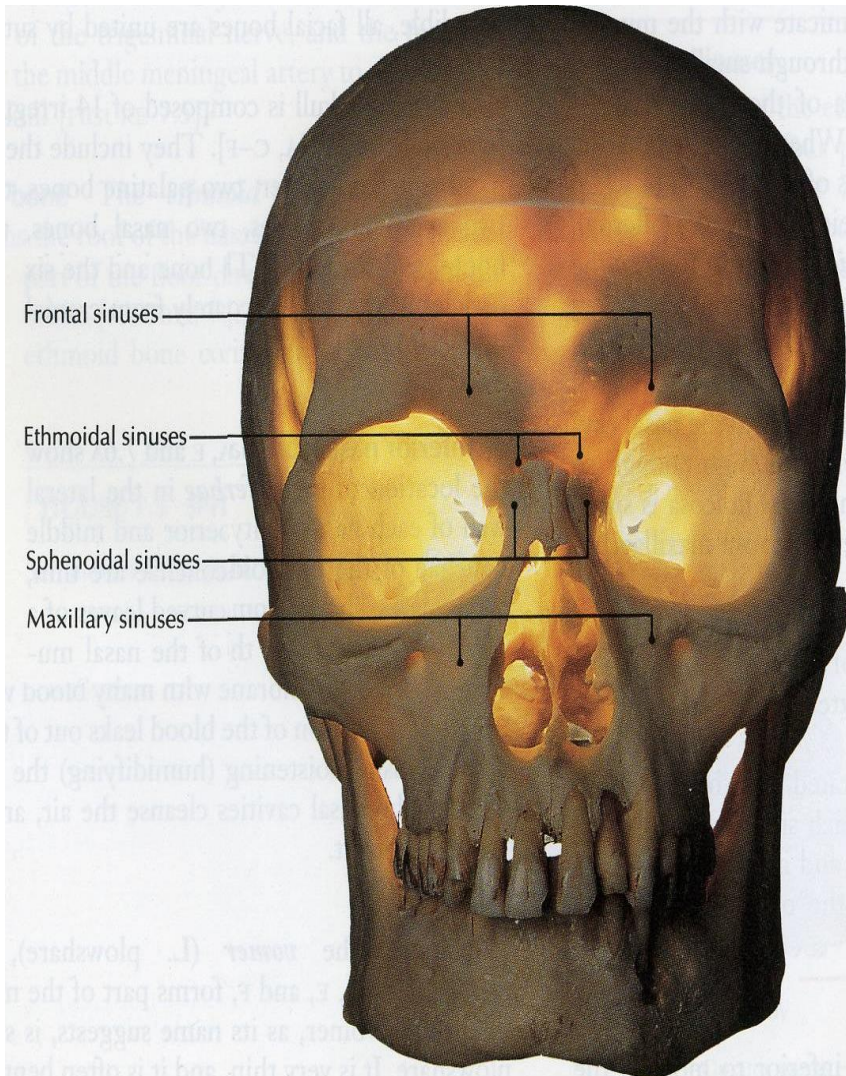
❖ They are:

- ❖ 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.

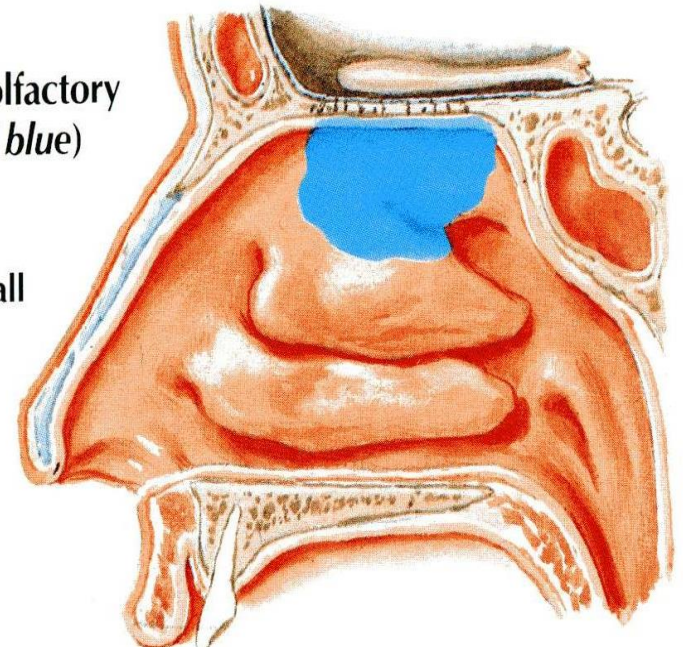
NASAL MUCOSA

Olfactory:

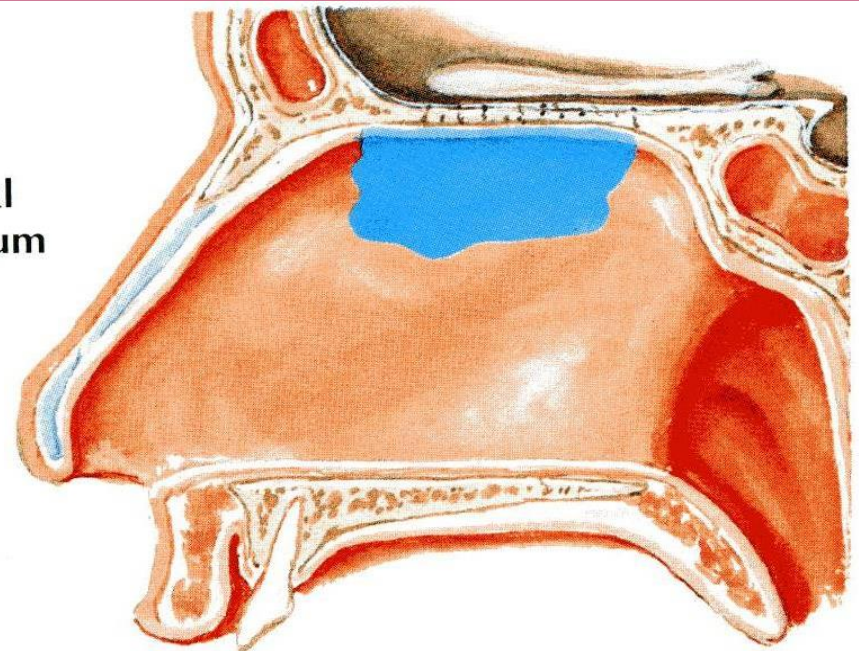
- It is delicate and contains olfactory nerve cells.
- It is present in the roof, lateral wall and upper part of nasal cavity.
- On the lateral wall, it lines the upper surface of the superior concha and the sphenoethmoidal recess.
- On the medial wall, it lines the superior part of the nasal septum.

Distribution of olfactory mucosa (shaded blue)

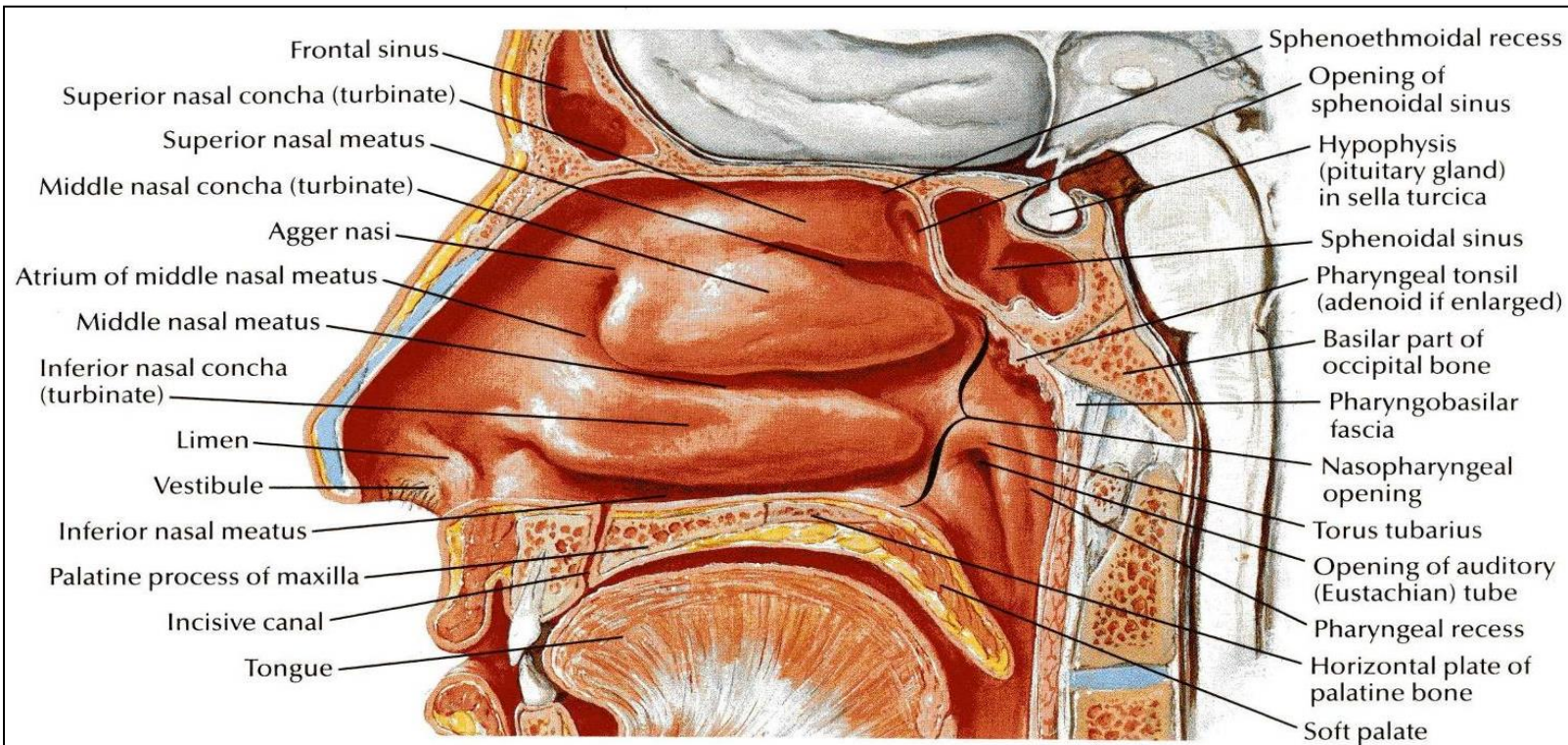
Lateral nasal wall



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**.

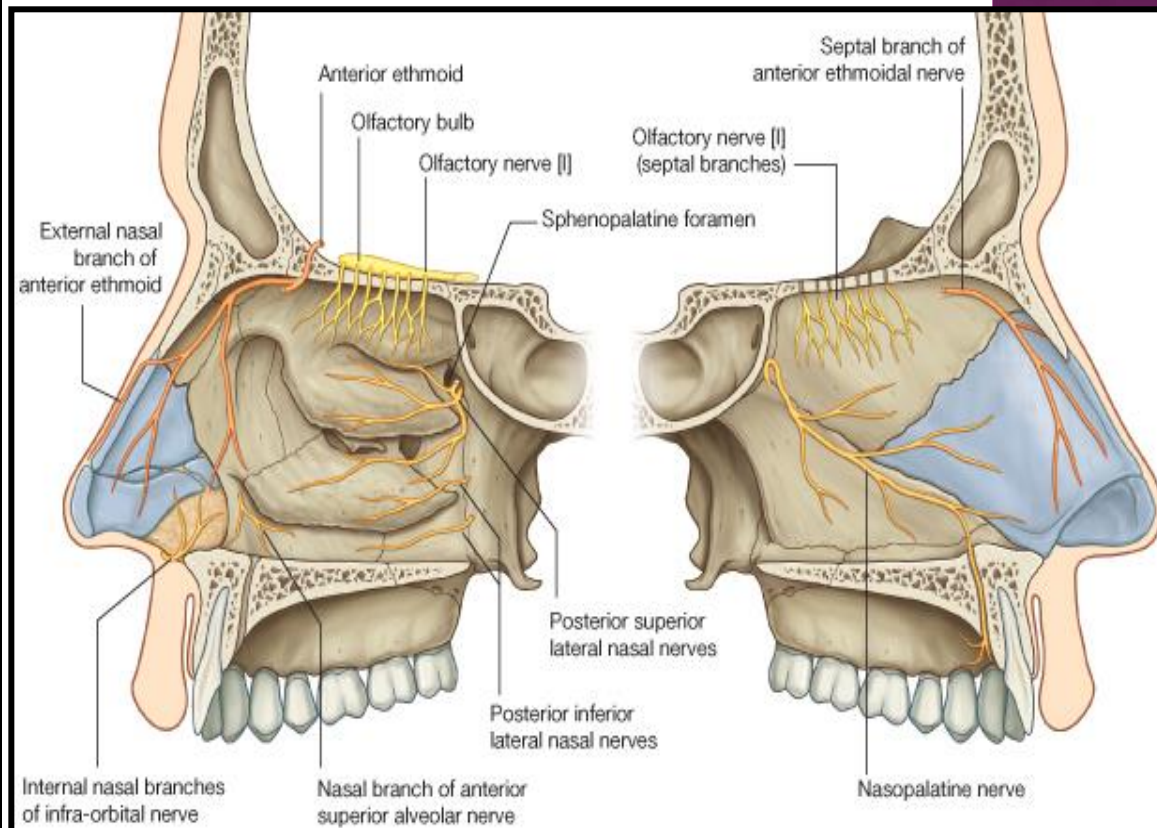
○ The nerves of **General Sensation** are derived from the **Ophthalmic & Maxillary** divisions of *trigeminal nerve*.

○ 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*

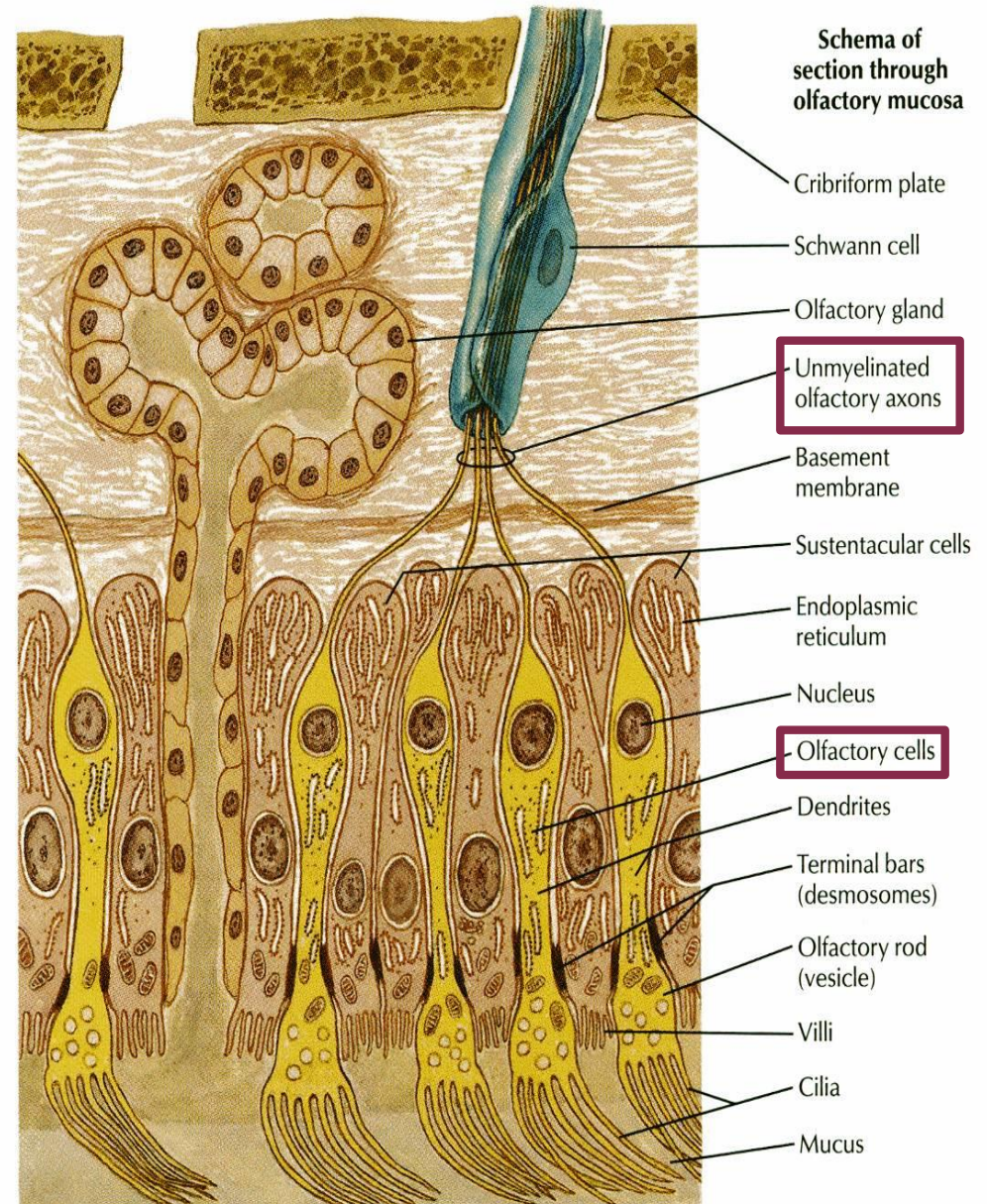
NERVE SUPPLY



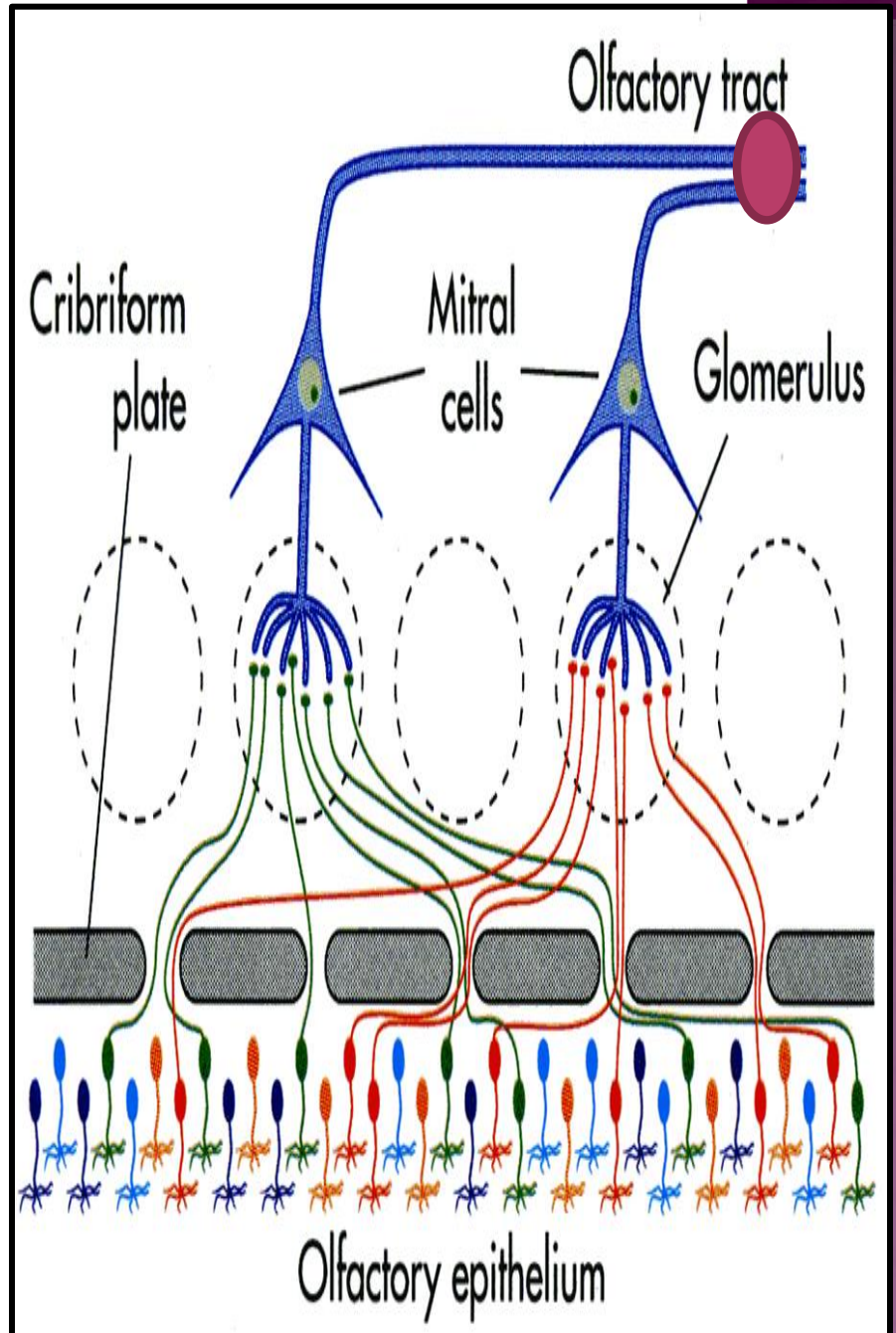
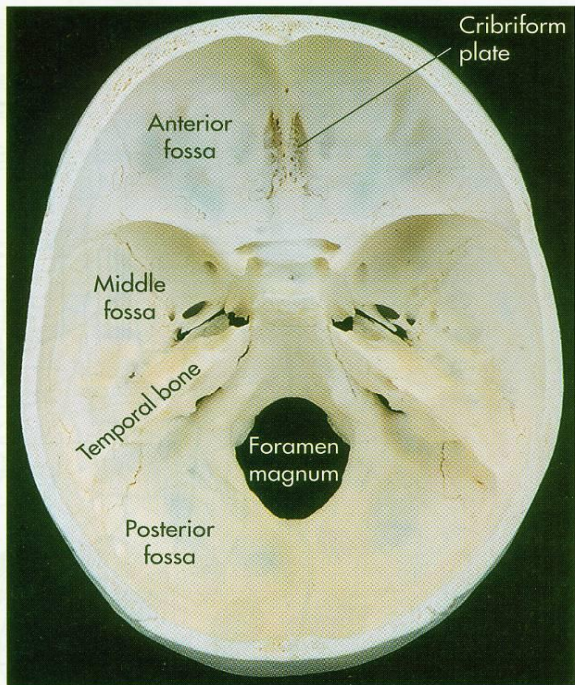
OLFACTORY PATHWAY

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 in the olfactory tract.



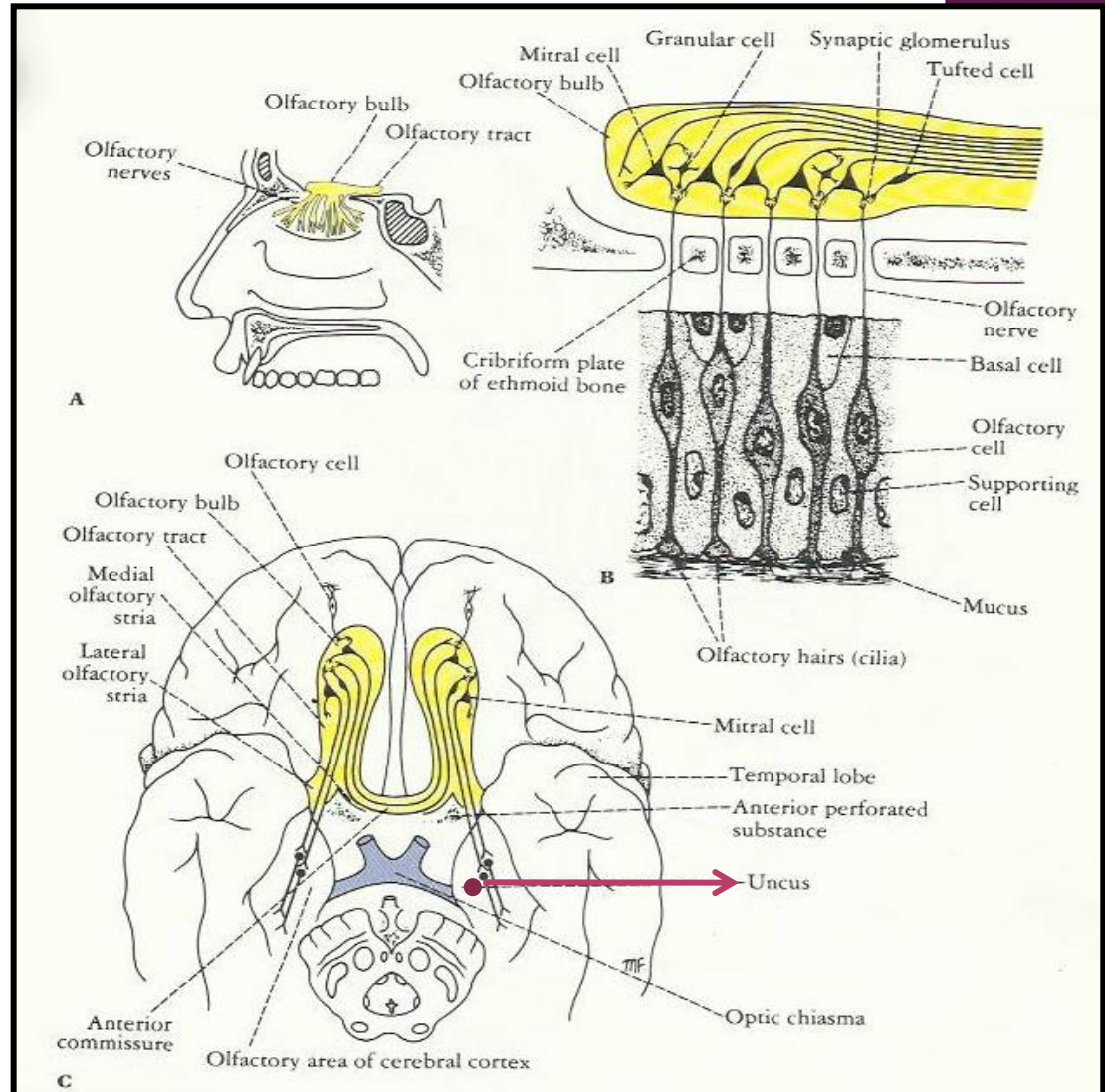
2nd neurone:

- 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)**

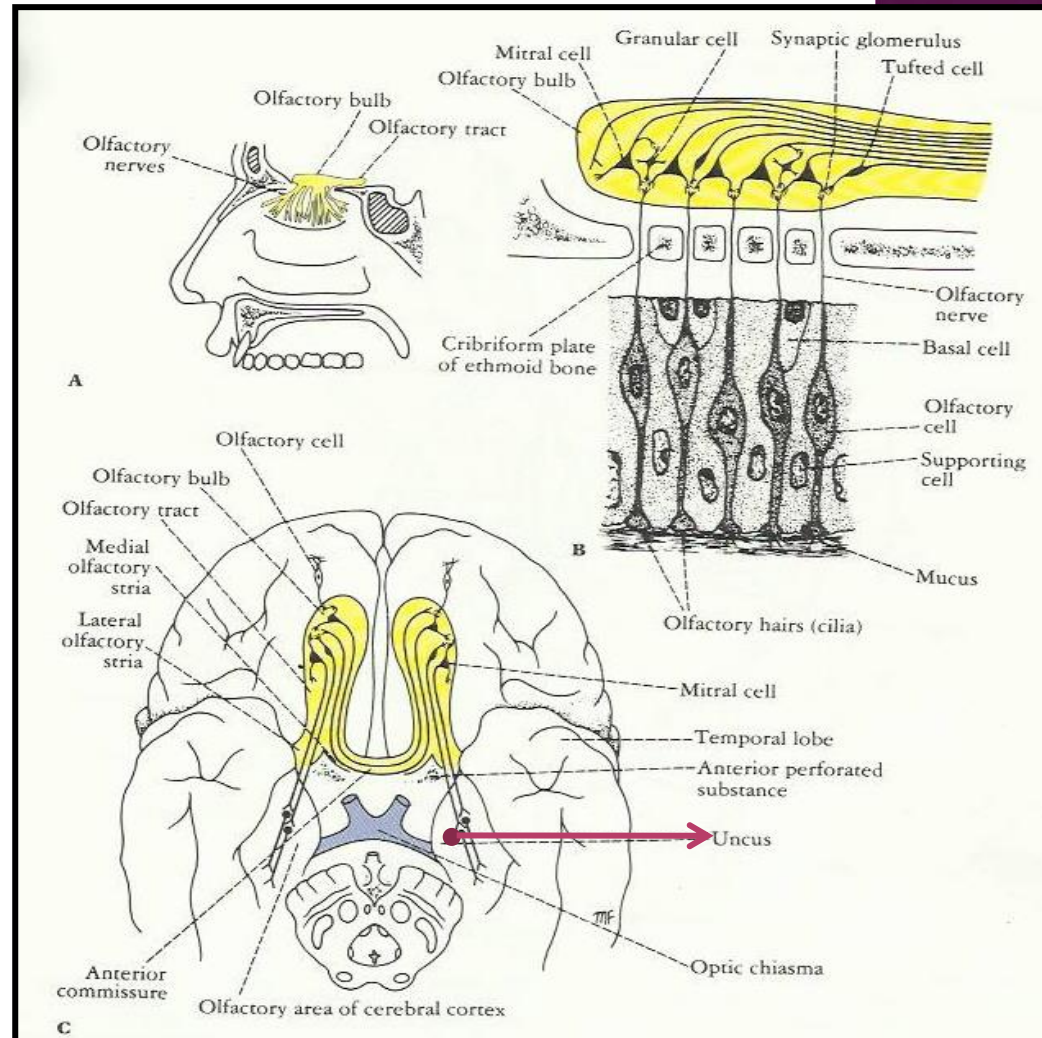
OLFACTORY PATHWAY



OLFACTORY PATHWAY

Medial root:

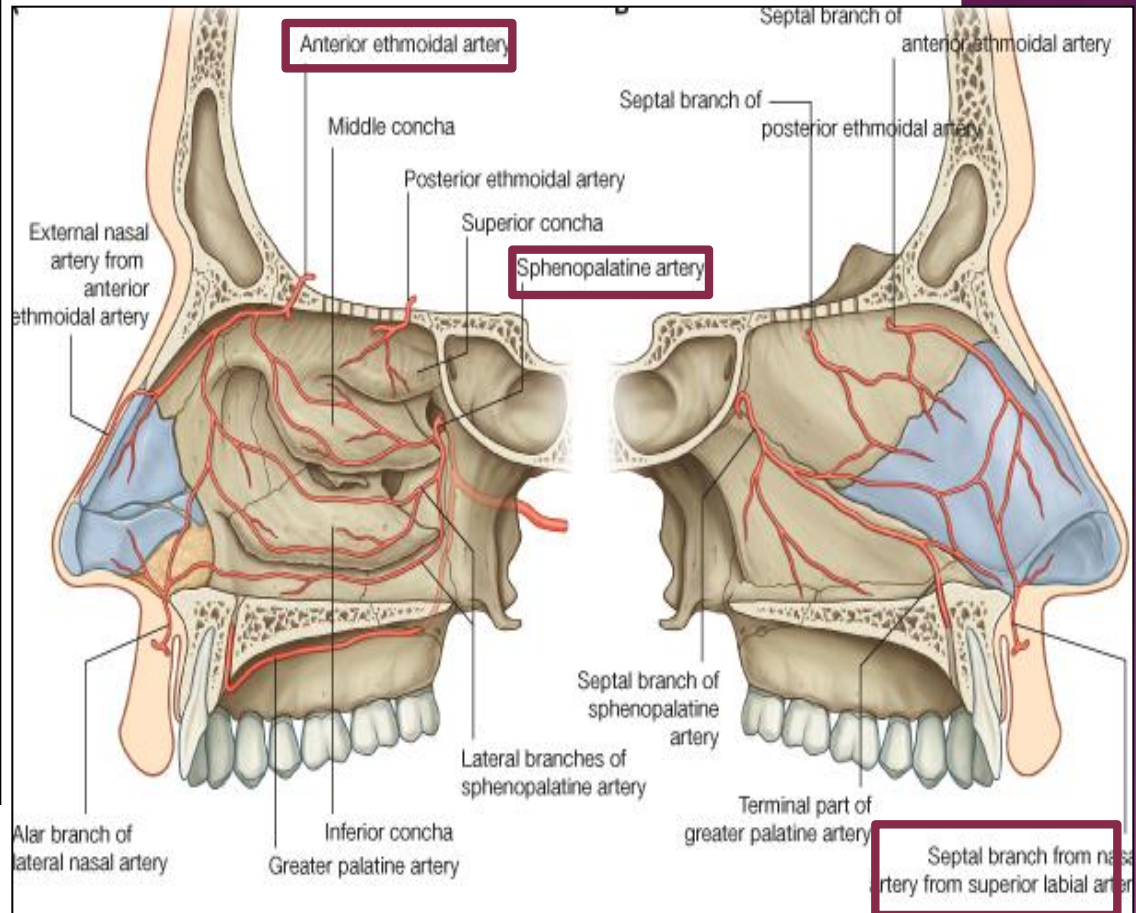
- Crosses midline through **anterior commissure** and joins the uncrossed lateral root of opposite side.
- It connects olfactory centers of 2 cerebral hemispheres.
- So each olfactory centre receives smell sensation from both halves of nasal cavity.
- **NB: Olfactory pathway is the only sensory pathway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



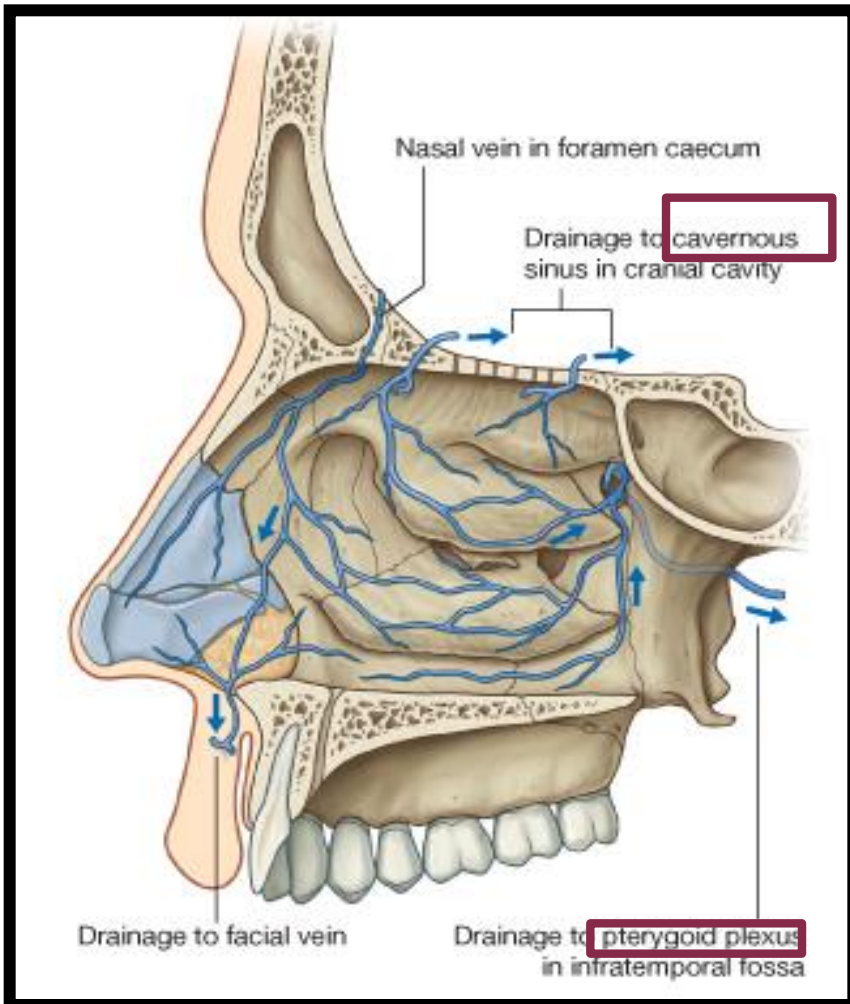
ARTERIAL SUPPLY

- Sphenopalatine artery (maxillary)
- Ethmoidal anterior and posterior (ophthalmic)
- Superior labial (facial)

- Applied anatomy:
- Rich arterial anastomosis on **anterior & inferior part of nasal septum (Little's area)** is the most common site for epistaxis



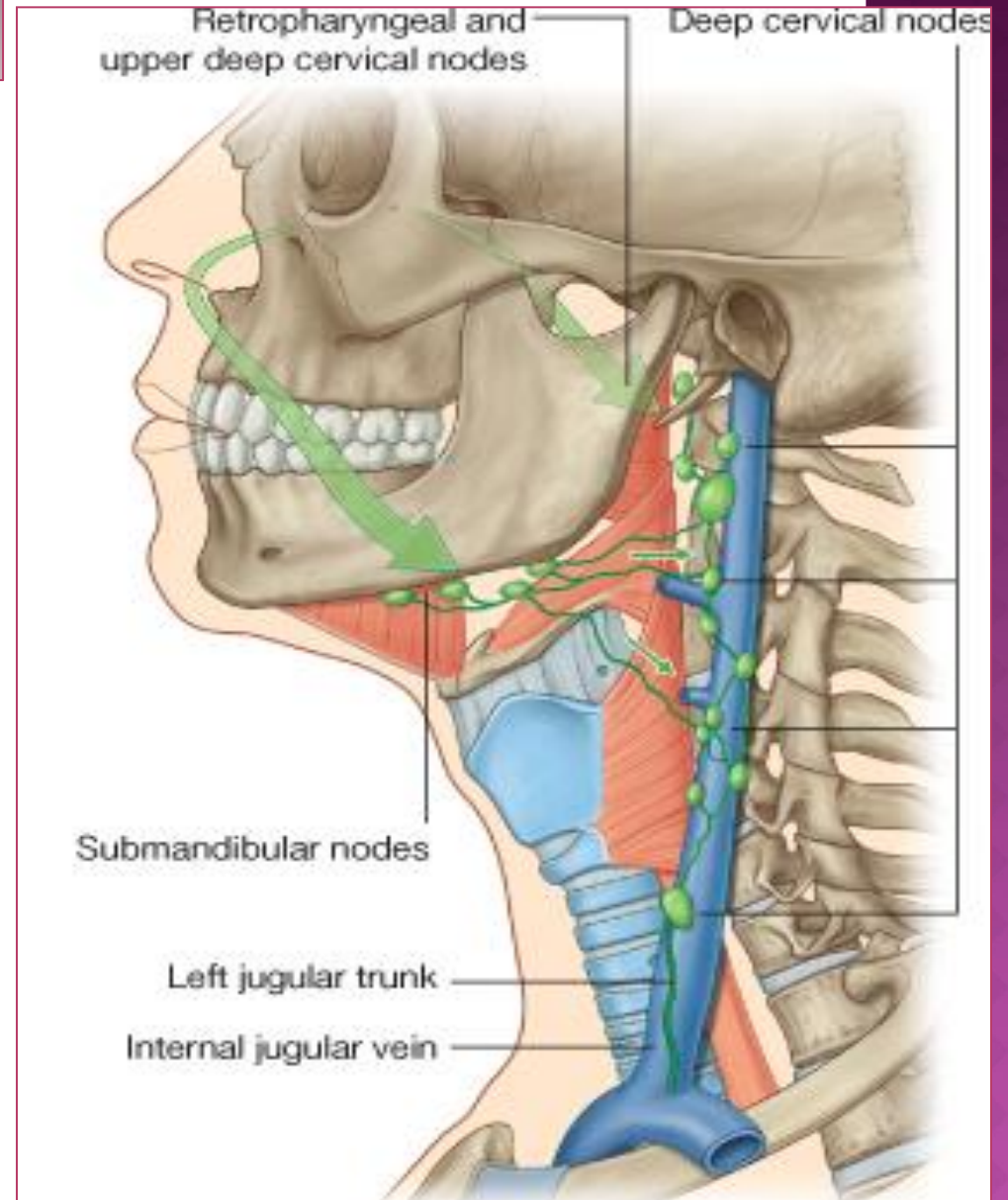
VENOUS DRAINAGE



- ⦿ Venous plexus in the sub mucosa formed by veins accompanying the arteries

LYMPH DRAINAGE

- ⊙ Submandibular nodes
- ⊙ Upper deep cervical nodes.



Thank You