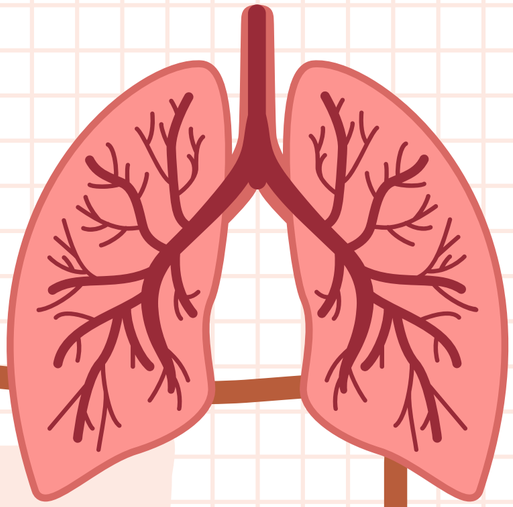
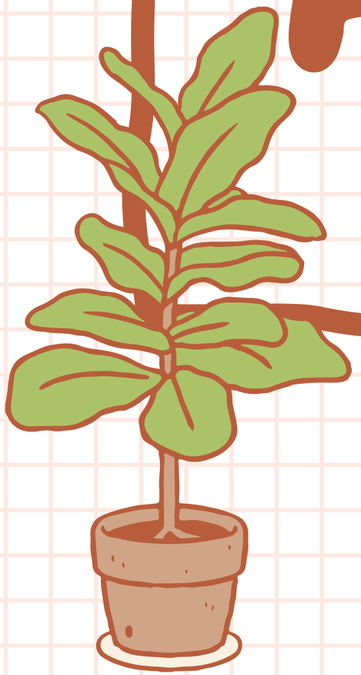


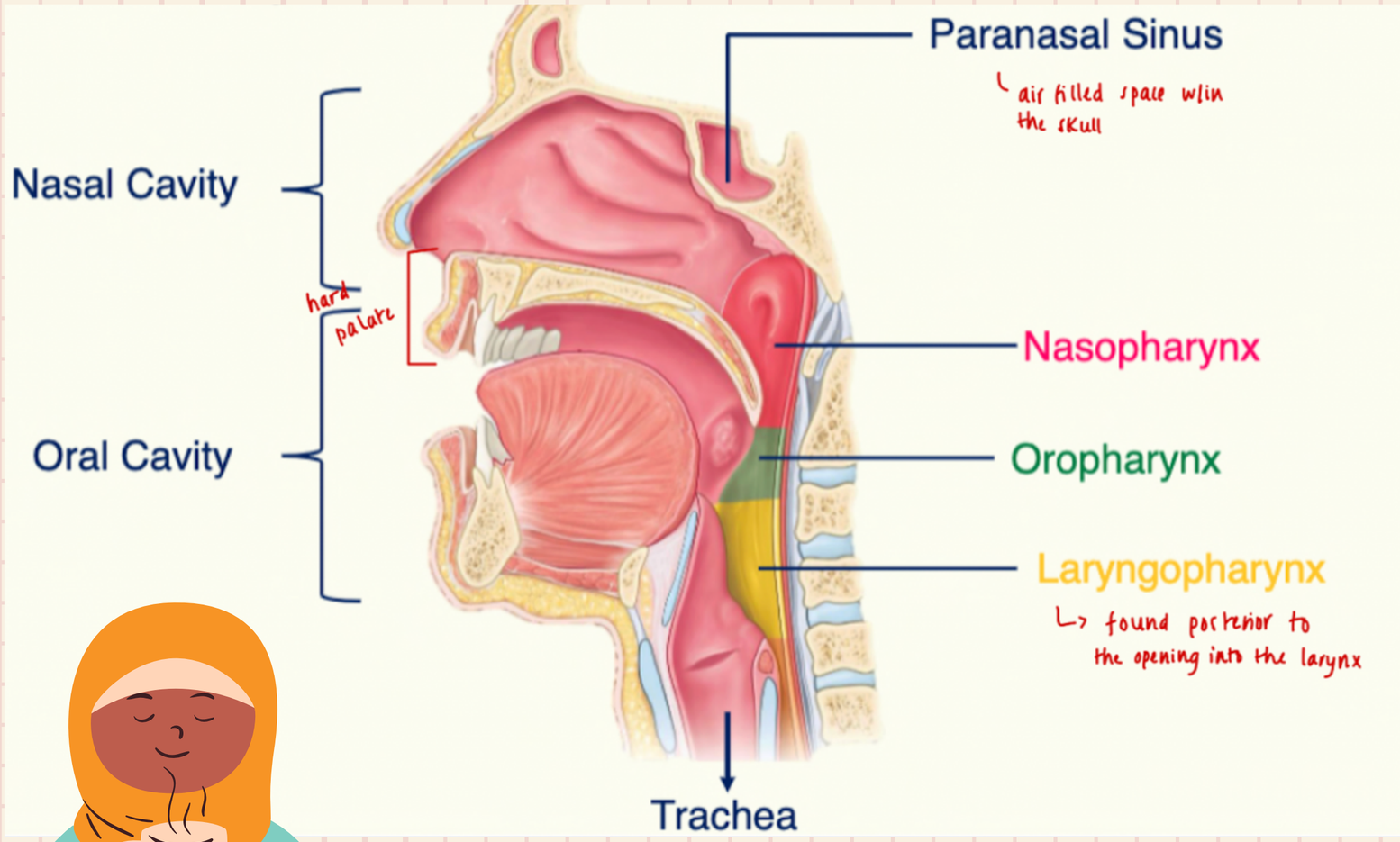
RESP ANATOMY, P1



GENERAL UPPER ANATOMY

FUNCTIONS OF NASAL CAVITY

- 1. Adjust temperatures to avoid damaging the delicate lung tissue
- 2. Adjust humidity as if the olfactory epithelium dries out then smell wont work
- 3. Trap and remove particulate matter at the anterior aperture of the nasal cavity
- 4. Drain paranasal sinuses into the lateral wall of the nasal cavity
- 5. Olfaction



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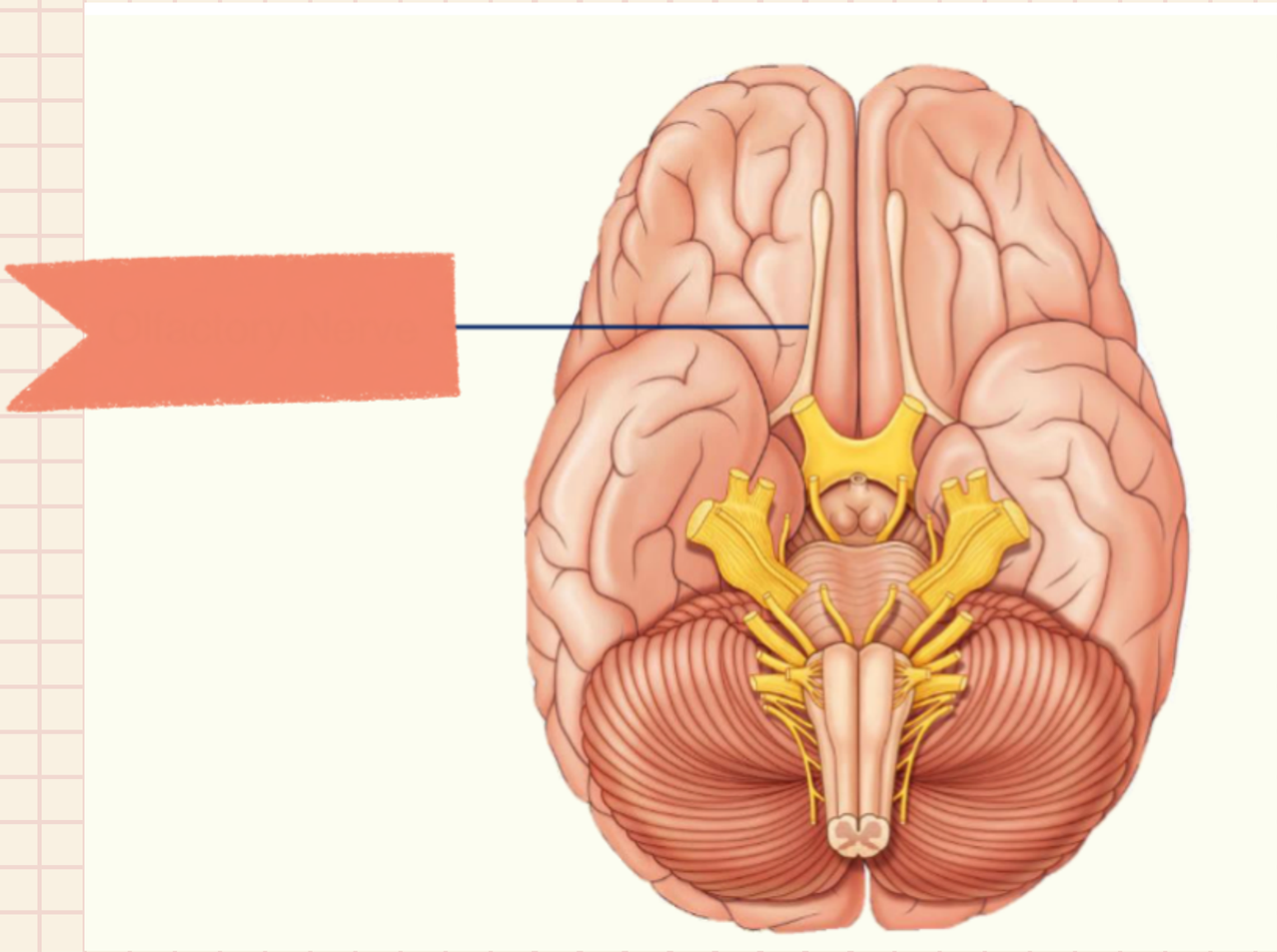

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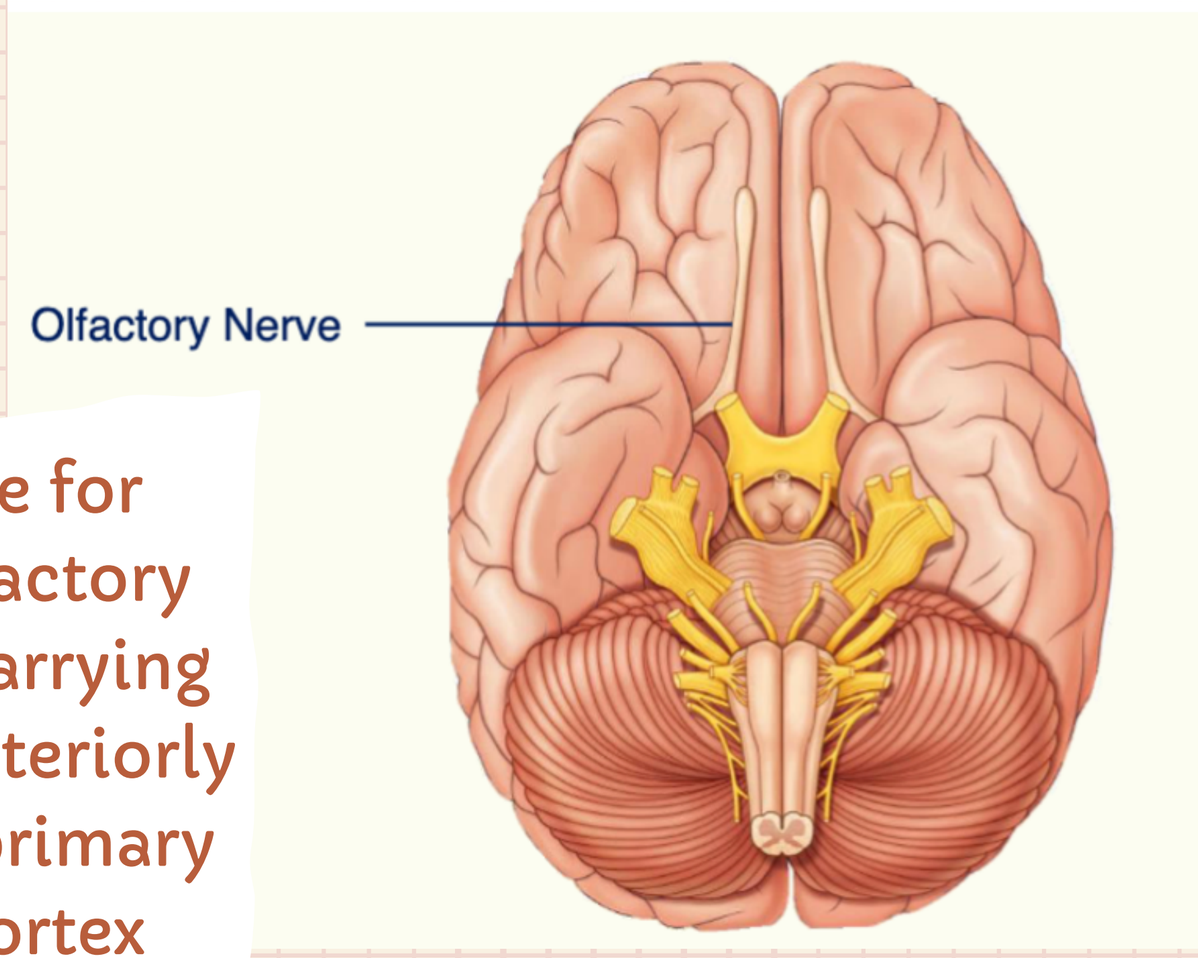
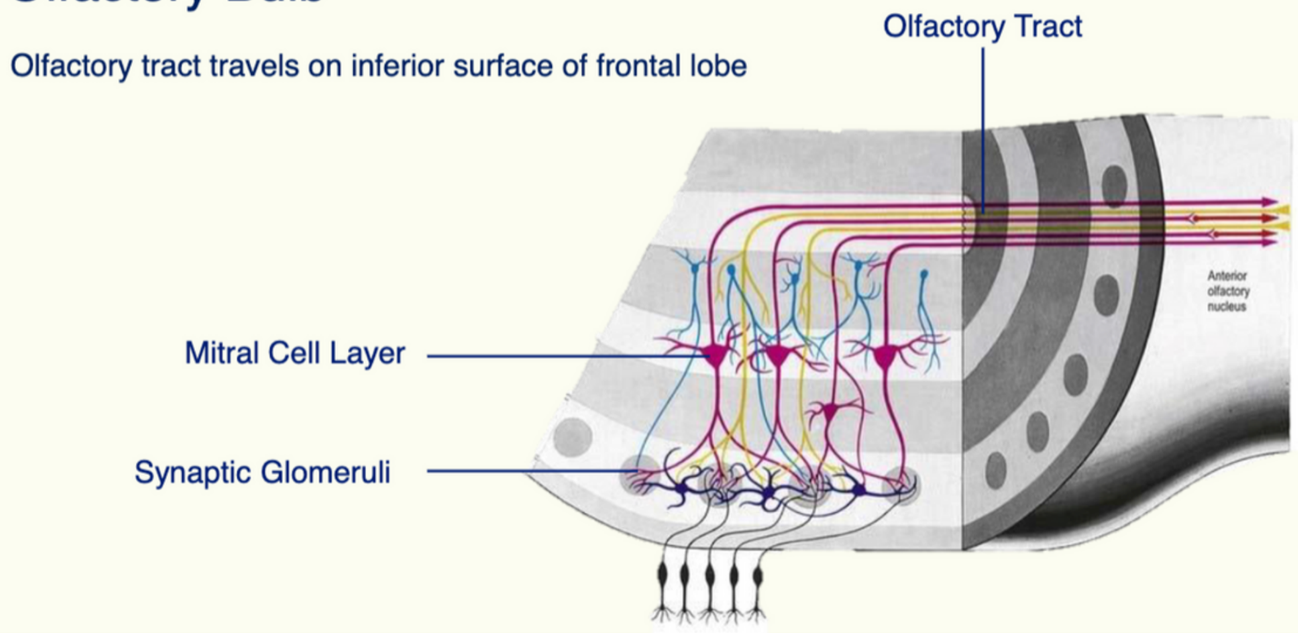
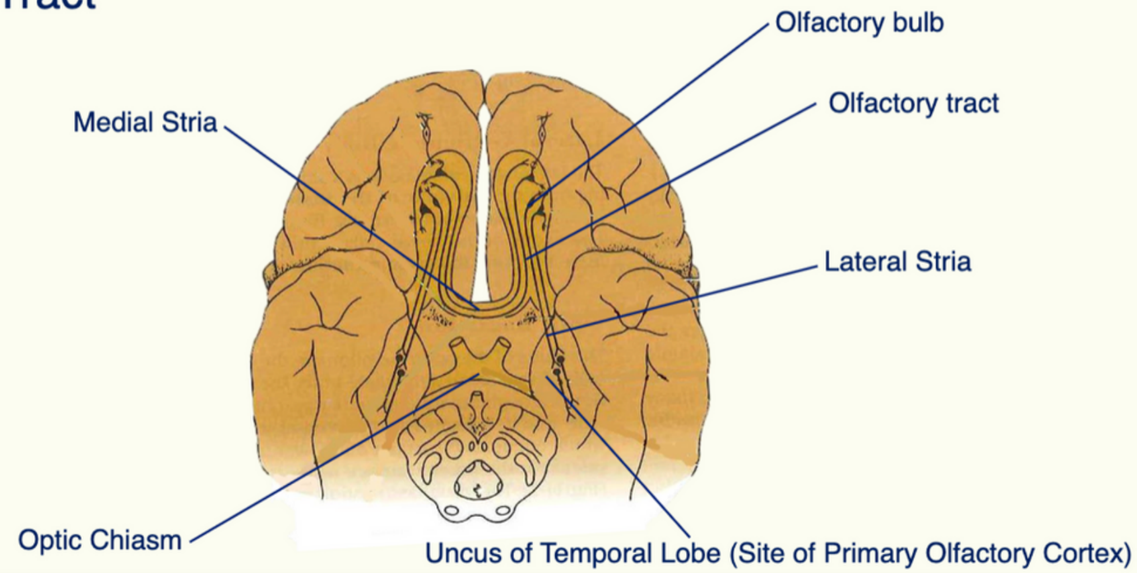


Responsible for receiving olfactory stimuli and carrying this signal posteriorly towards the primary olfactory cortex

Olfactory Bulb

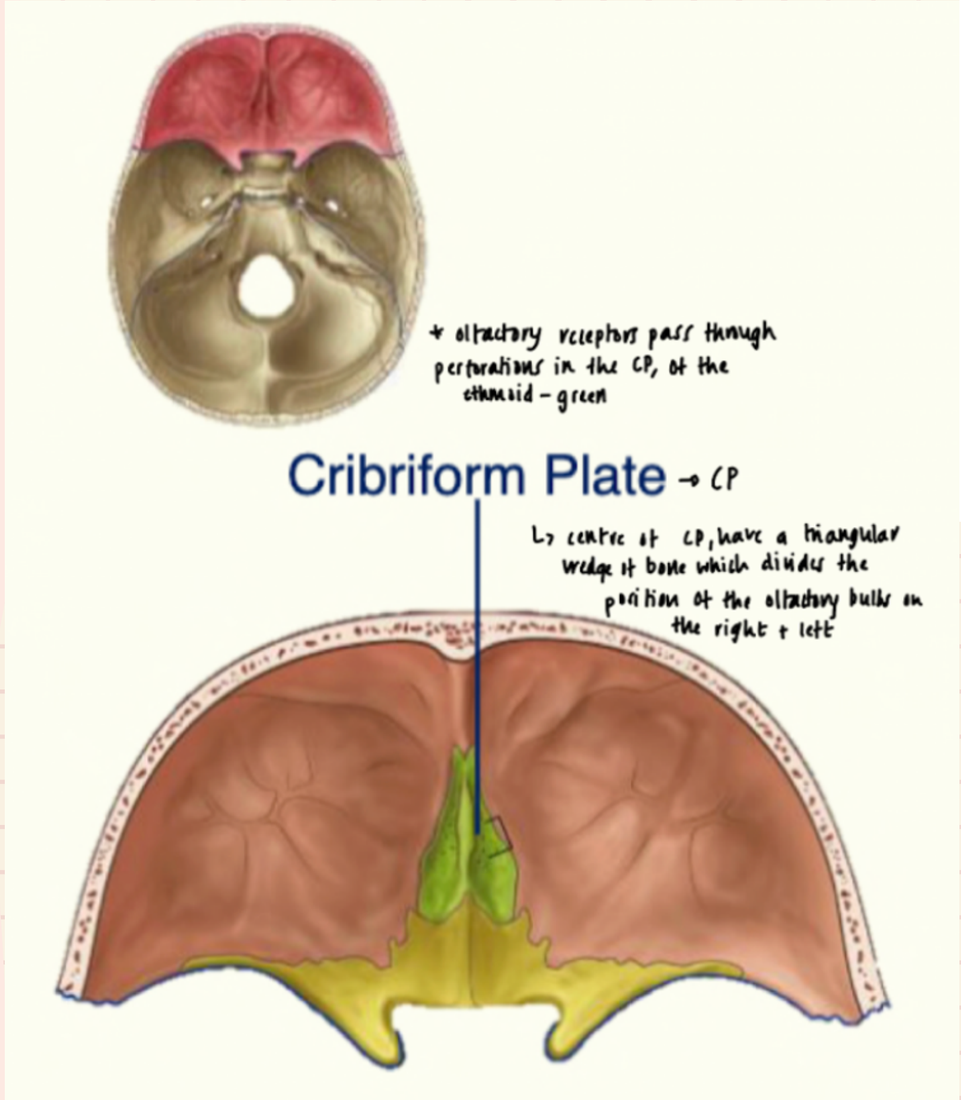


Olfactory Tract



- Olfactory receptors embedded within olfactory epithelium (the spheno-ethmoidal recess) at the apex of each nasal cavity
- Receptors are peripheral processes of bipolar sensory neurones, with cell bodies deeper in epithelium
- Axons of first order bipolar neurones pass through the cribriform plate to synapse with second order neurones in the olfactory bulb

- The cribriform plate is part of the ethmoid bone
- It helps to support the olfactory bulb
- Located in anterior cranial fossa
- The triangular wedge of bone in the cribriform plate divides the position of the olfactory bulbs on the right and left



Anosmia → loss/ change of smell/ olfaction

Temporary

- infection ie meningitis
- local disorders of the nose ie common cold

Permanent

- head injury
- tumours which occur in the olfactory groove ie meningioma

Progressive

- neurodegenerative conditions → parkinson's or alzheimers disease

THE CRIBRIFORM PLATE IS PART OF WHICH BONE?

A. Palatine

B. Palatine

C. Ethmoid

D. Nasal

THE CRIBRIFORM PLATE IS PART OF WHICH BONE?

C. Ethmoid

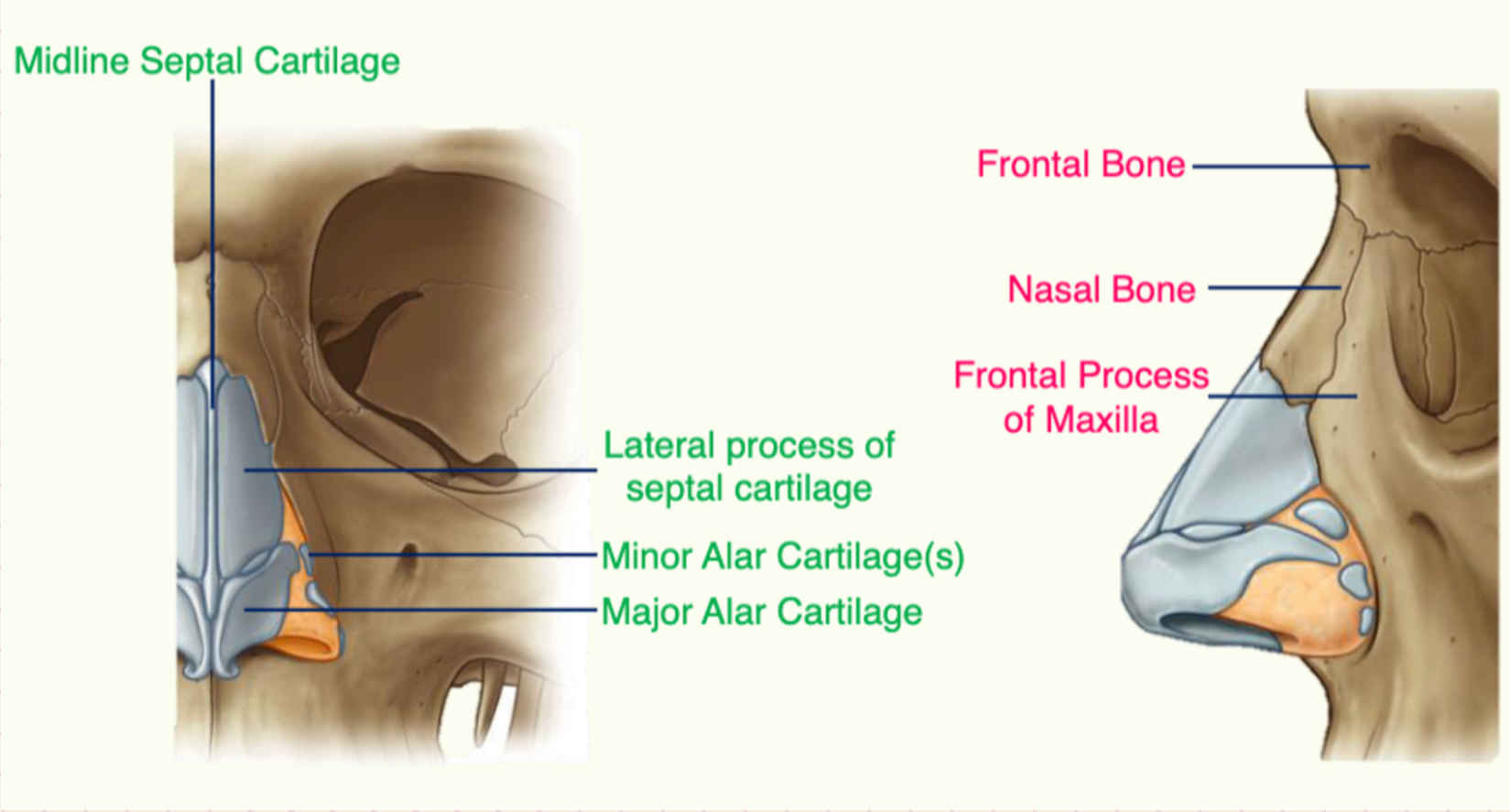
EXTERNAL NOSE

3 Bones: (pink)

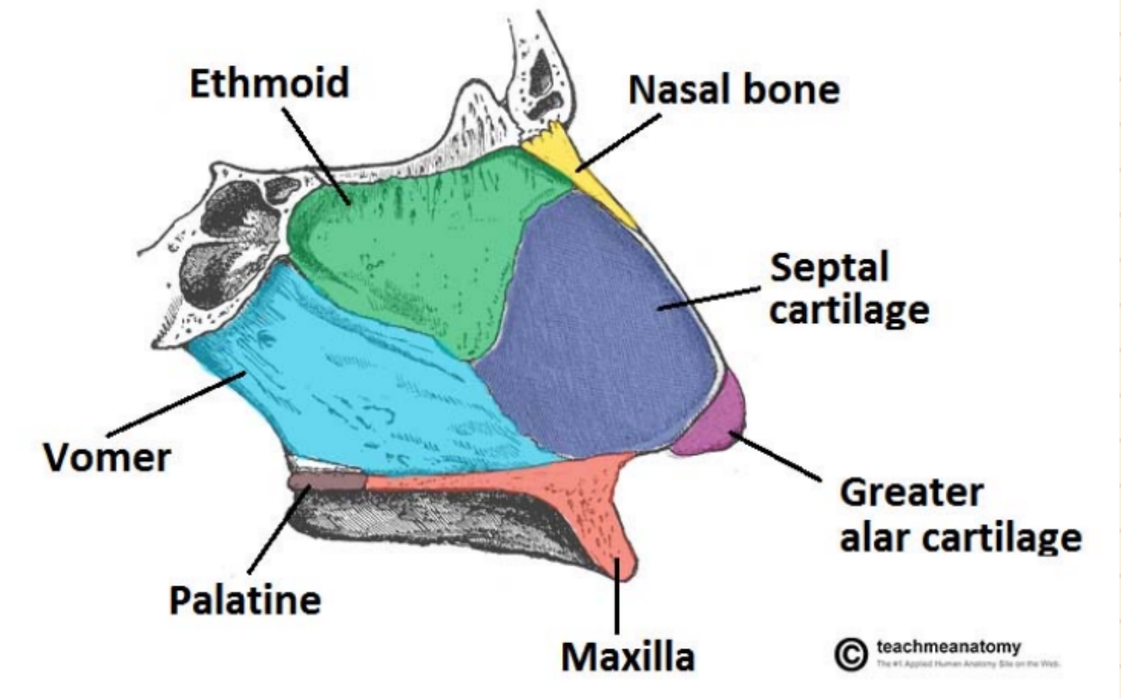
1. Frontal process of maxilla
2. Nasal bone
3. Frontal bone

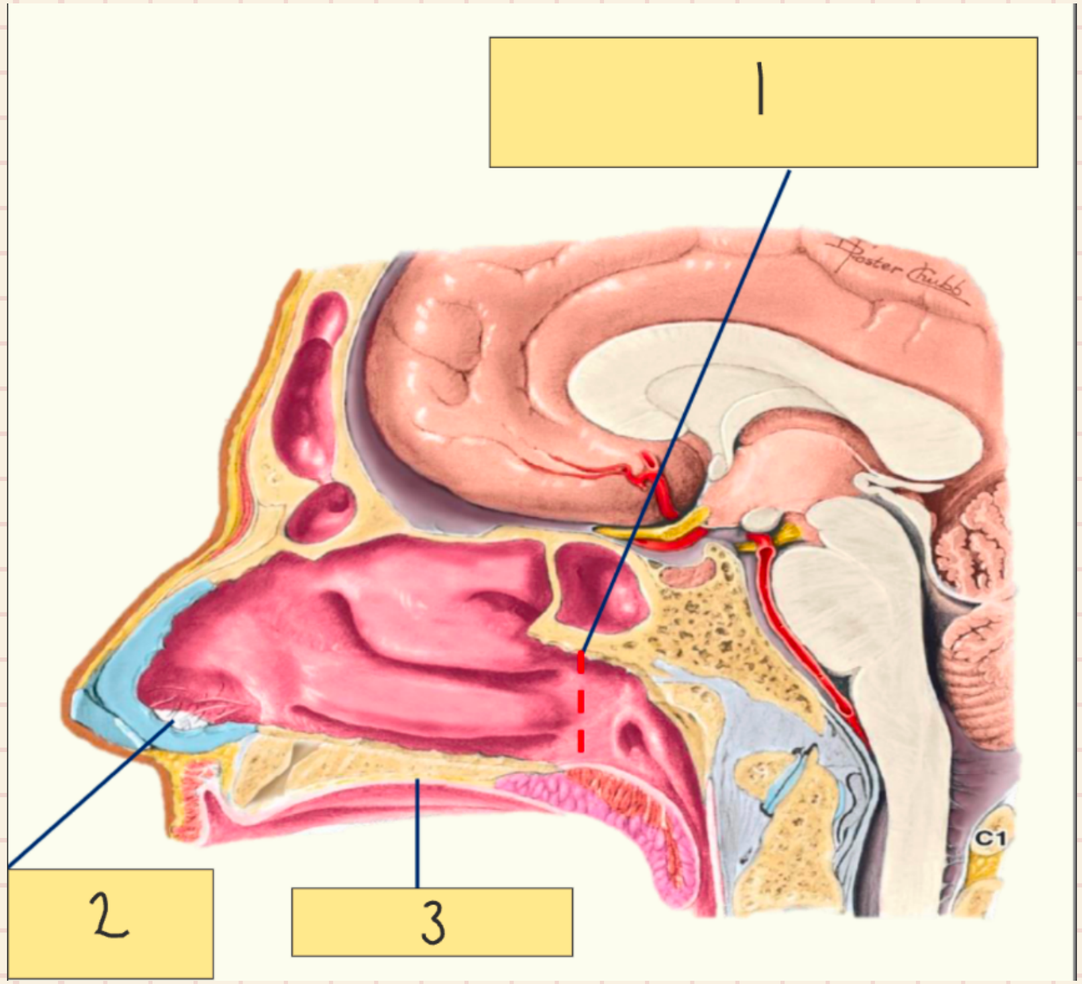
2 Septal + 2 Alar Cartilages

- Midline and Lateral Septal
- Minor and Major Alar



INTERNAL NASAL CAVITY

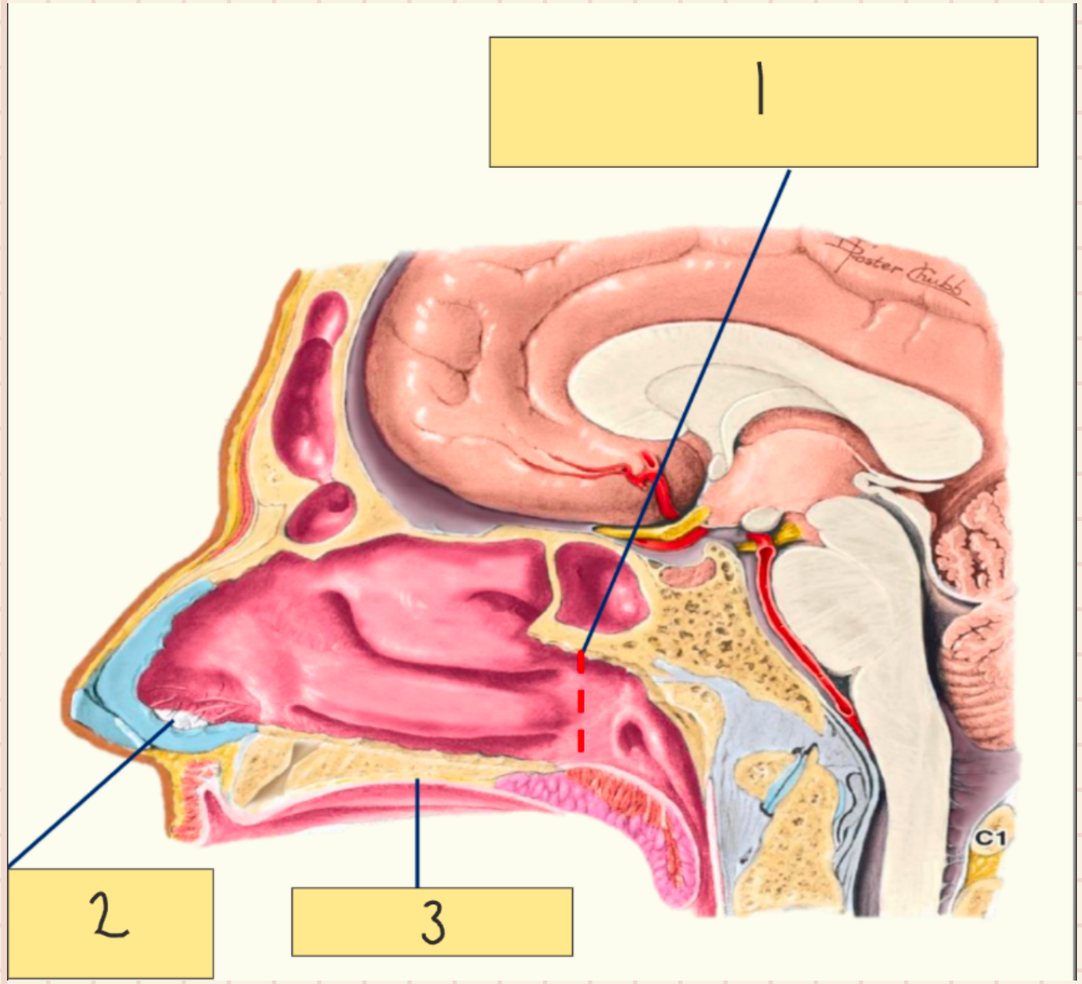




1. choanae/ posterior nasal apertures (lead into the nasopharynx)
2. nares/ anterior nasal apertures
3. hard palate

INTERNAL NASAL CAVITY, P2

- The nasal cavity is separated from the oral cavity below by the hard palate
- Hard palate is formed partly by your palatine bone + also by a portion of your maxilla
- Left and right nasal cavities are divided by the nasal septum
- Choanae are always open



WHAT ARE CHOANAE AKA?

A. Anterior nasal apertures

B. Posterior nasal apertures

C. Middle nasal apertures

D. Superior nasal apertures

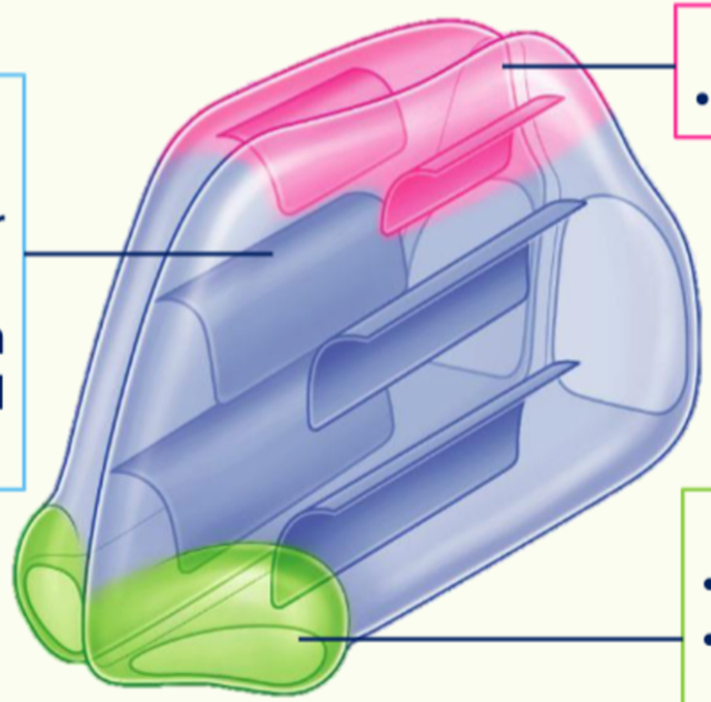
WHAT ARE CHOANAE AKA?

B. Posterior nasal apertures

Regions of Nasal Cavity

Respiratory

- Largest part of the nasal cavity
- Has a rich neurovascular supply
- Lined by respiratory epithelium composed mainly of ciliated and mucous cells



Olfactory

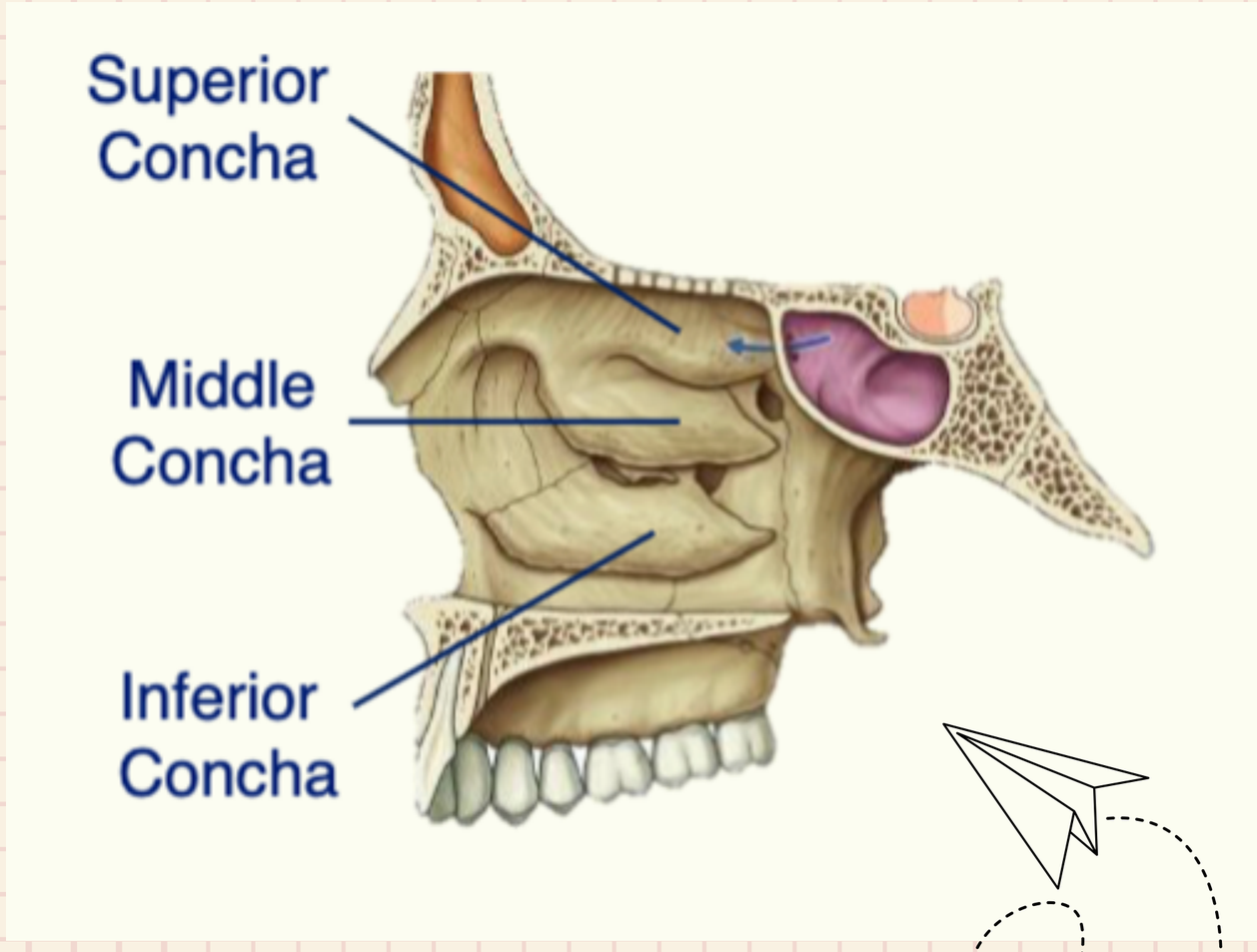
- Smallest part at the apex

Nasal Vestibule

- Just internal to the naris
- Lined by skin and covered in short hair follicles

LATERAL WALL: CONCHAE

- Conchae are AKA turbinates
- 3 curved shelves of bone creating 4 air channels which increase surface area for contact with inspired air
- Superior and middle concha are part of the ethmoid bone
- Inferior concha is an independent bone
- 3 concha in left nasal cavity and three on the right, found on the lateral wall

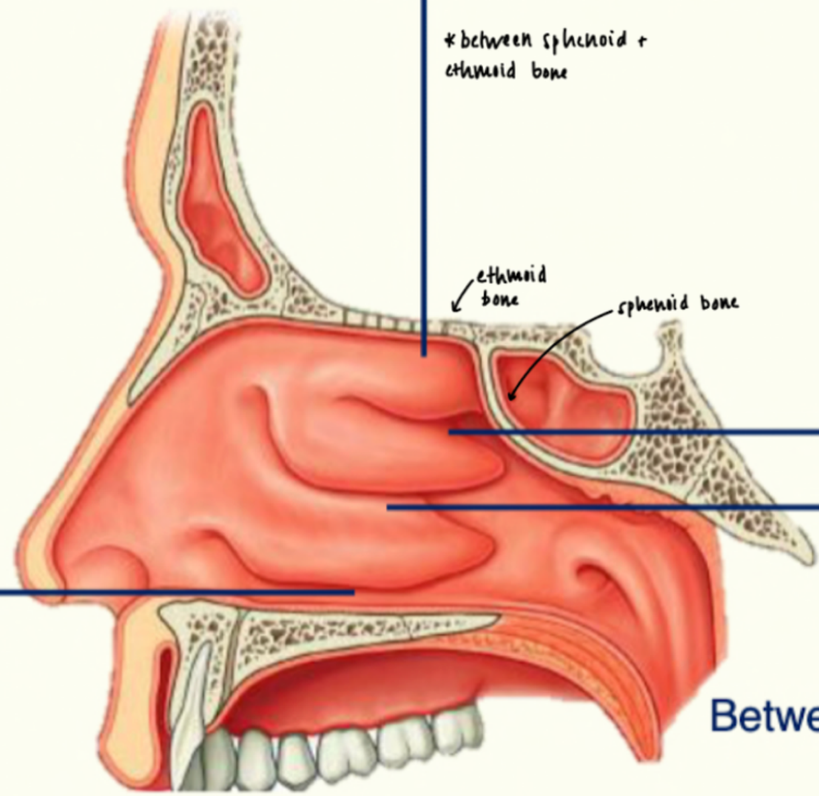


MEATUSES

Meatuses

Anterior end of concha curves medially to form a lip overlying the **meatus**

Spheno - ethmoidal recess
Between roof and superior concha

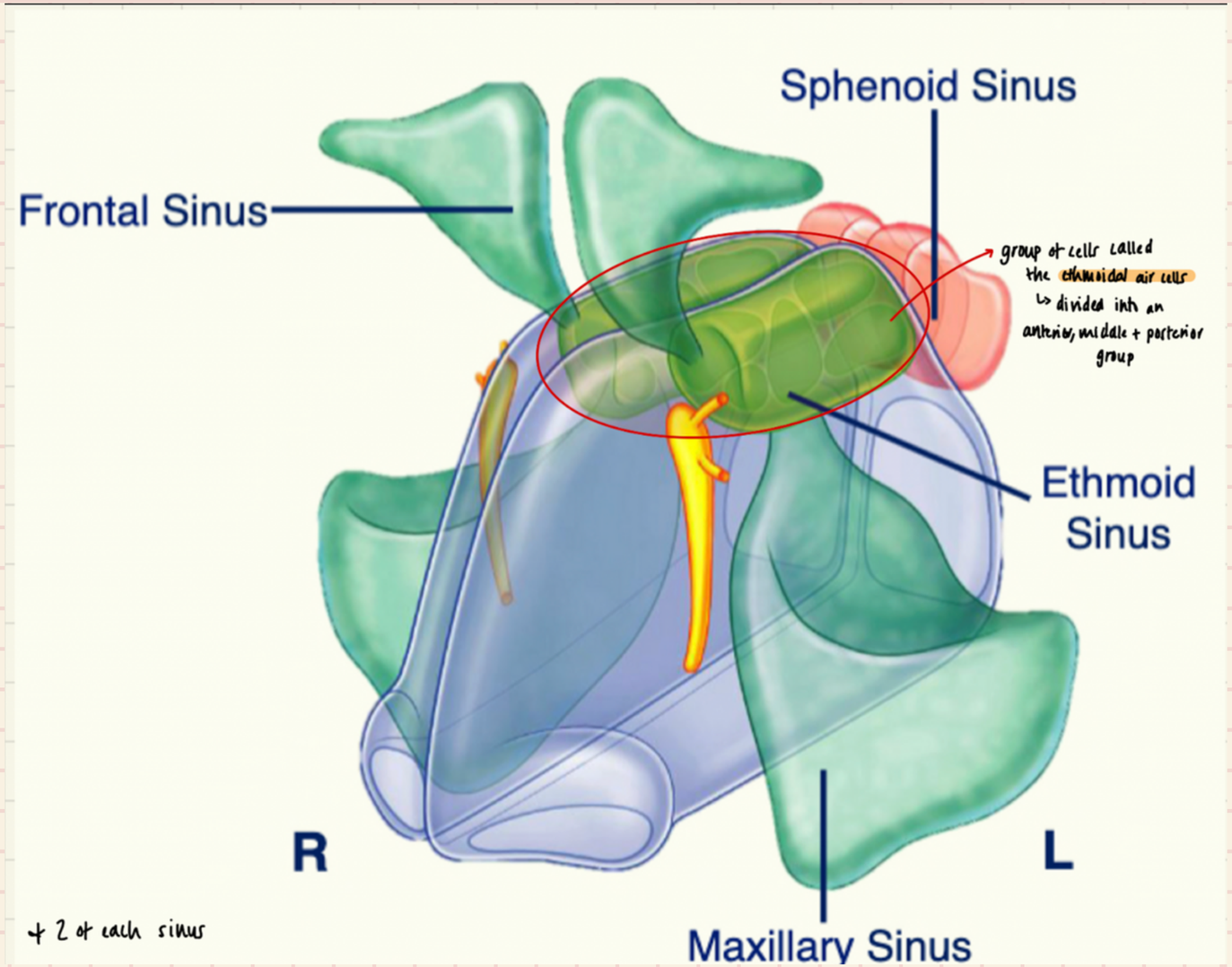


Superior Meatus
Between superior concha and middle concha

Inferior Meatus
Between inferior concha and floor

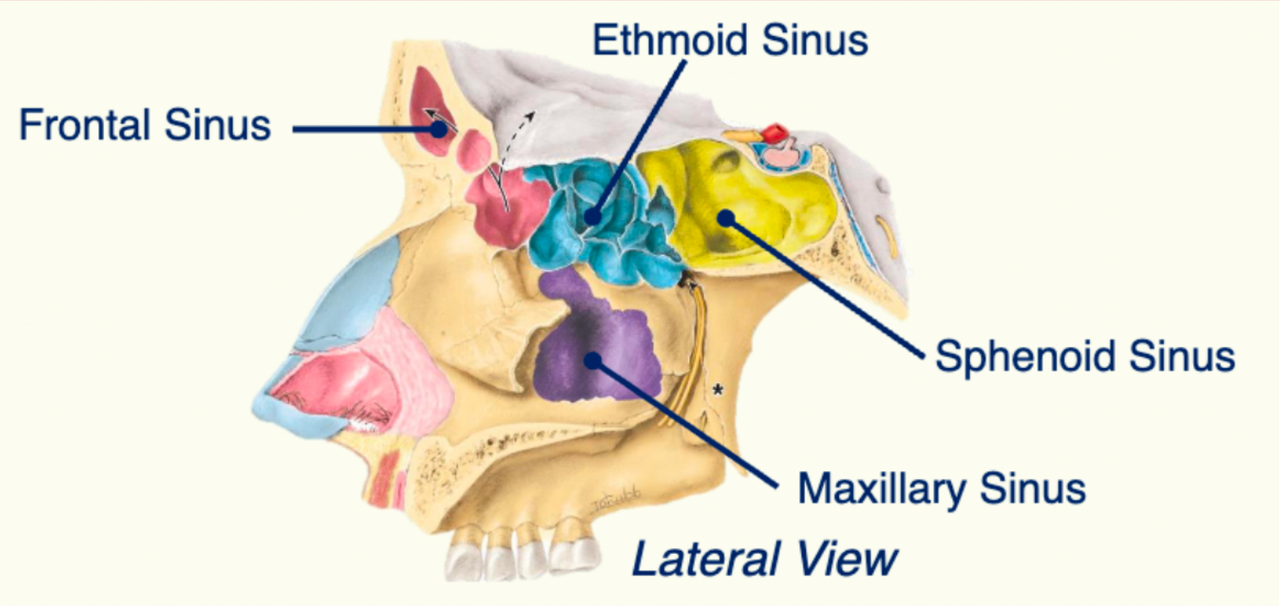
Middle Meatus
Between middle concha and inferior concha

PARANASAL SINUSES



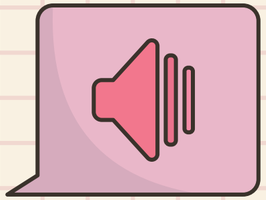
- Named in relation to the bone they are found within
- Develop as outgrowths from nasal cavities eroding into surrounding bone
- Lined by ciliated, mucous-secreting pseudo-stratified columnar epithelium/ AKA respiratory epithelium
- 4 functions, can you put them in the chat?

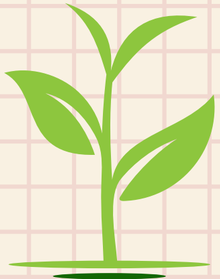
PARANASAL SINUSES



4 functions:

1. Resonate the voice
2. Lighten the skull
3. Shock absorption
4. Allow space for growth

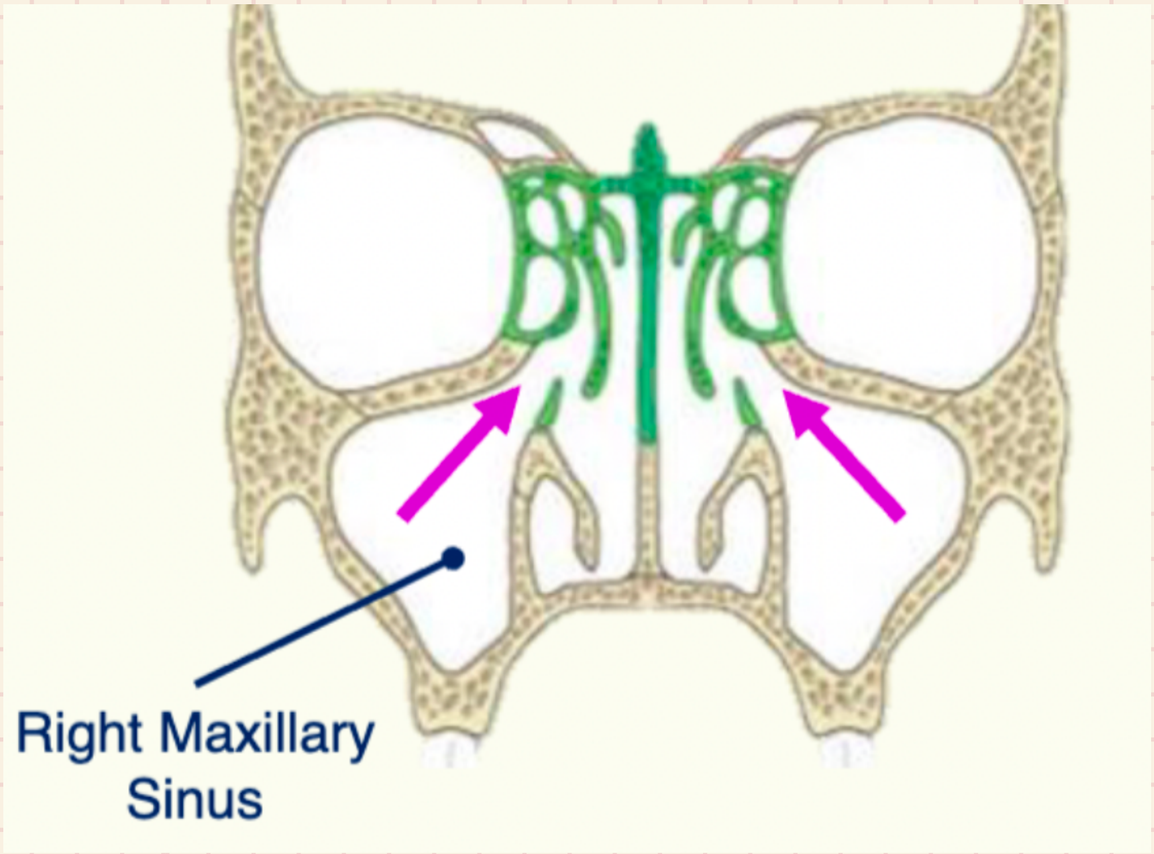




PARANASAL SINUSES

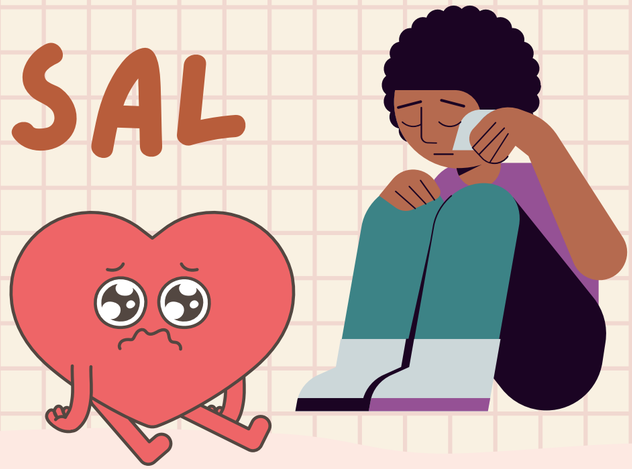
!!! Maxillary sinus is a frequent site of infection!!!

- as the ostium (opening of MS) lies at an obtuse angle, towards the roof of the sinus
- meaning that the secretions of the maxillary sinus do not drain well when you are stood up straight



purple arrow: direction of mucociliary clearance

DRAINAGE OF PARANASAL SINUSES!!!



SINUS	DRAINAGE
Frontal Sinus	Anterior end of semilunar hiatus
Ant. Ethmoidal Air Cells	Anterior end of semilunar hiatus
Mid. Ethmoidal Air Cells	Onto or just above the bulla ethmoidalis
Post Ethmoidal Air Cells	Lateral wall of superior meatus
Maxillary Sinus	Floor of semilunar hiatus
Sphenoid Sinus	Spheno-ethmoidal recess
Nasolacrimal Duct	Lateral wall of inferior meatus

Nasolacrimal duct is the reason your nose runs whilst crying as that lacrimal fluid makes its way from the orbit inferiorly towards the nasal cavity

“Crying is an inferior feeling”
creds to Ruhaan, Y3

WHAT TYPE OF CELL ARE THE PARANASAL SINUSES AND RESPIRATORY REGION OF THE NASAL CAVITY LINED WITH????

A. Non keratinising ciliated mucosa

B. Ciliated pseudostratified columnar epithelium

C. Ciliated keratinising squamous epithelium

D. Urothelium

WHAT TYPE OF CELL ARE THE PARANASAL SINUSES AND RESPIRATORY REGION OF THE NASAL CAVITY LINED WITH????

B. Ciliated pseudostratified columnar epithelium

WHICH PARANASAL SINUS DRAINS TO THE HIATUS SEMILUNARIS?

A. Maxillary

B. Bulla Ethmoidalis

C. Frontal

D. Nasolacrimal

A. Maxillary

WHICH PARANASAL SINUS DRAINS TO THE HIATUS SEMILUNARIS?

WHICH BONE ARE THE SUPERIOR AND MIDDLE CONCHAE DERIVED FROM?

A. Maxillary

B. Mandible

C. Ethmoid bone

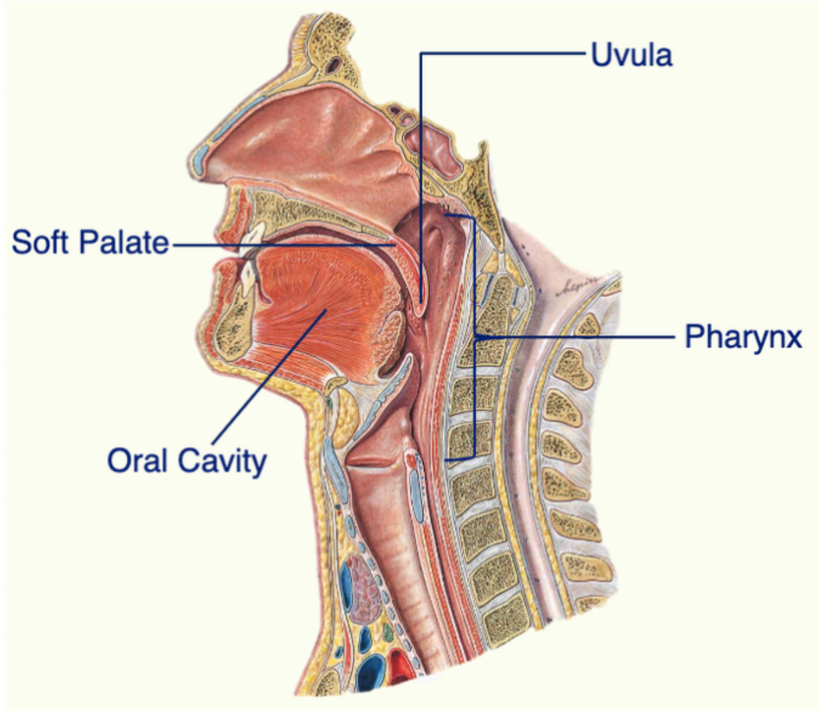
D. Sphenopalatine

WHICH BONE ARE THE SUPERIOR AND MIDDLE CONCHAE DERIVED FROM?

C. Ethmoid bone

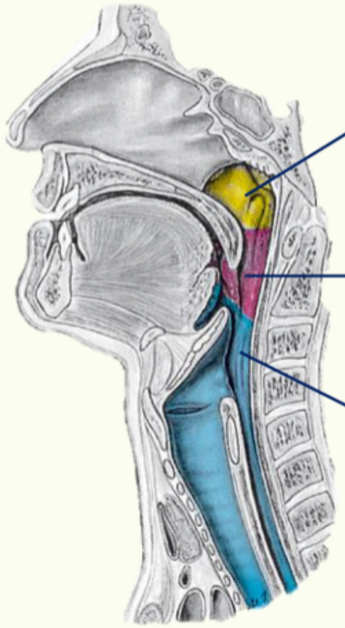
THE PHARYNX

- The pharynx is a musculofascial half-cylinder
- It extends between skull base and vertebral level C6
- Connects nasal and oral cavities to larynx and oesophagus
- Common passage for air and food
- Stops at the level of oesophagus → approx C6
- The soft palate dangles off the end of the hard palate, which divides the nasal and oral cavities and hanging off in the midline
- The uvula can elevate upwards during swallowing to close the close off different regions of the pharynx



THE PHARYNX DIVISIONS

Pharynx Divisions



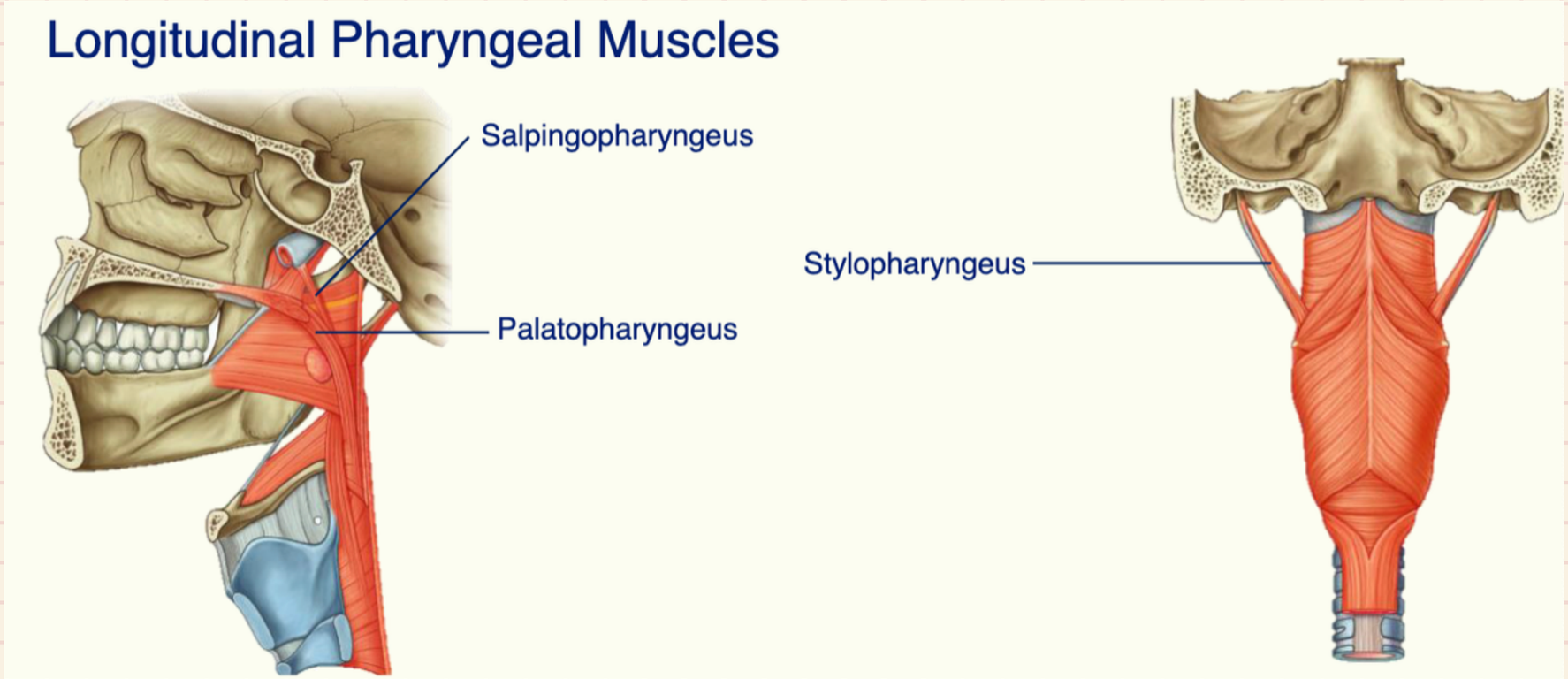
Nasopharynx
- Posterior to choanae
- Continuous with oropharynx at pharyngeal isthmus

Oropharynx
- Posterior to, and divided from oral cavity by oropharyngeal isthmus

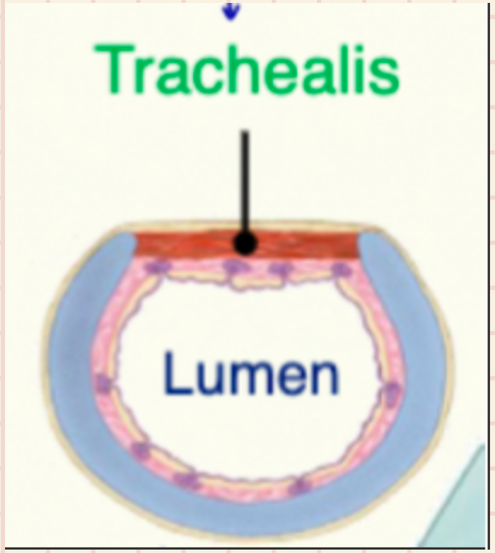
Laryngopharynx
- Posterior to laryngeal inlet

The eustachian/pharyngotympanic tube connects the nasopharynx to the middle ear cavity!

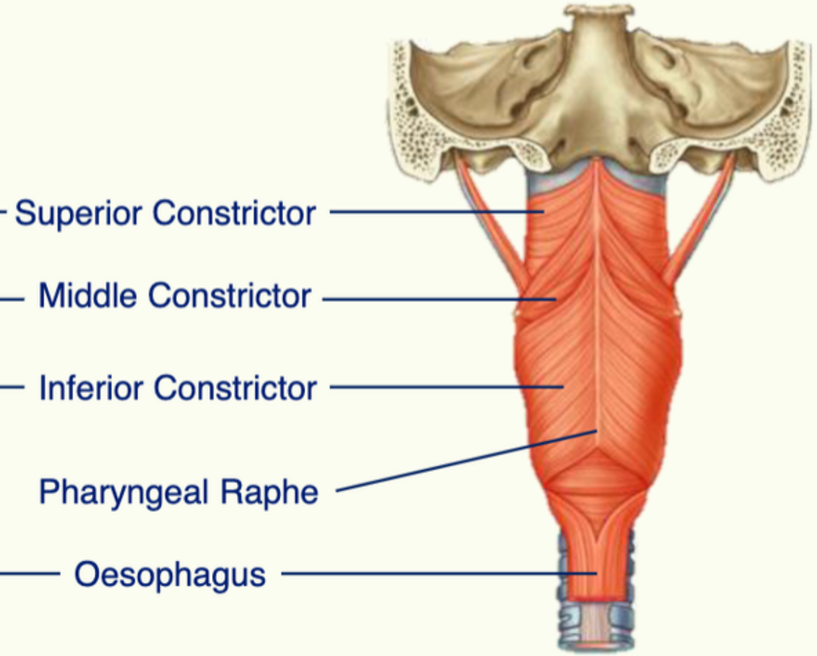
It equalises pressure when you change altitude



- These also push a food bolus down ur throat into your oesophagus but they do this by shortening behind the bolus and lengthening in front of it
- <u>Salpingopharyngeus is what opens the eustachian tube to equalise middle ear pressure</u>
- TRACHIALIS MUSCLE: the trachea rings aren't full circles. They attach to the trachealis muscle by an elastic ligamentous membrane



THE PHARYNX: CIRCULAR MUSCLES



- These constrictors pass posteriorly on either side of the midline to unite centrally at a cord-like structure formed by connective tissue, which is called the **pharyngeal raphe**
- As they are stacked like ‘plant pots’ the fibres of the middle constrictor, the overlap, the superior constrictor and so on
- These circular muscles contract sequentially to propel the bolus of food inferiorly towards the oesophagus

- The **superior** constrictor attaches in a line between the **mandible** and the **base** of the skull
- The **middle** constrictor attaches to the **hyoid** bone
- The **inferior** constrictor attaches to the **thyroid** cartilage

WHICH PHARYNGEAL MUSCLE OPENS THE PHARYNGEAL ORIFICE OF THE EUSTACHIAN TUBE WHEN SWALLOWING?

A. Trachealis

B. Salpingopharyngeus

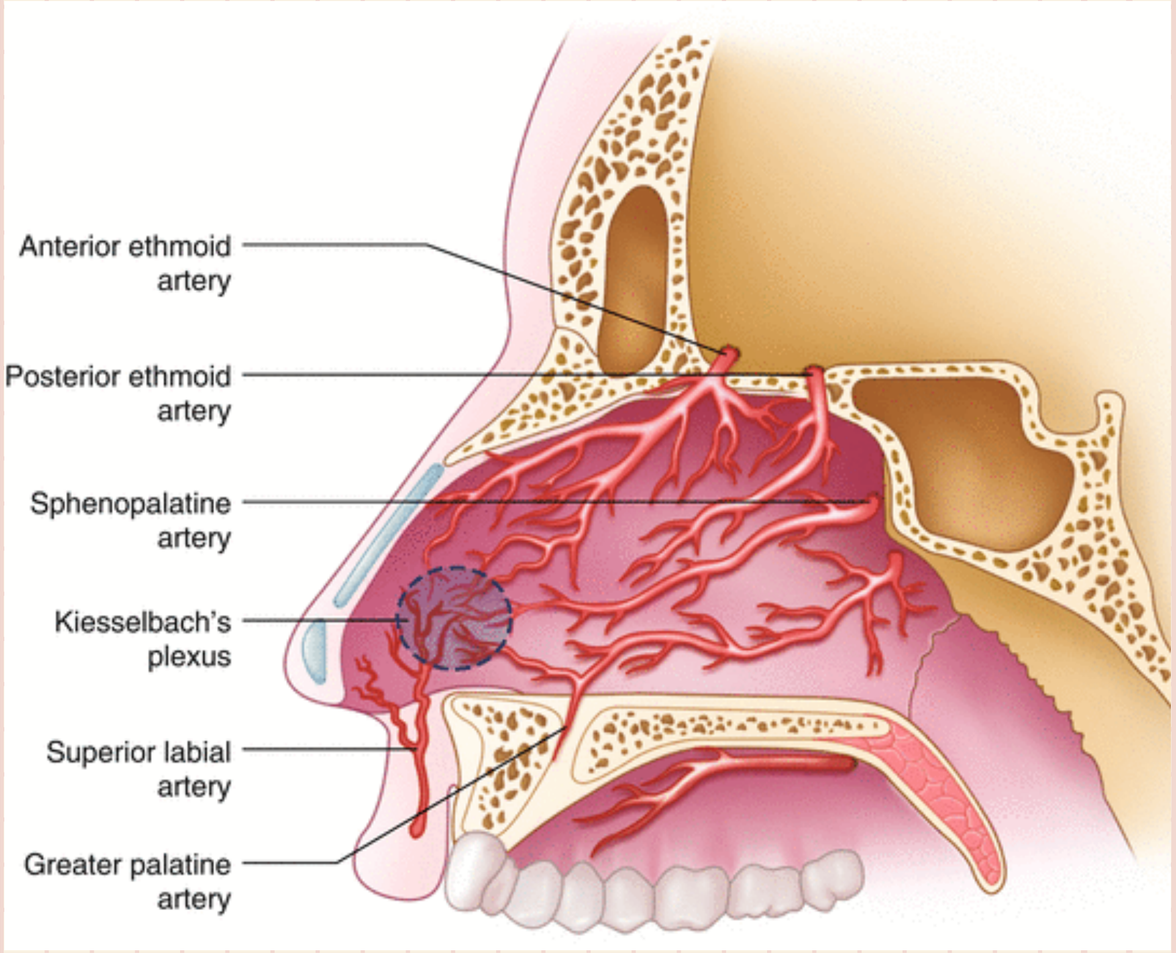
C. Palatopharyngeus

D. Stylopharyngeus

WHICH PHARYNGEAL MUSCLE OPENS THE PHARYNGEAL ORIFICE OF THE EUSTACHIAN TUBE WHEN SWALLOWING?

B. Salpingopharyngeus

LITTLE'S AREA/ KIESSELBACH'S PLEXUS



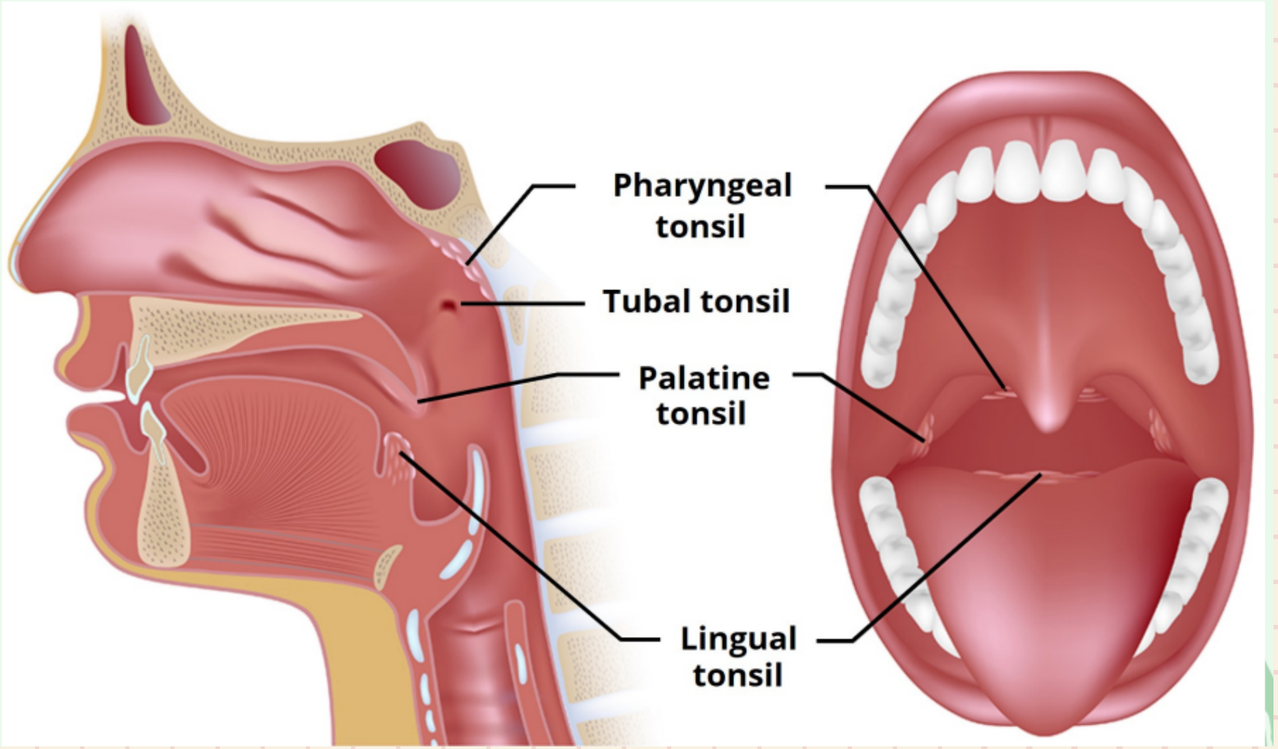
important site of extensive anastomosis on nasal septum

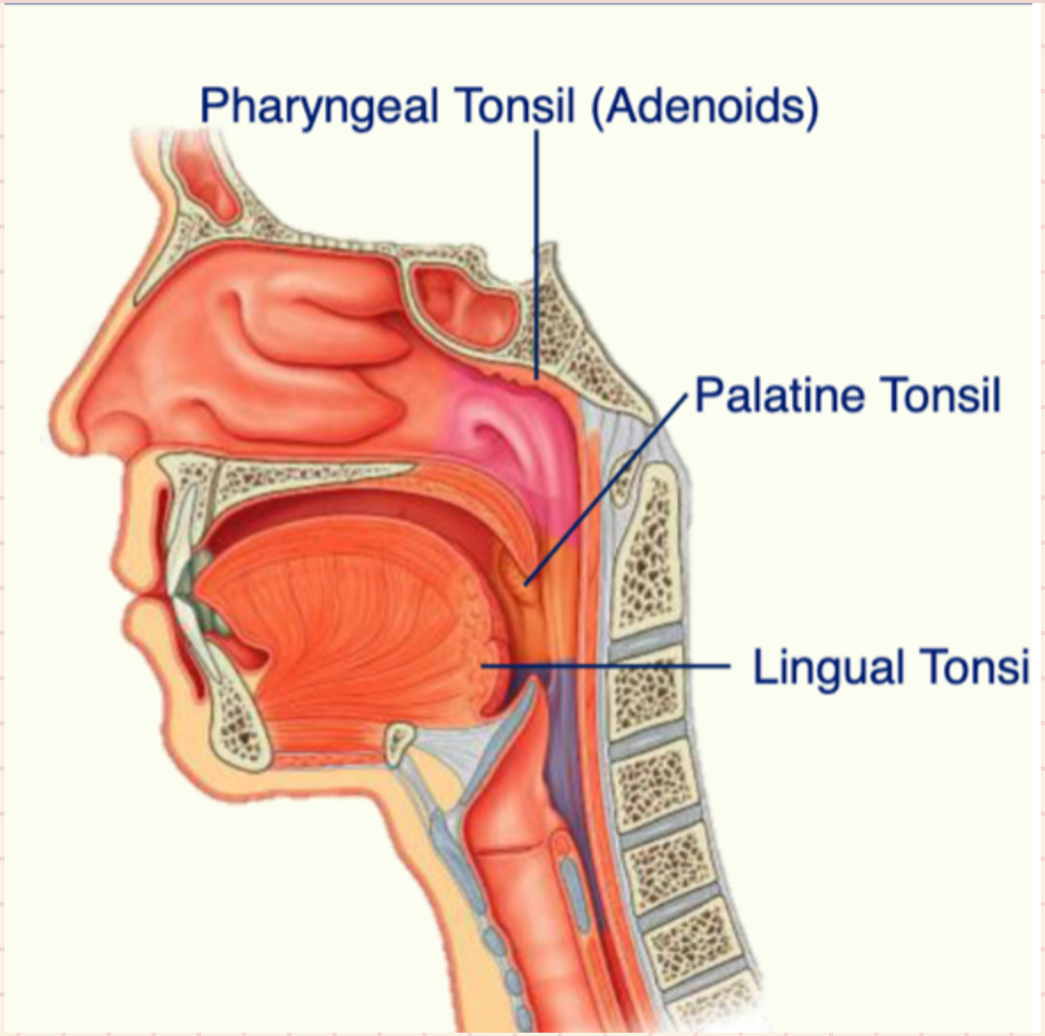
GASS acronym

1. **Greater Palatine Artery**
2. **Anterior Ethmoidal Artery**
3. **Sphenopalatine Artery (septal branches)**
4. **Superior Labial Artery (septal branches)**

- This is clinically relevant because of epistaxis (a nosebleed) rupture of arterioles in the little's area leads to nose bleed
- Quite easy to manage just by compressing structures called the ala onto the septum here by compression and trying to stop the bleed
- In older people, might indicate a spike in blood pressure (hypertension) harder to manage and bleeds in the posterior and superior parts of the nasal cavity

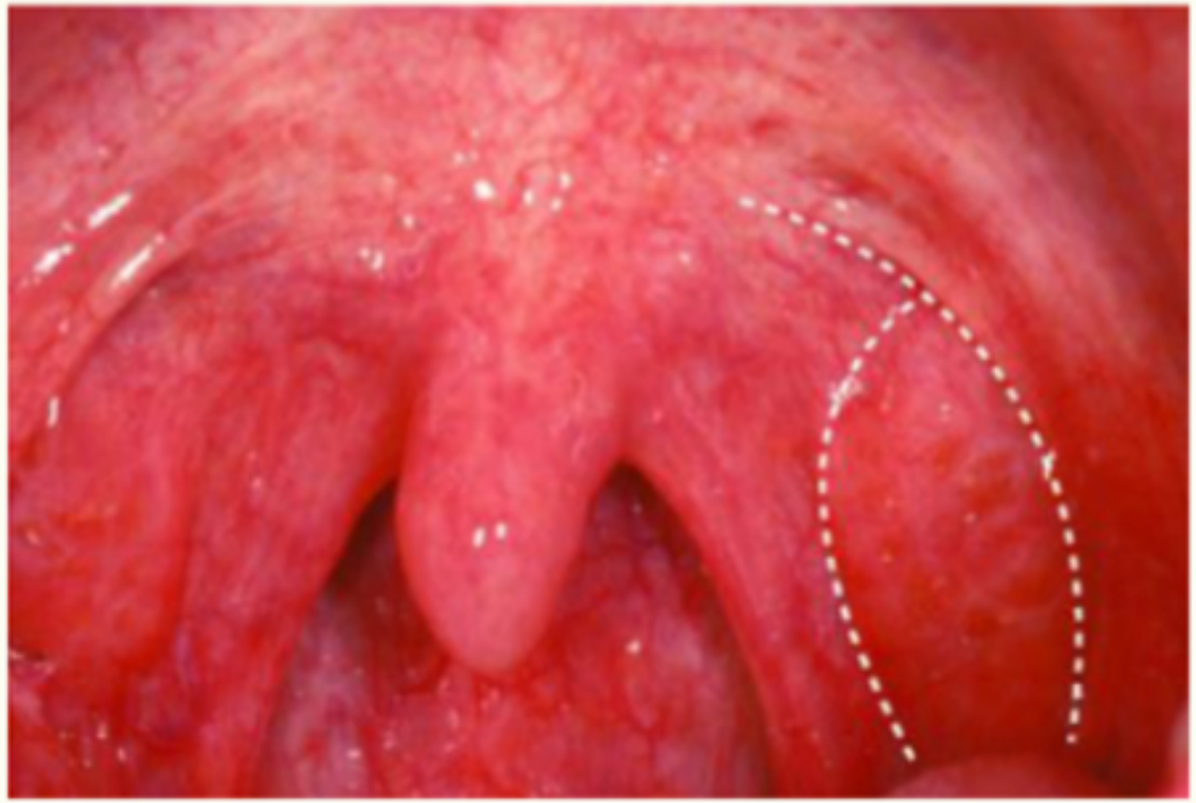
TONSILS



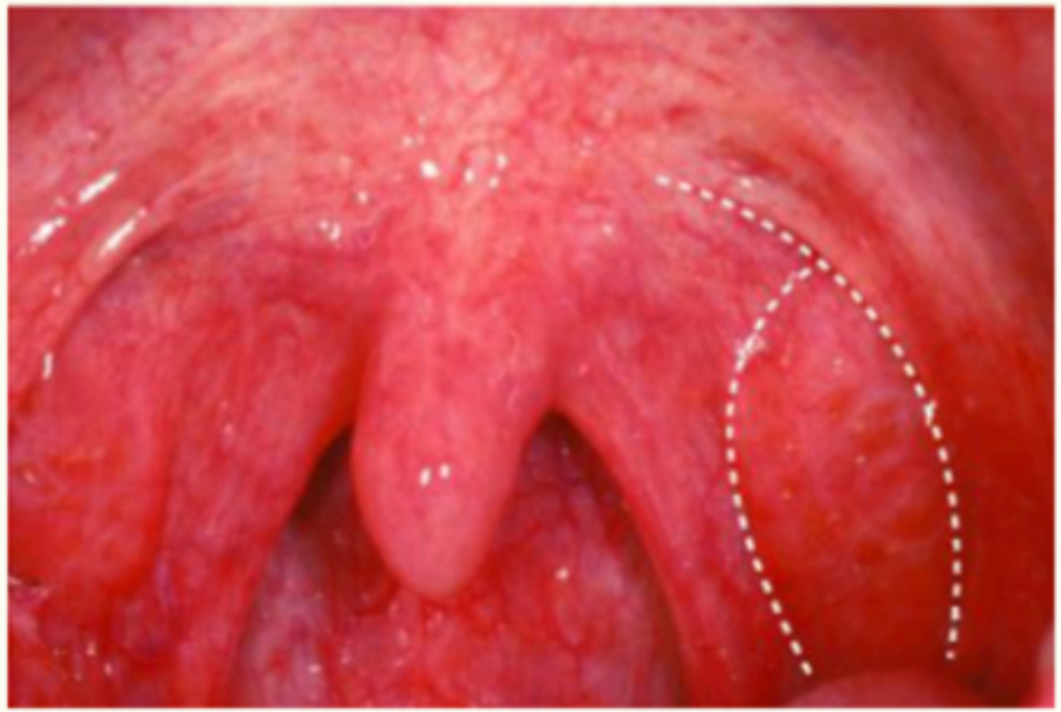


- Tonsils are 3 pairs of **bilateral lymphoid** tissue that surround the oral cavity
- They act as a **defence** system against infections for the upper resp tract
- **Palatine** tonsils associated with **tonsilitis**

WHAT IS THIS?



WALDEYER'S RING



- Yellow ring in tonsil picture is called the **Waldeyer's ring**
- And at the back of the nasal cavities and also the oral cavities and are a line of defence
- The **Waldeyer's** ring is a collection of **lymphoid** tissue in the pharynx
- The lymphoid tissue functions for **immune defence in the upper respiratory tract**

WHAT DIVIDES THE NASOPHARYNX FROM THE OROPHARYNX?

A. Little’s area

B. Pharyngeal isthmus

C. Hard palate

D. Waldeyer’s ring

WHAT DIVIDES THE NASOPHARYNX FROM THE OROPHARYNX?

B. Pharyngeal isthmus

WHICH ONE OF THESE ARTERIES ARE NOT PART OF THE KIESSELBACH'S PLEXUS?

A. Greater Palatine Artery

B. Anterior Ethmoidal Artery

C. Superior Labial Artery

D. Spheno-ethmoidal Artery

WHICH ONE OF THESE ARTERIES ARE NOT PART OF THE KIESSELBACH'S PLEXUS?

It is Sphenopalatine!!!

D. Spheno-ethmoidal Artery