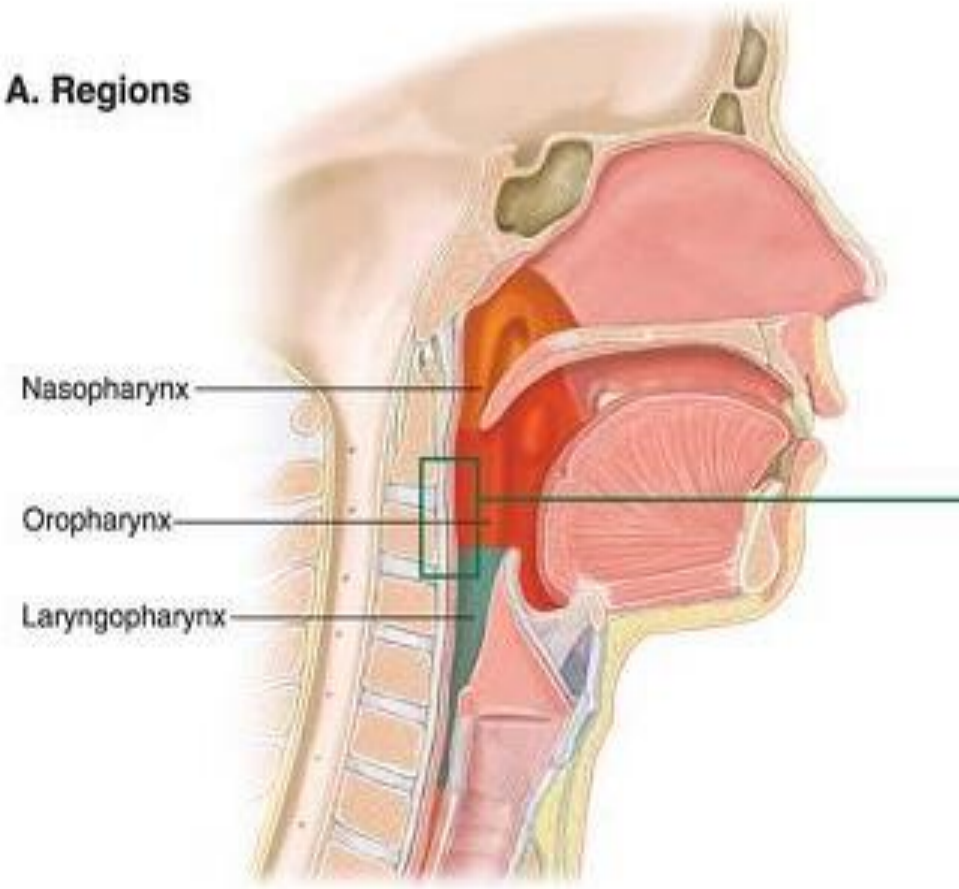
Pharynx

NotesMed.com

- **Funnel-shaped fibromuscular** tube lined by mucous membrane
- Extent- base of the skull to C6 vertebra
- Location :

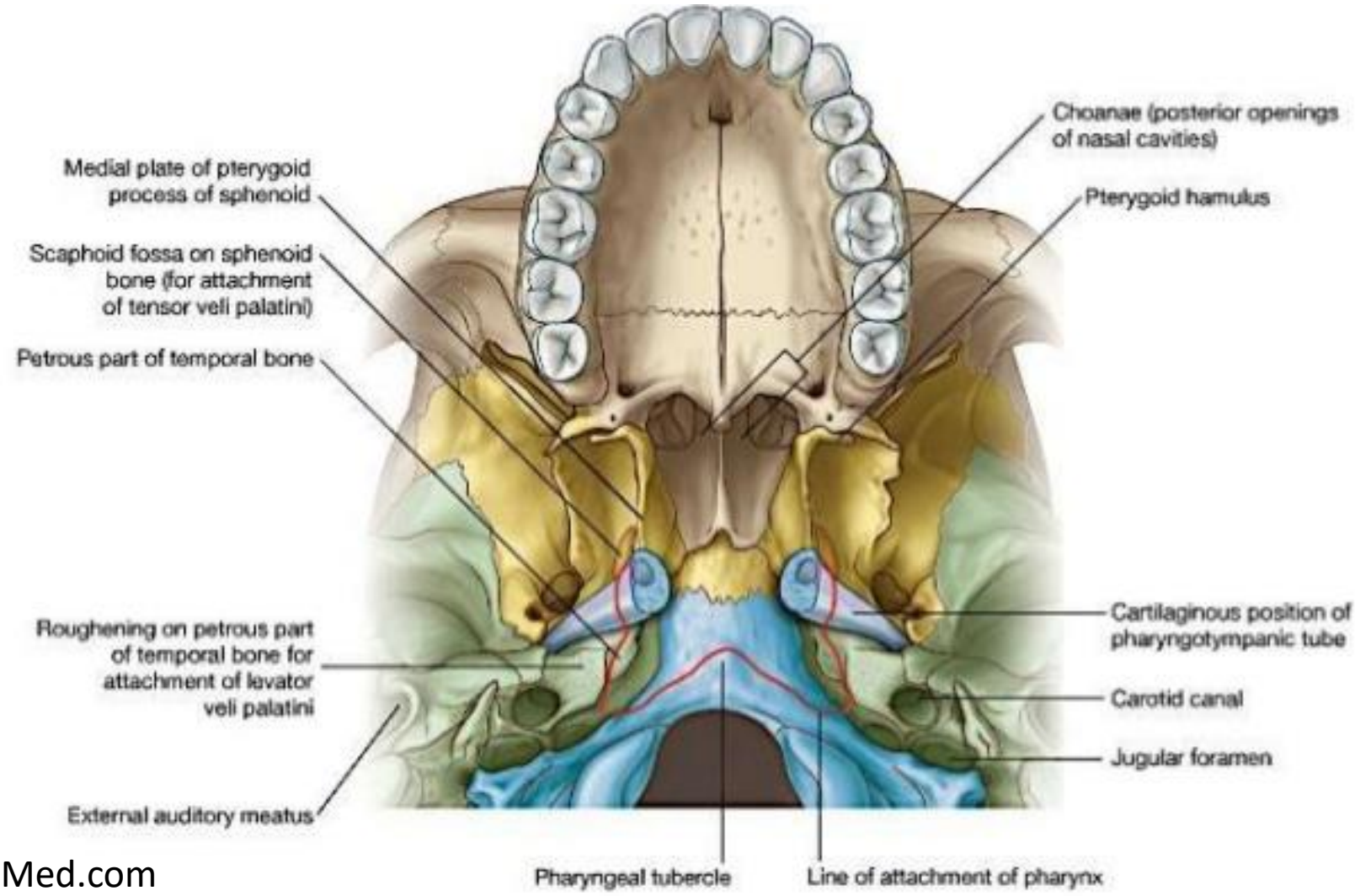
Behind

  - The Nose- Nasopharynx
  - The Mouth -oropharynx
  - The Larynx-laryngopharynx



Boundaries

- **Roof** :- body of sphenoid and basilar part of the occipital bone.



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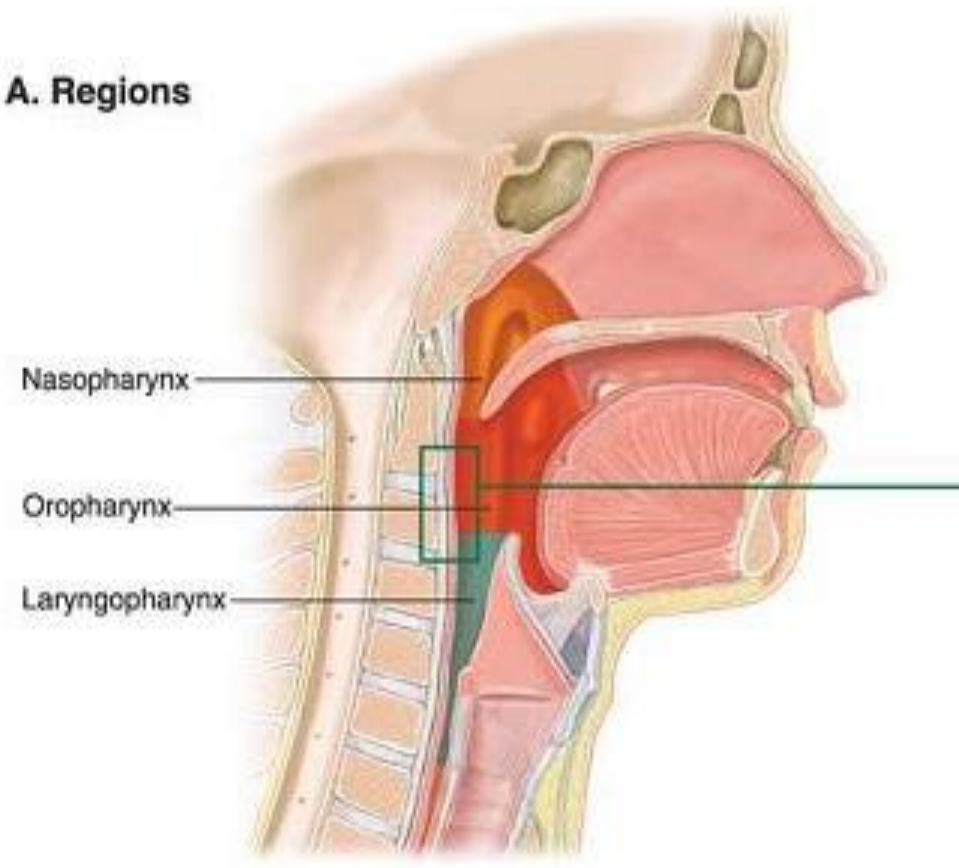
- **Inferiorly:**
  - continuous with oesophagus opposite the sixth cervical vertebra.

- **Posteriorly:**
  - supported by upper six cervical vertebra, prevertebral muscles and fascia.

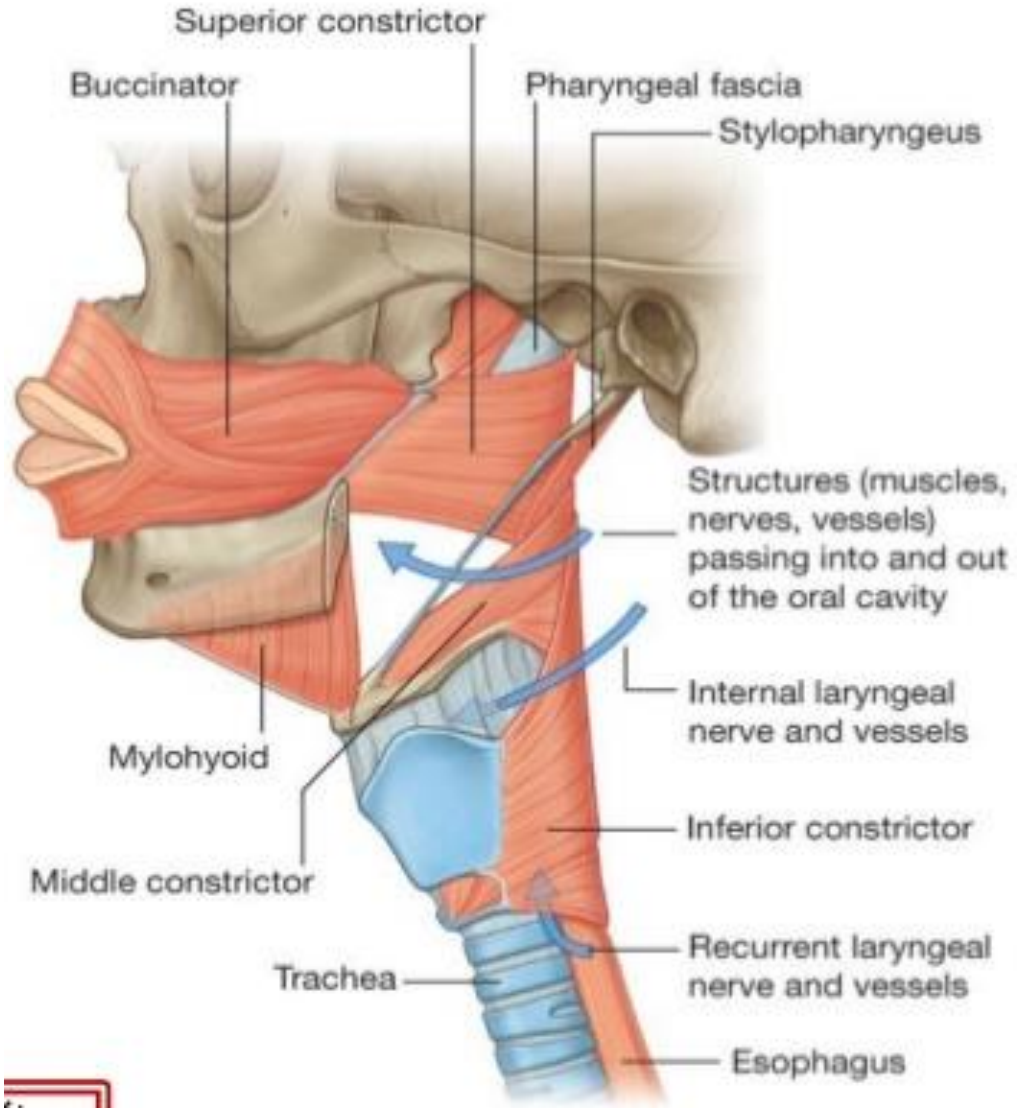
- **Anteriorly:**
  - communicate with oral cavity, nasal cavity and larynx.



On each side :

Attached to:-

- Medial pterygoid plate.
- Pterygomandibular raphe mandible.
- Tongue.
- Hyoid bone.
- Thyroid and cricoid cartilage.

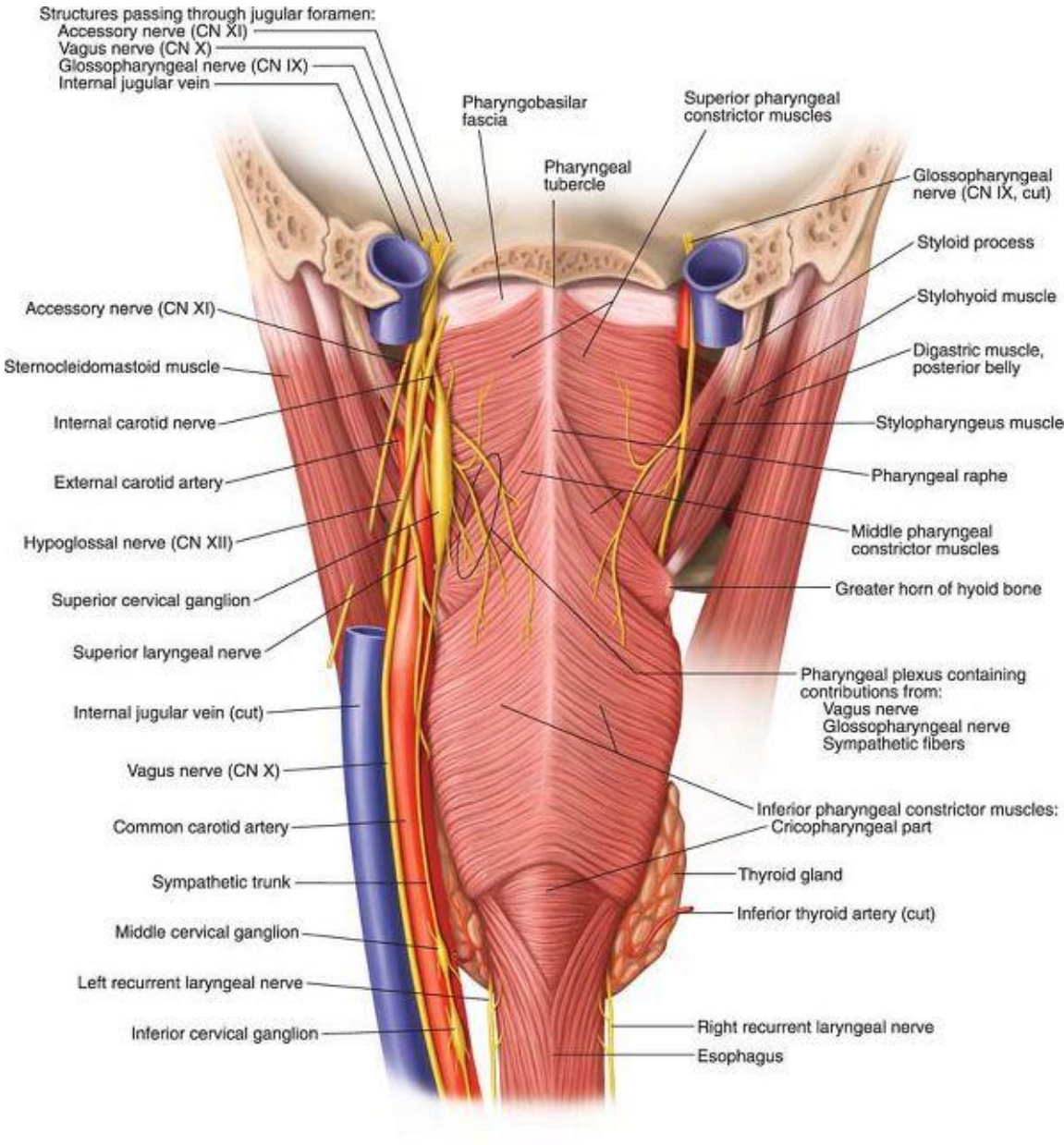


A. Related to:-

styloid process, common carotid artery, external and internal carotid arteries.

B. Communicate with:-

middle ear cavity with auditory tube



Sub divisions

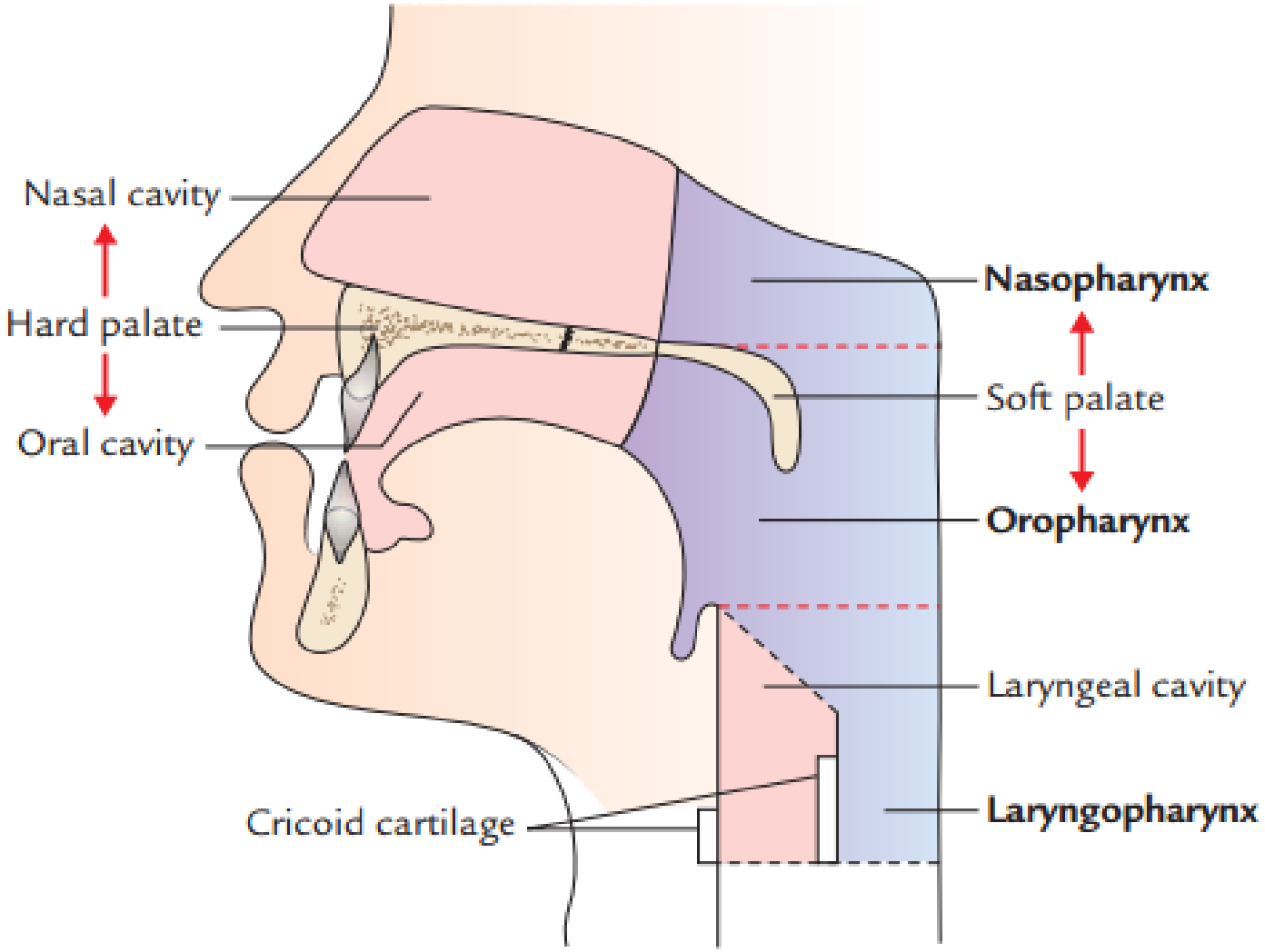
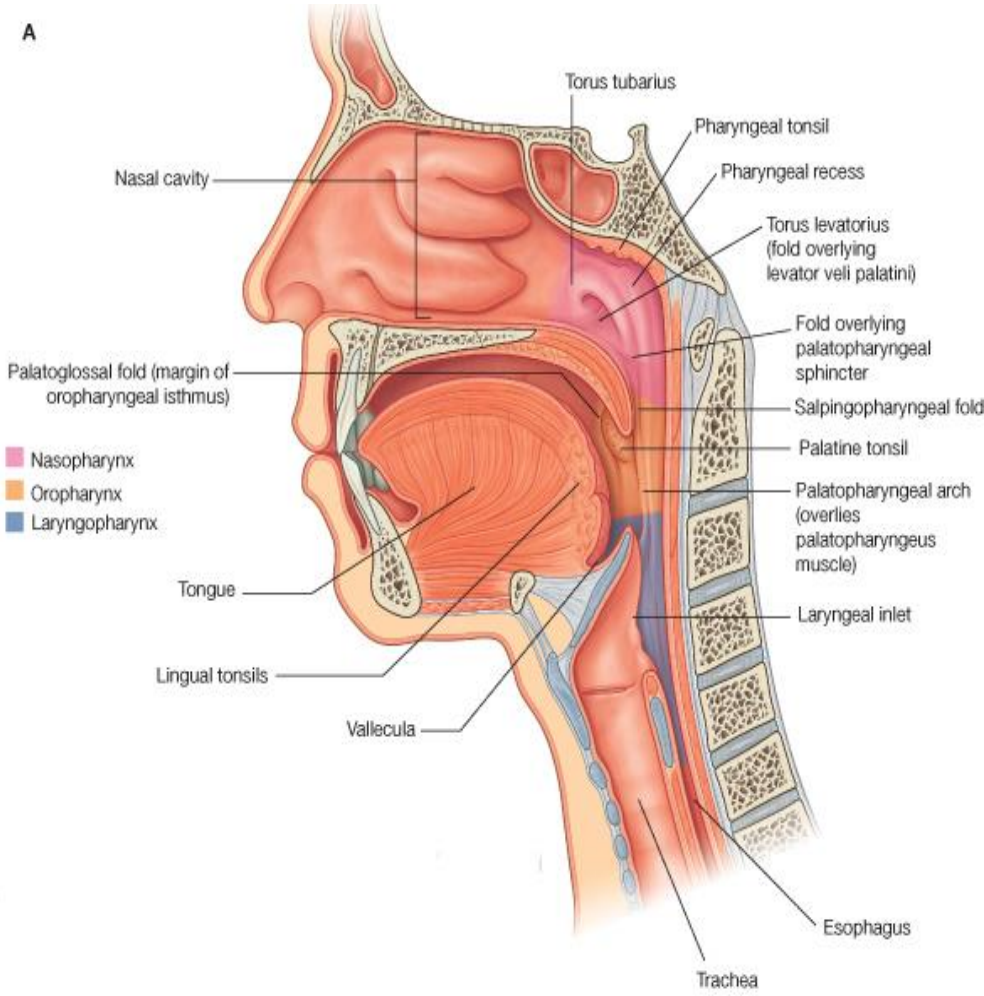


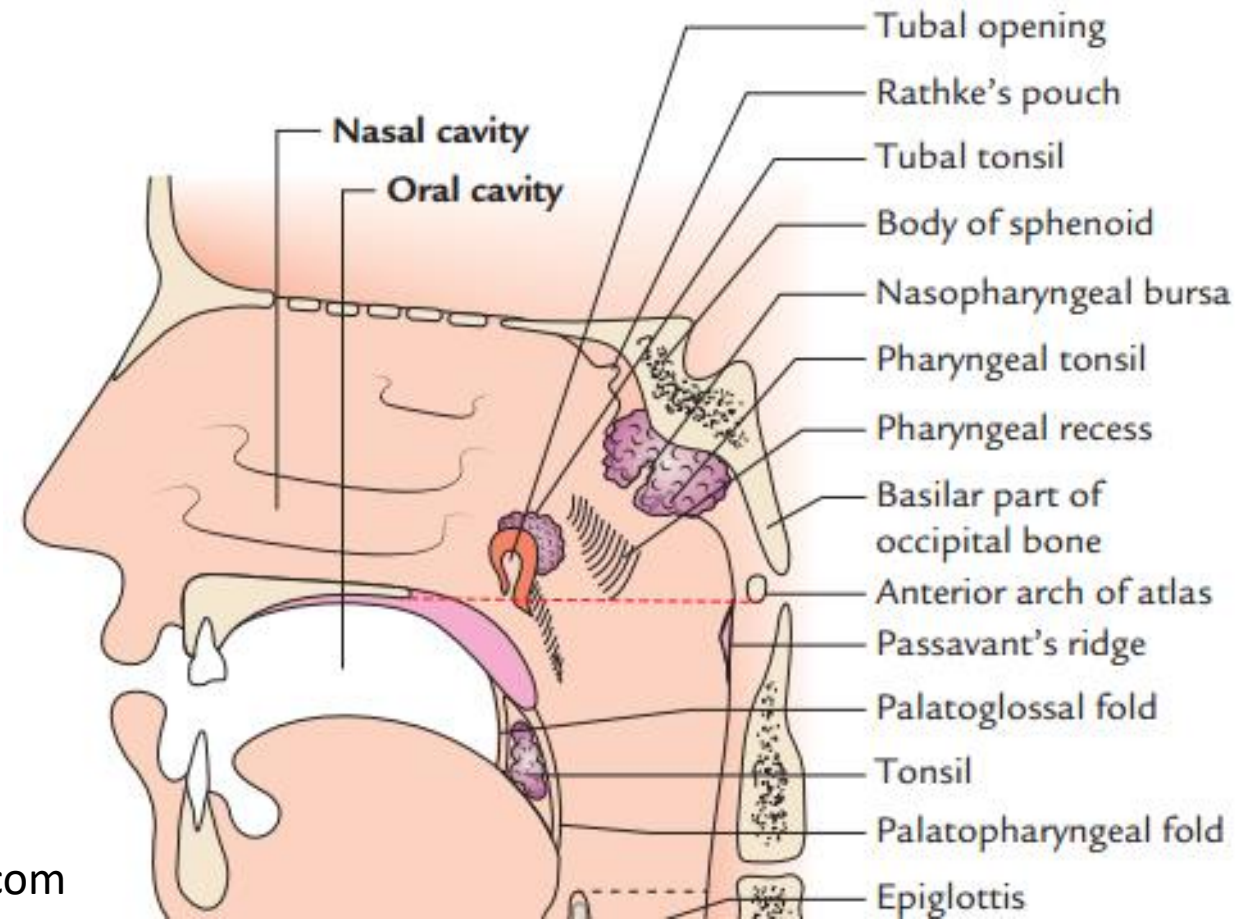
Fig. 14.3 Subdivisions of the pharynx.

Nasopharynx

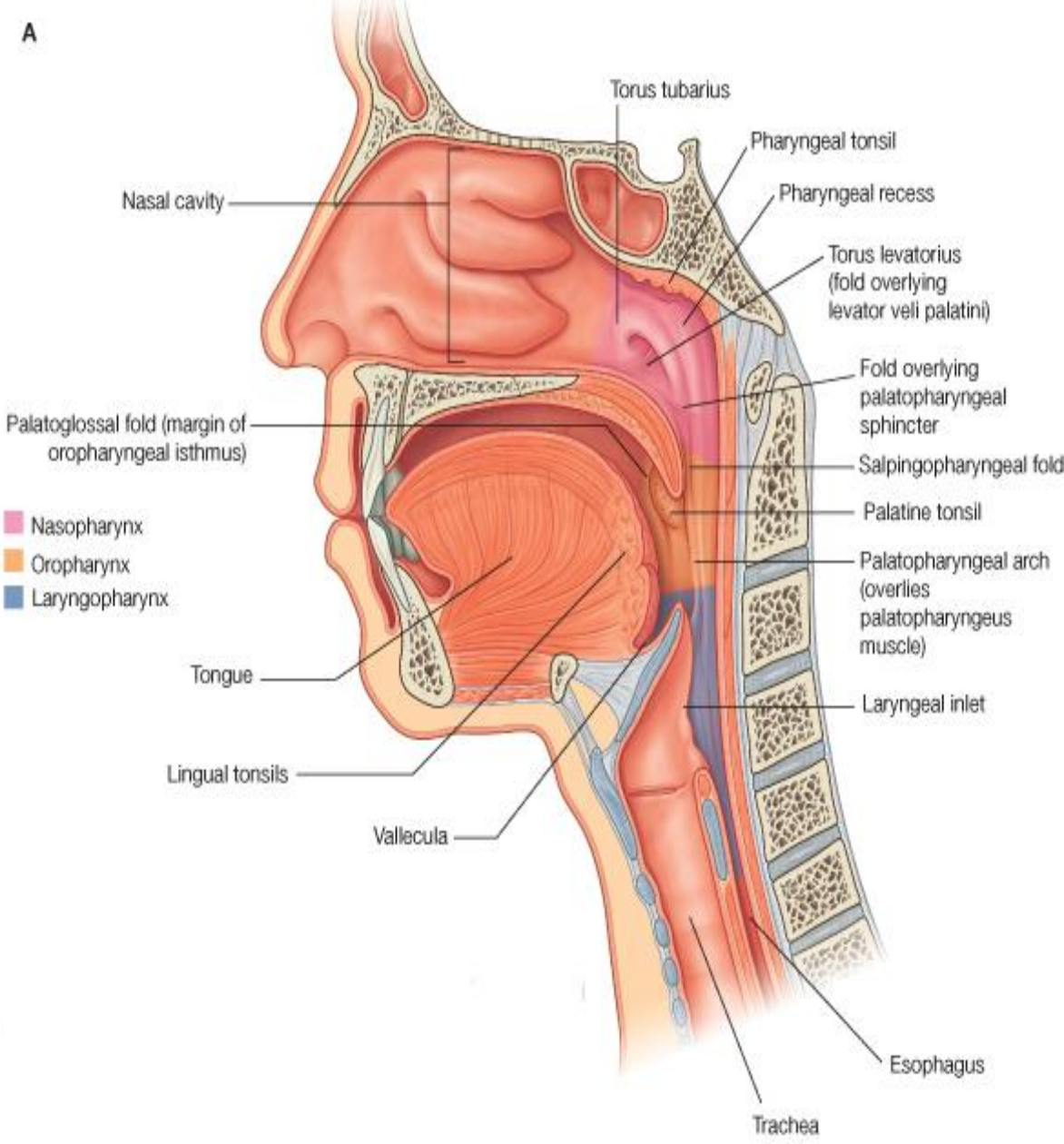
- Behind the nasal cavity.
- **Extends:** from base of skull superiorly to the soft palate inferiorly.
- **Anteriorly:** communicates with nasal cavity.



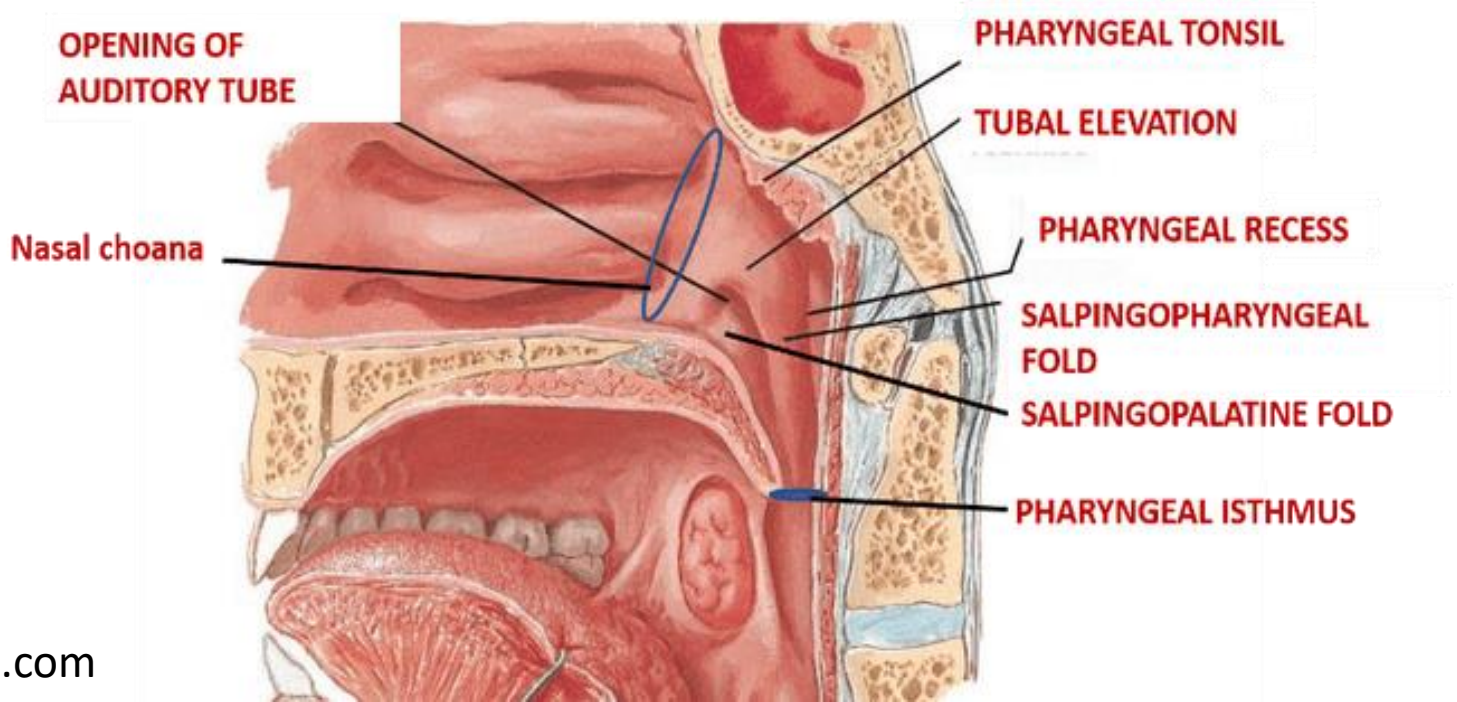
- **Roof and posterior wall** form a continuous surface and presents:
  - **Pharyngeal or nasopharyngeal tonsil:**
  - Enlarged tonsil is known as **adenoid**
  - **Pharyngeal bursa**



- **Lateral wall :**
  - Pharyngeal opening of **auditory tube** about 1.25 cm behind and slightly below the level of inferior nasal concha.
  - **Tubal elevation-**
  - guards the upper and posterior margin of the auditory tube
  - Overlies the tubal tonsil



- Two mucous folds passes downward i.e.
  - **Salpingopharngeal fold**
  - **Salpingopalatine fold** (formed by the L. veli palatini muscle)
- **Pharyngeal recess (fossa of Rosenmuller):** mucous covered deep depression behind the tubal elevation



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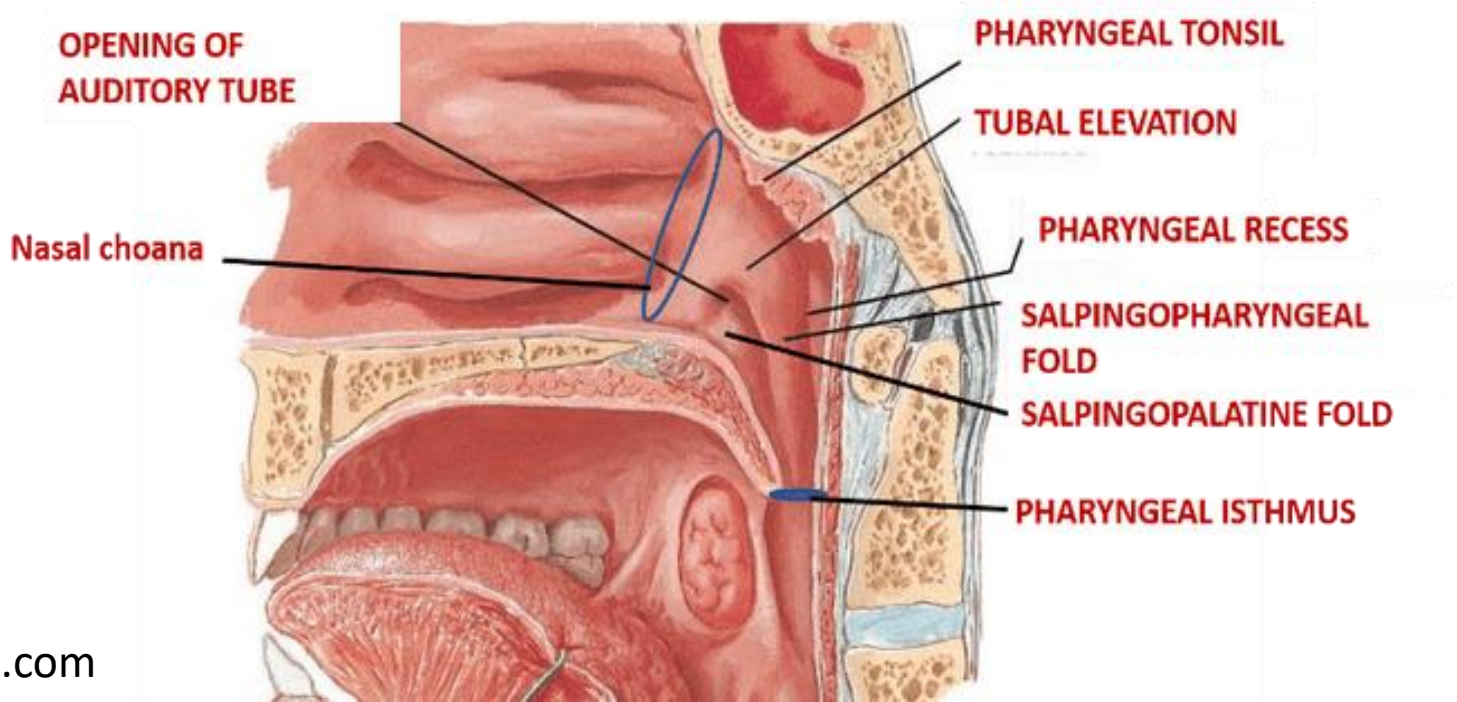
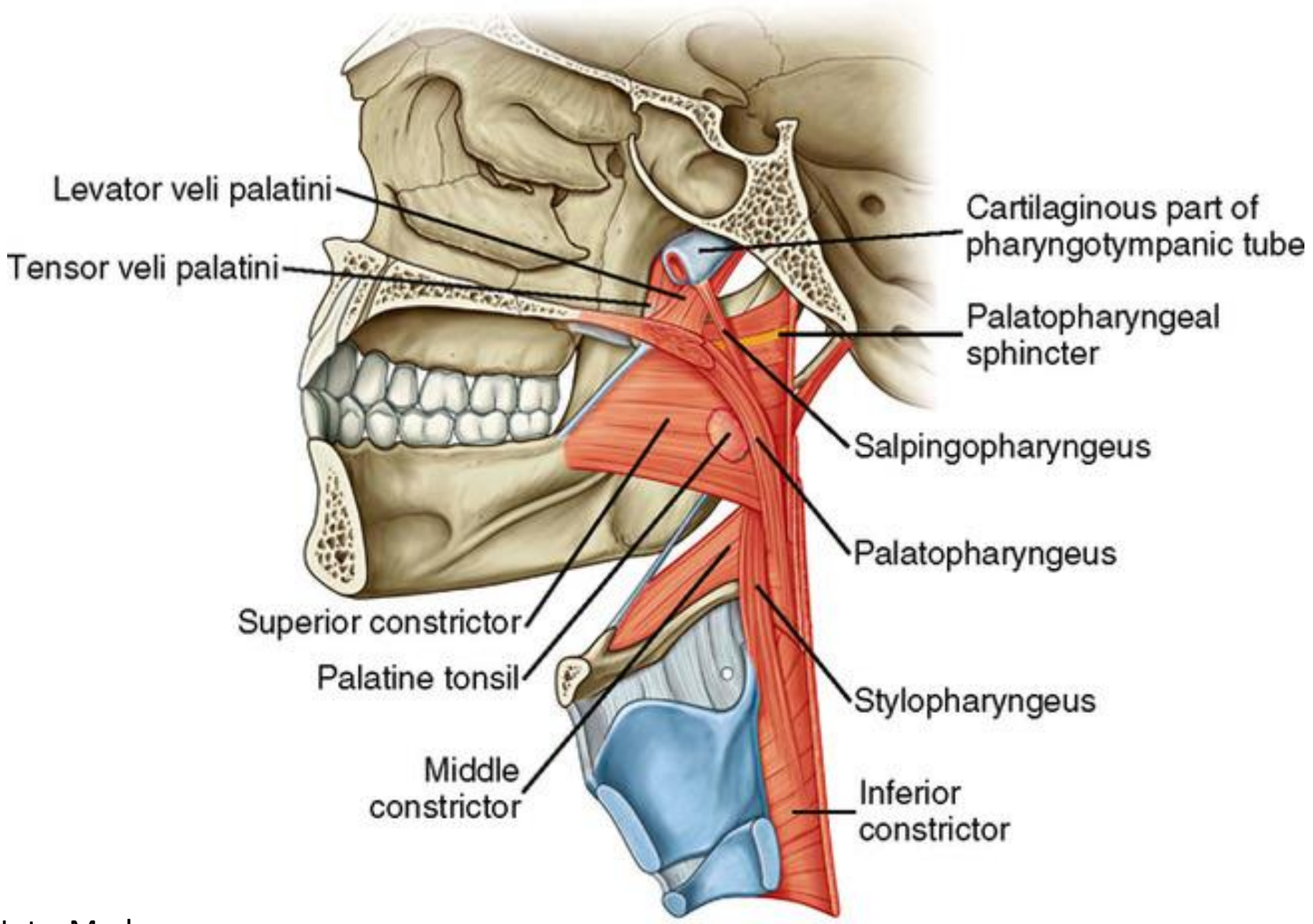
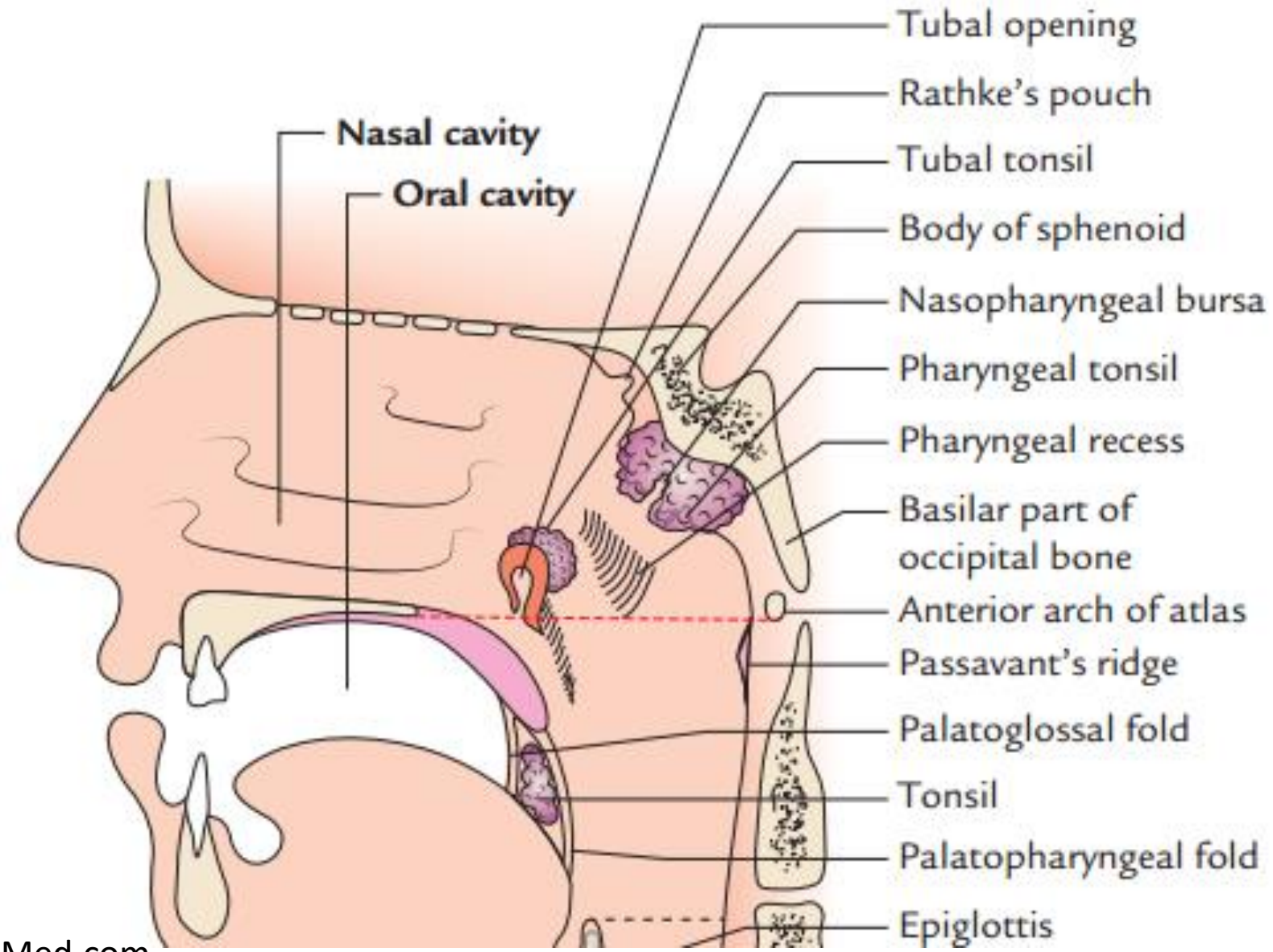
- **Floor** : communicate with oropharynx through **pharyngeal isthmus.**
- **Boundaries**
  - Anterior: posterior surface of free margin of soft palate.
  - Posterior: Mucous elevation formed by palatopharyngeal sphincter (**passavant's ridge).**
  - On each side: palatopharyngeal arch.



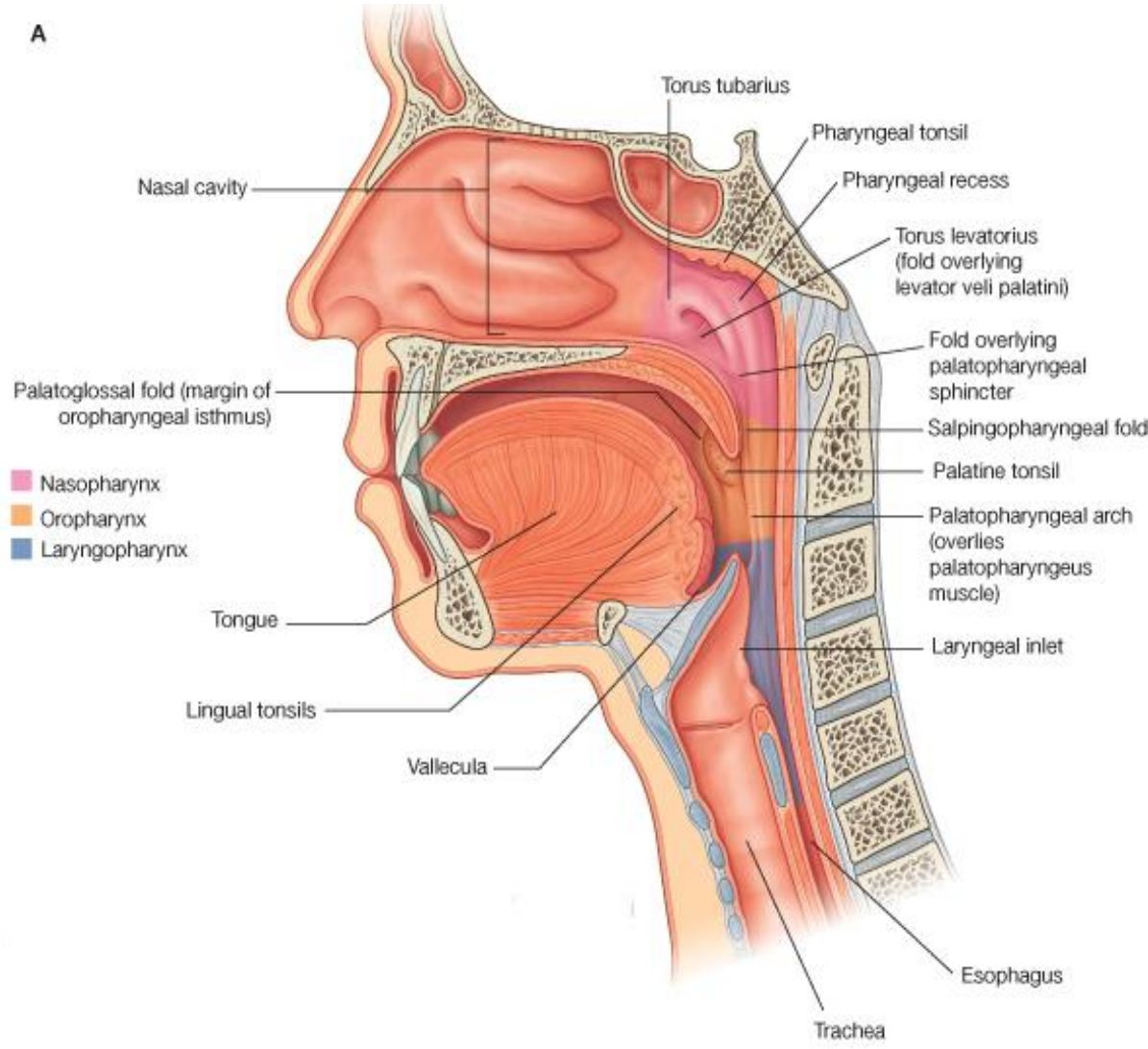


Features of Nasopharynx



Oropharynx

- Behind the oral cavity (in front of 2nd&3rd Cervical vertebra).
- From the soft palate superiorly to tip of epiglottis inferiorly.
- Below: it communicate with laryngo-pharynx.



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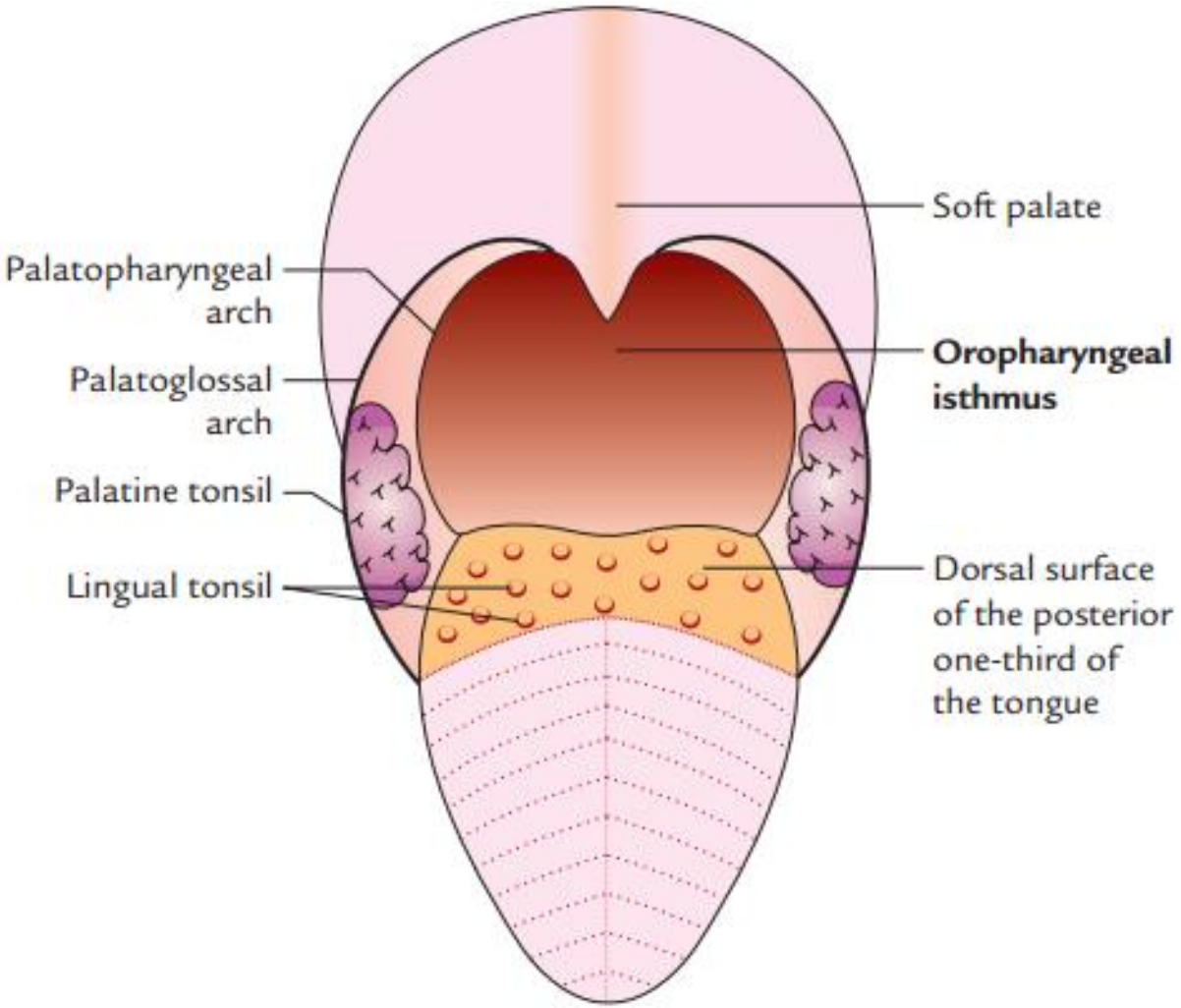
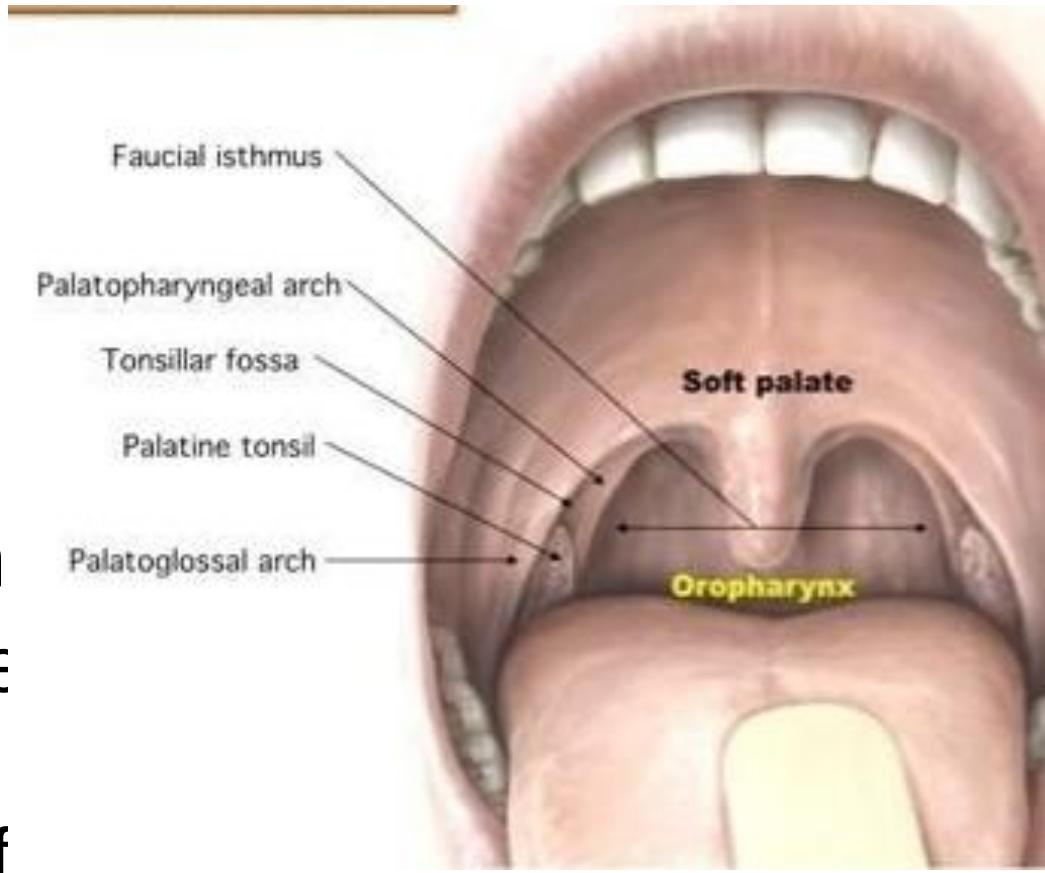
- Anteriorly communicates with oral cavity through **oropharyngeal isthmus**



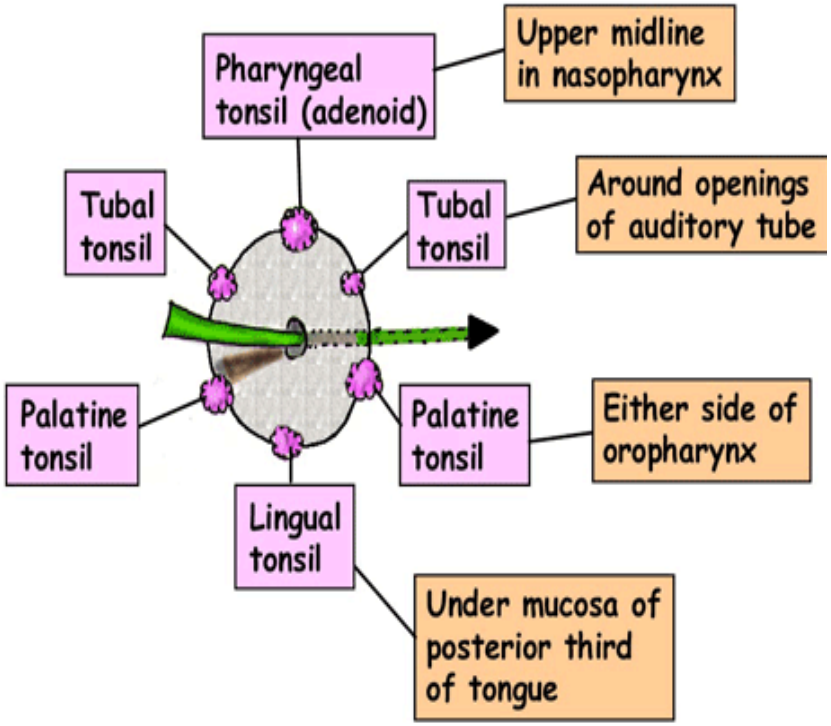
Tonsillar fossa

- Lateral wall presents **tonsillar fossa** which lodges palatine tonsil
- Boundaries:
- **Anteriorly**- palatoglossal arch
- **Posteriorly**- palatopharyngeal arch
- **Apex** -soft palte where both arches meet
- Base dorsal surface of tongue



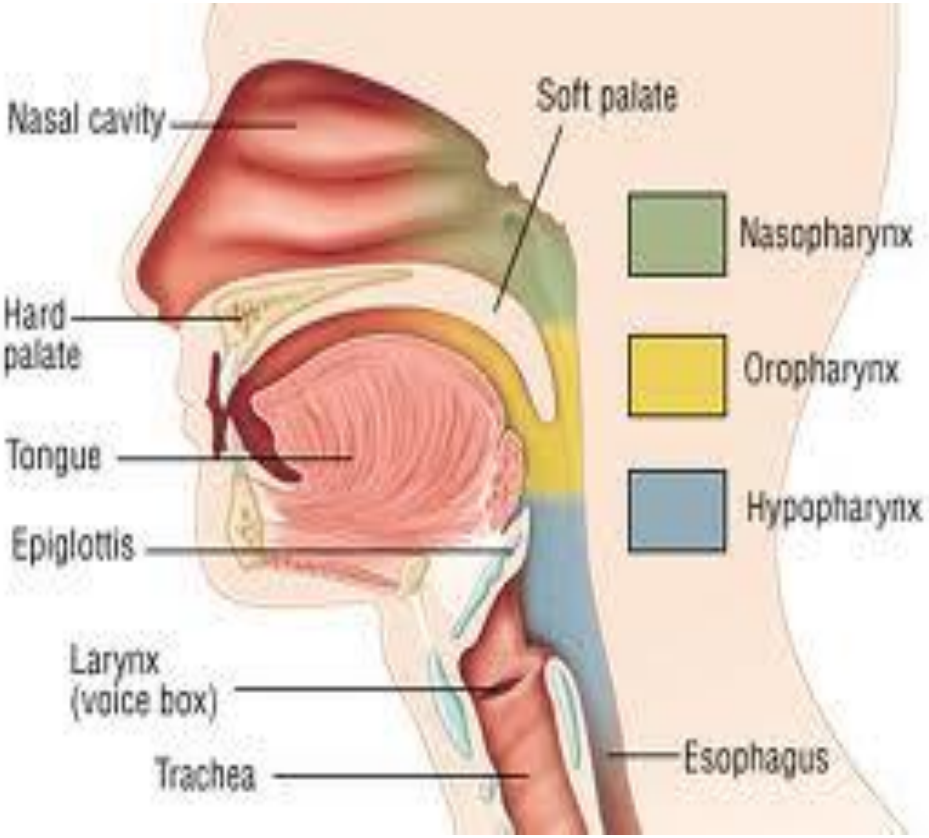
Waldeyer's ring

- **The lymphoid tissue in the pharyngeal aponeurosis aggregates in some areas forming tonsils:**
  - **Pharyngeal tonsil (1).**
  - **Tubal tonsil (2).**
  - **Palatine tonsil (2).**
  - **Lingual tonsil (1).**

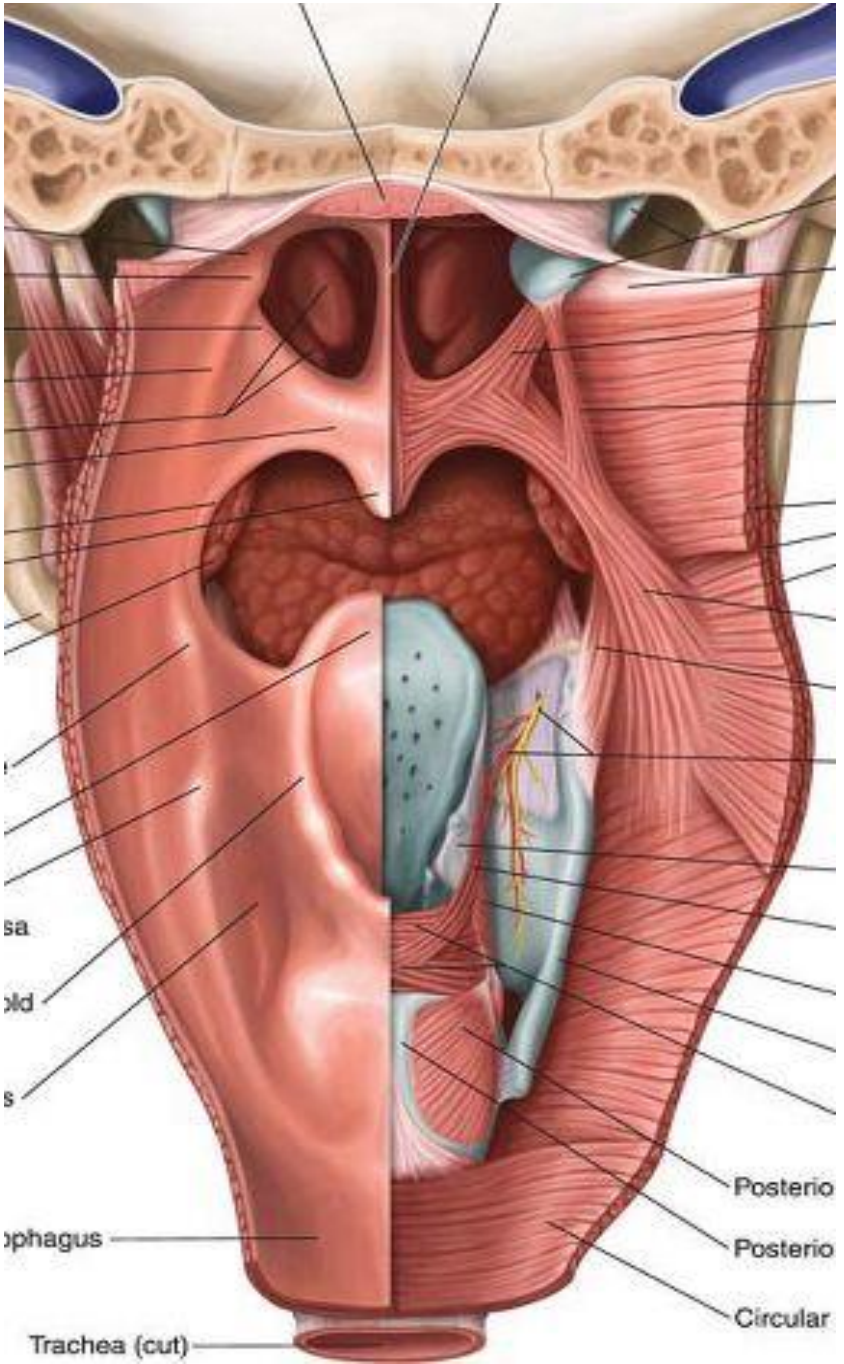


Laryngopharynx

- Lower part of the pharynx situated behind the larynx.
- **Extent:** from the upper border of epiglottis to the lower border of cricoid cartilage.

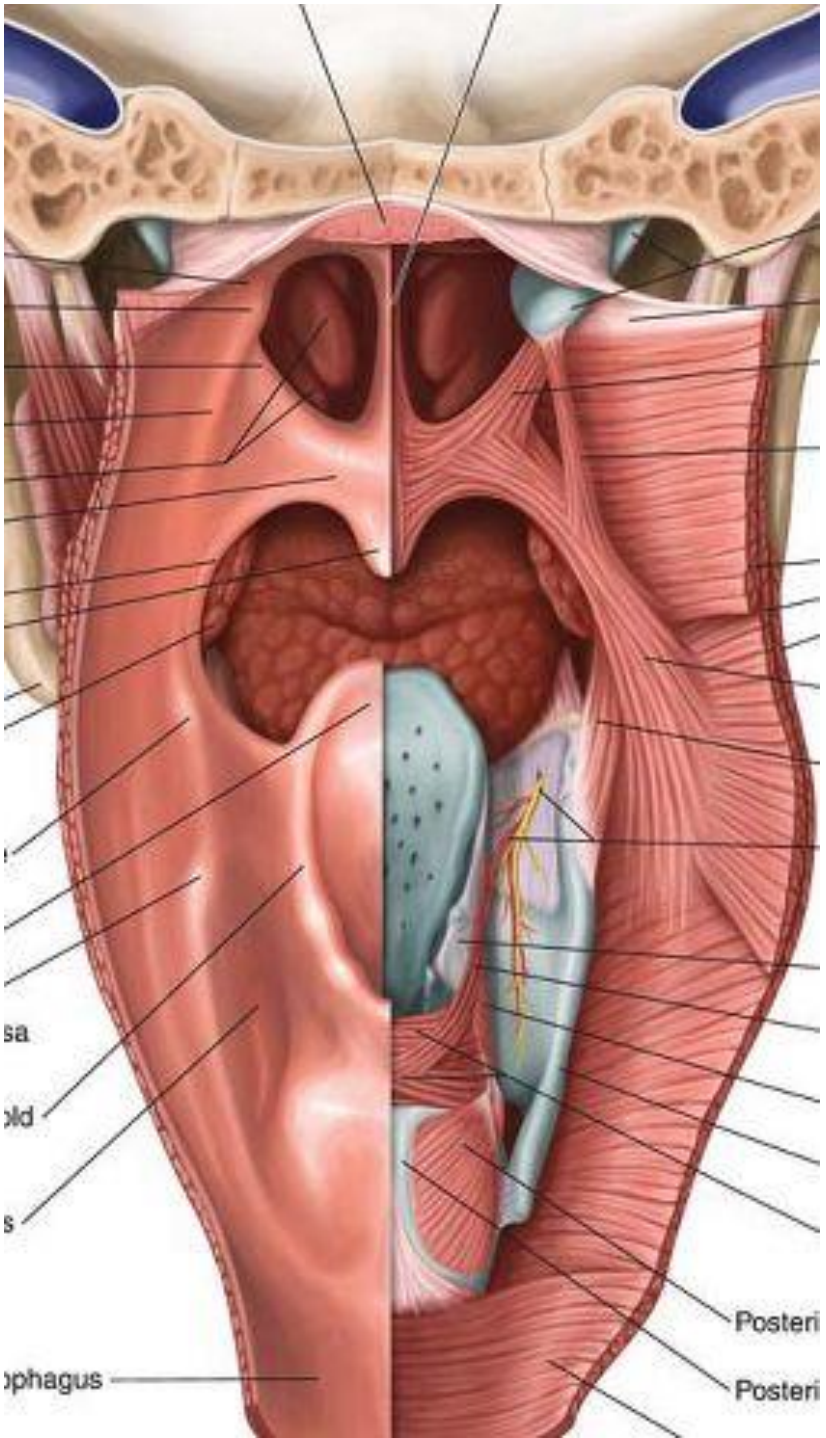


- **Communications**:
  - Anteriorly with the laryngeal cavity through laryngeal inlet
  - Inferiorly with oesophagus.
  - On each side presents the **piriform fossa**.



Boundaries

- **Anterior wall:**
  - inlet of larynx, and posterior surface of cricoid and arytenoid cartilage.
- **Posterior wall:**
  - mainly by fourth and sixth cervical vertebra.
- **Lateral wall:**
  - piriform fossa.

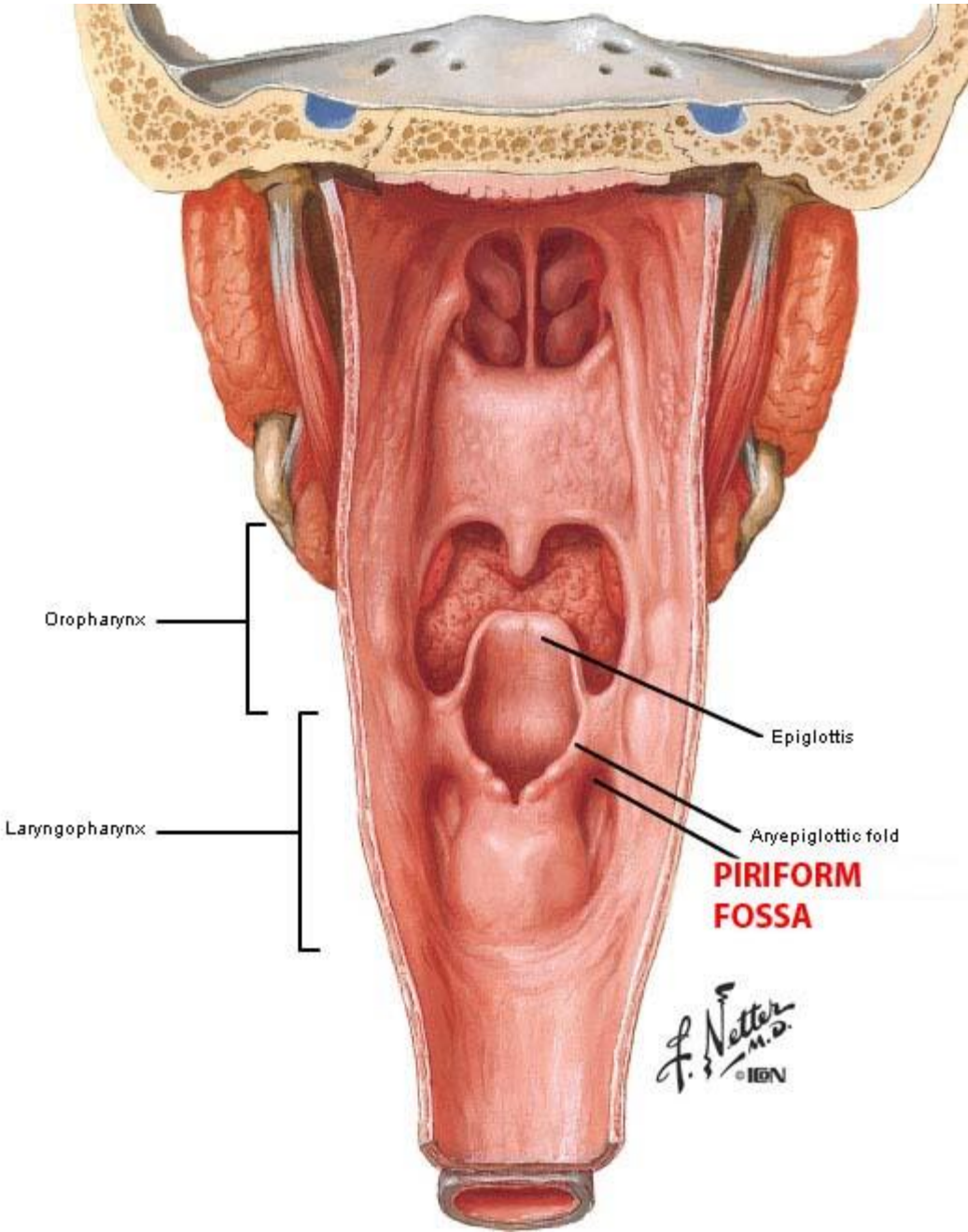


Piriform fossa

- Importance:

➢ lateral food channel.

➢ Catch point for foreign body.



Piriform fossa

Boundaries :

- *Medial:*
  - Aryepiglottic fold and quadrangular membrane of larynx.
- *Lateral:*
  - Mucous membrane covering of lamina of thyroid cartilage and thyrohyoid membrane.
  - Internal laryngeal nerve and superior laryngeal vessels pierce the thyrohyoid membrane.
- *Above:*
  - lateral glossoepiglottic fold (separates from epiglottic vallecula).

Structure of pharynx

- From within outwards

a) Mucosa

- Nasopharynx: Pseudostratified ciliated columnar epithelium
- Oro- and laryngo-pharynx: stratified squamous nonkeratinized epithelium

b) Pharyngo-basilar fascia: fibrous sheet internal to the pharyngeal muscles

c) Muscular coat

d) Buccopharngeal fascia

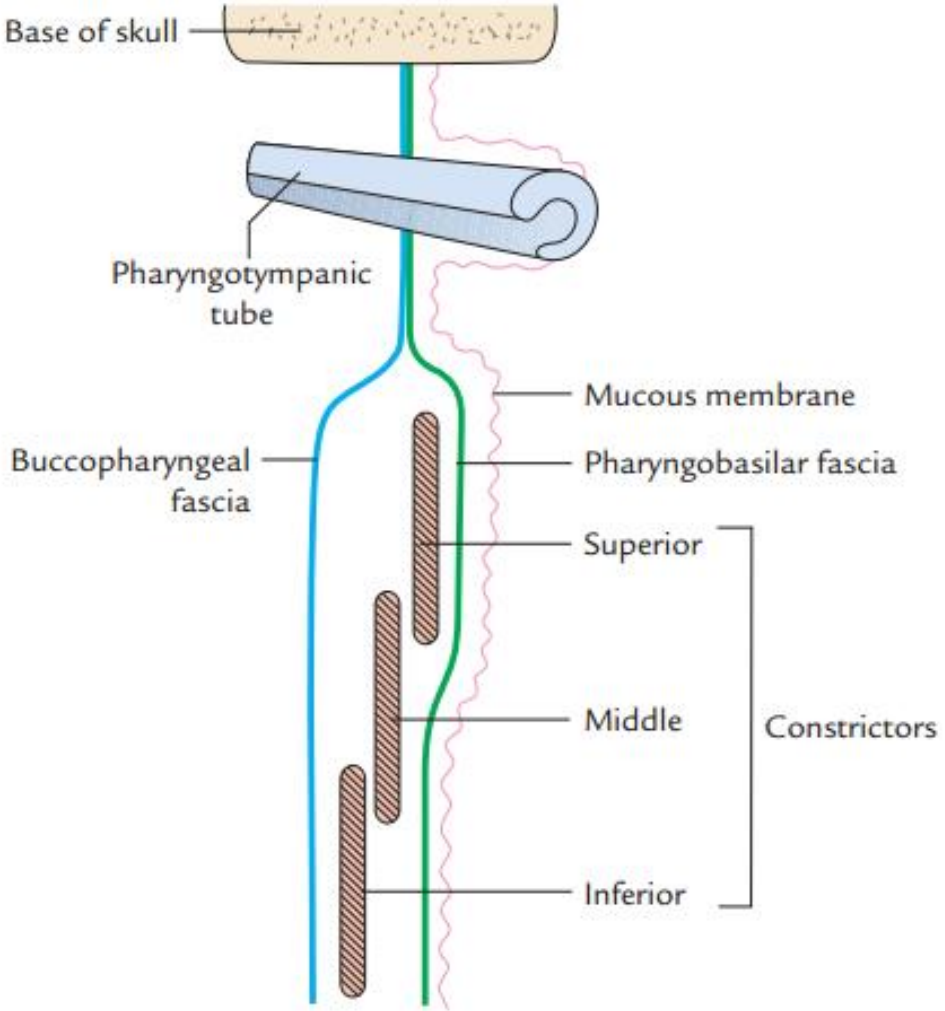
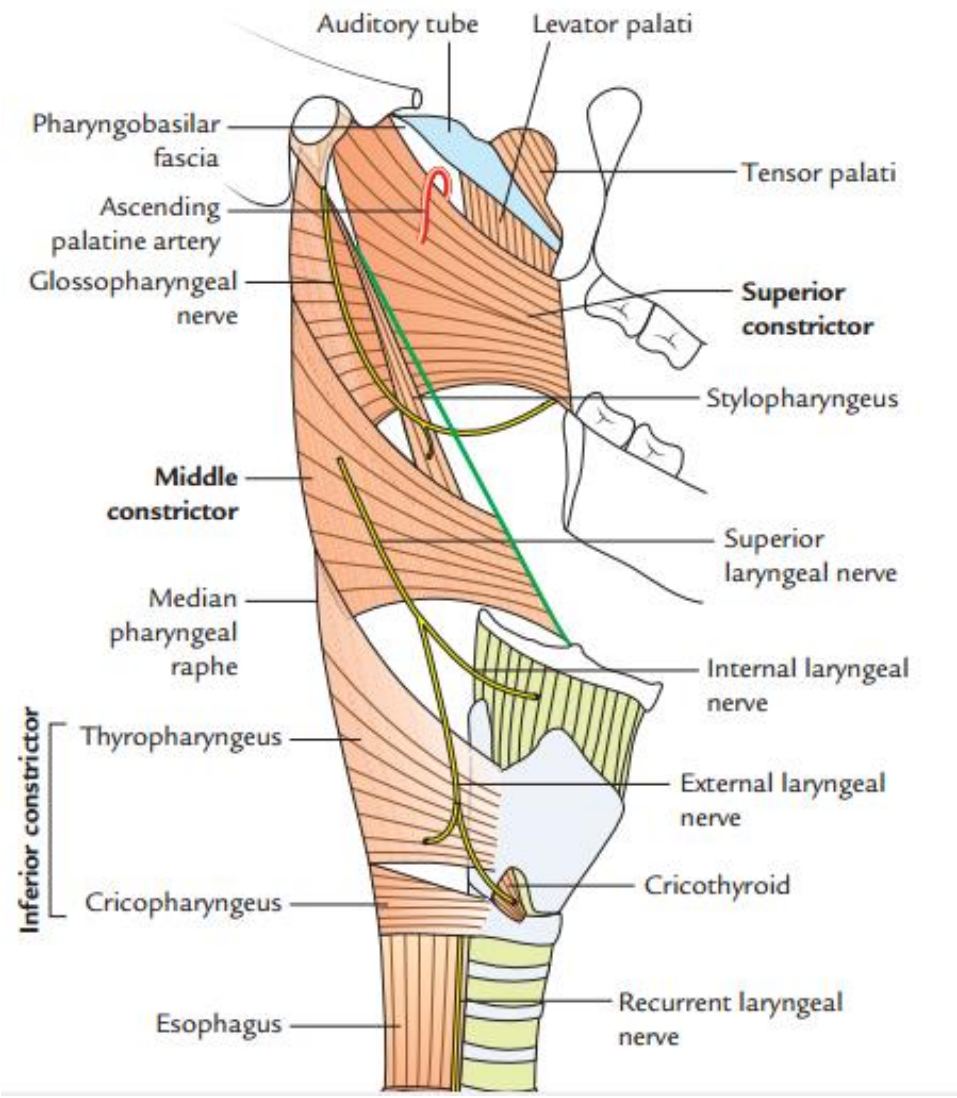
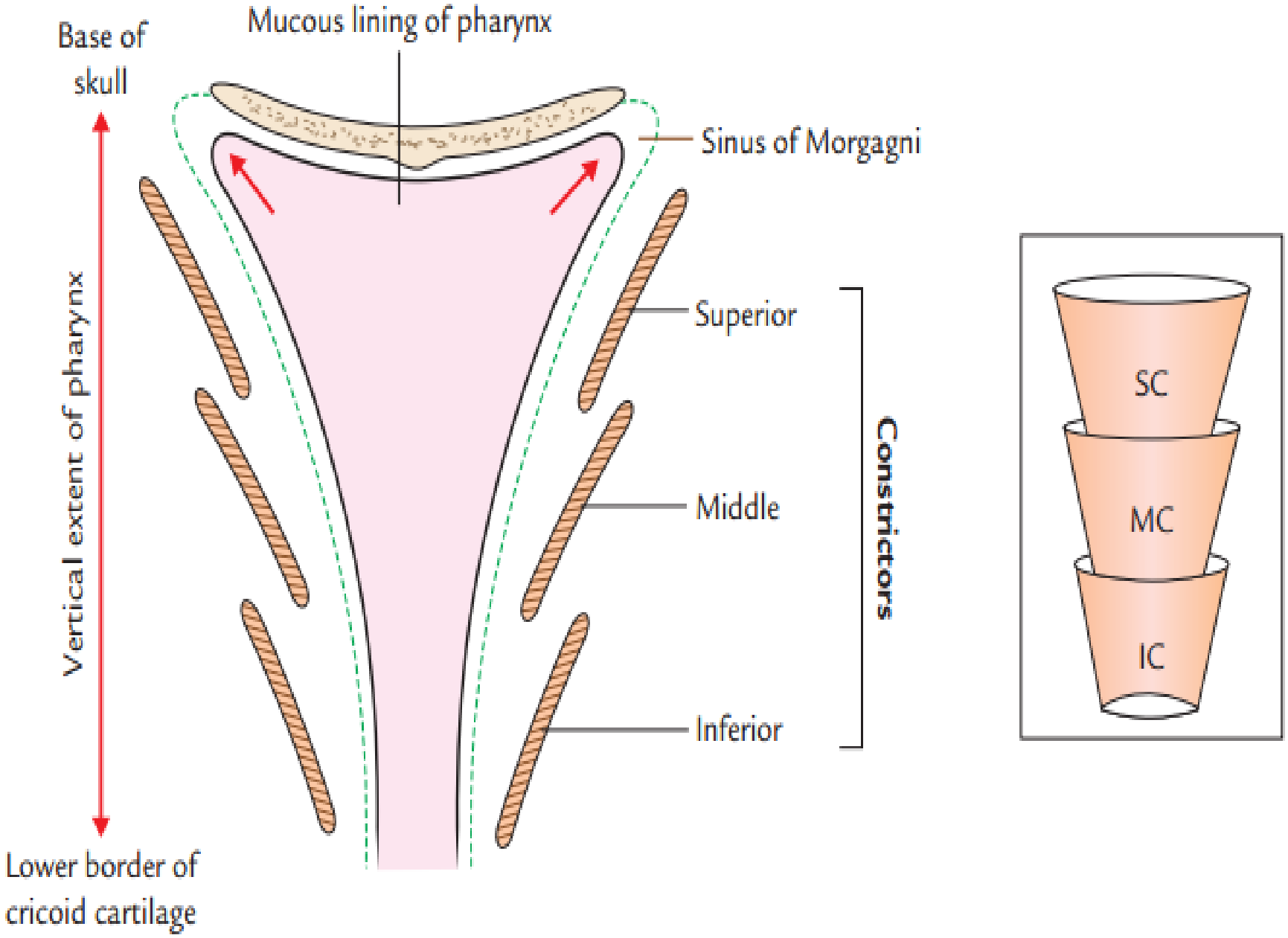


Fig. 14.7 Structure of the pharyngeal wall.

Muscles

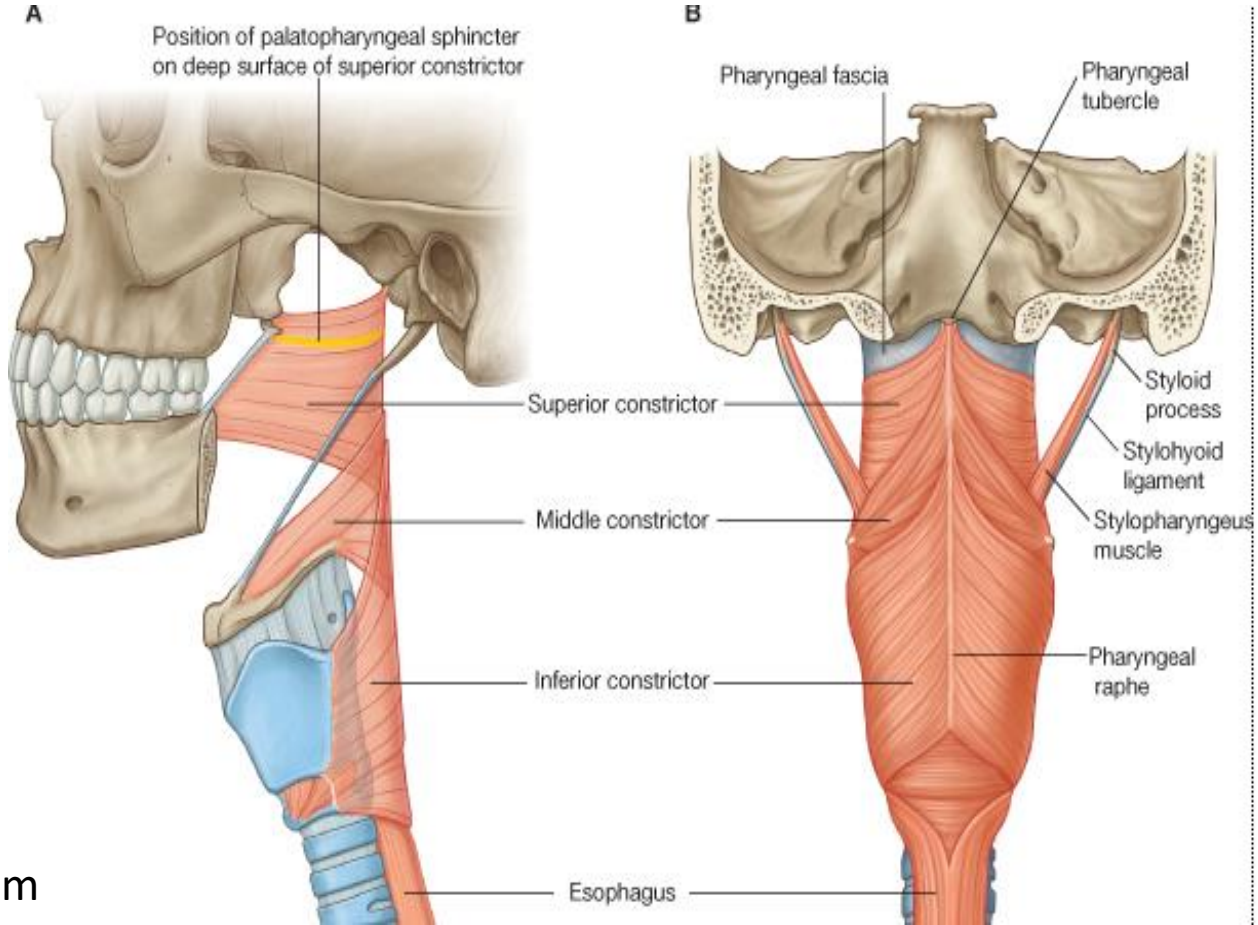
- Pharynx consists of striated muscles which are arranged in outer circular and inner longitudinal layers.
  - ❑ **Circular layer comprises**
    - Superior constrictor
    - Middle constrictor and
    - Inferior constrictor
  - These muscles joined together posteriorly by the **pharyngeal raphe**.
  - Anteriorly attach to bones and ligaments related to the lateral margins of the nasal and oral cavities and the larynx.





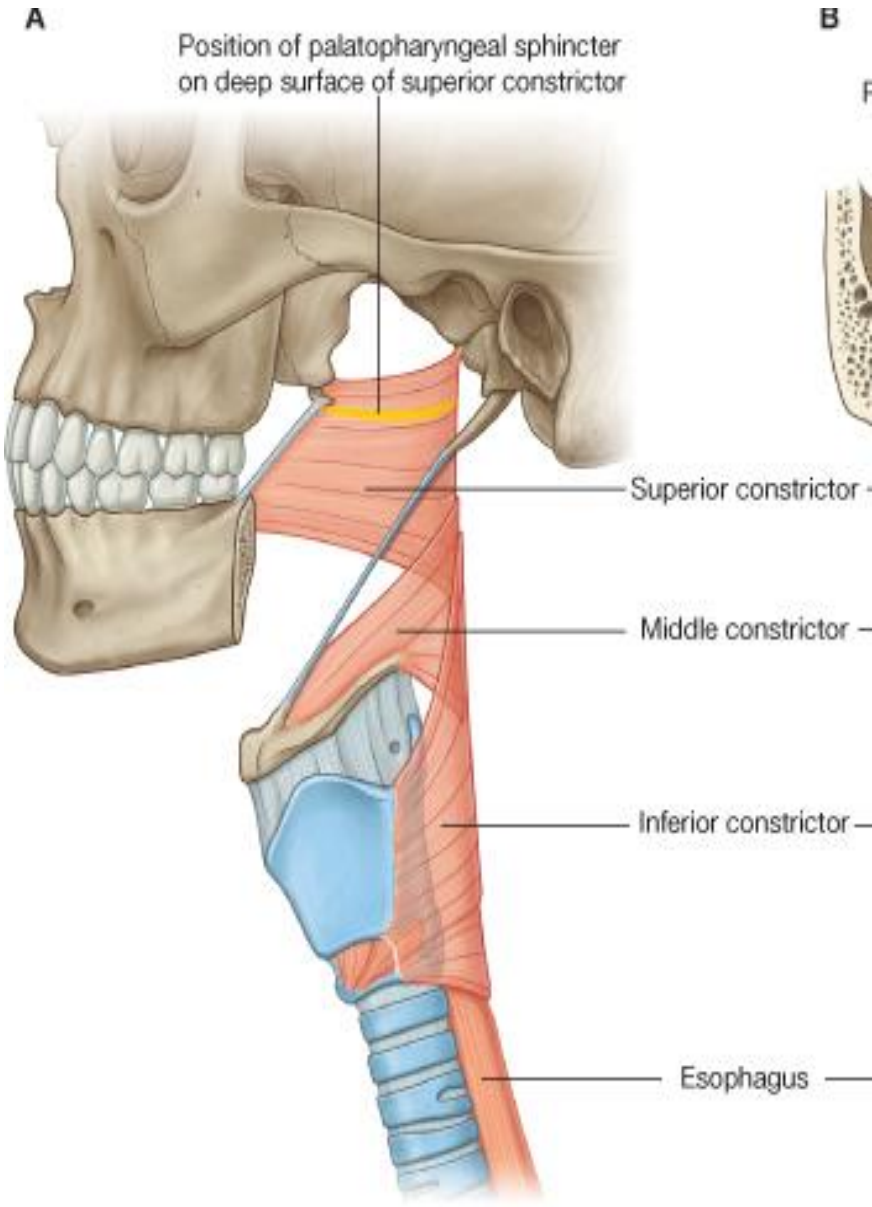
Superior constrictor

- Anteriorly attached to the medial pterygoid plate, pterygoid hamulus, pterygomandbular raphe, mylohyoid line of the mandible and side of the tongue.
- Posteriorly to the pharyngeal tubercle and pharyngeal raphe.



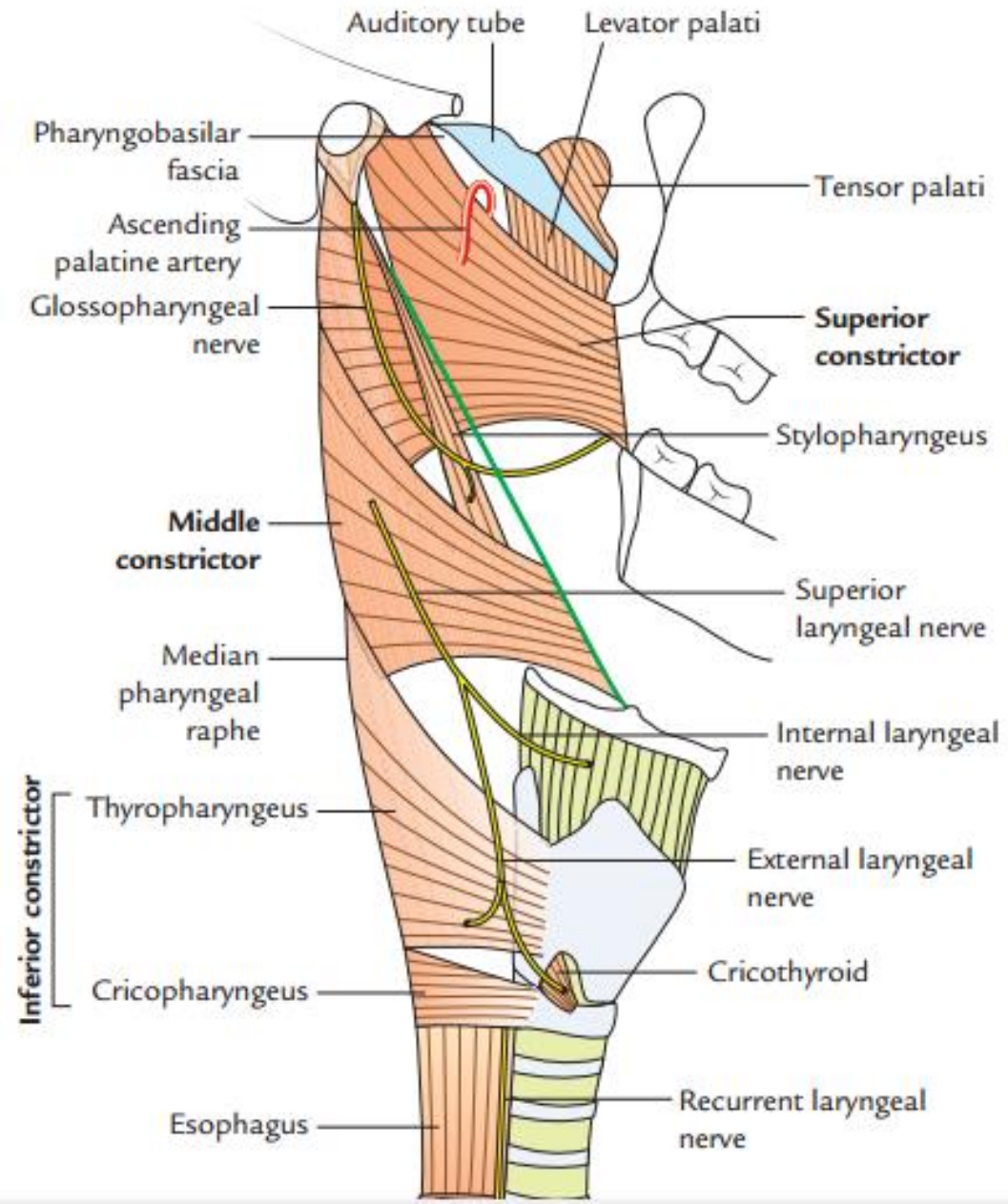
Middle constrictor

- Anteriorly attached to the lower aspect of the stylohyoid ligament, the lesser horn of the hyoid bone, and the entire upper surface of the greater horn of the hyoid bone.
- Posteriorly attach to the pharyngeal raphe.



Inferior constrictor

- Consist of two parts i.e
  - **Thyropharyngeus** arise from the oblique line and inferior horn of the thyroid cartilage.
  - **Cricopharyngeus** arise from the anterior arch of cricoid cartilage.
- posteriorly attach to the pharyngeal raphe
- **Dehiscence of Killian**



Constrictor muscle

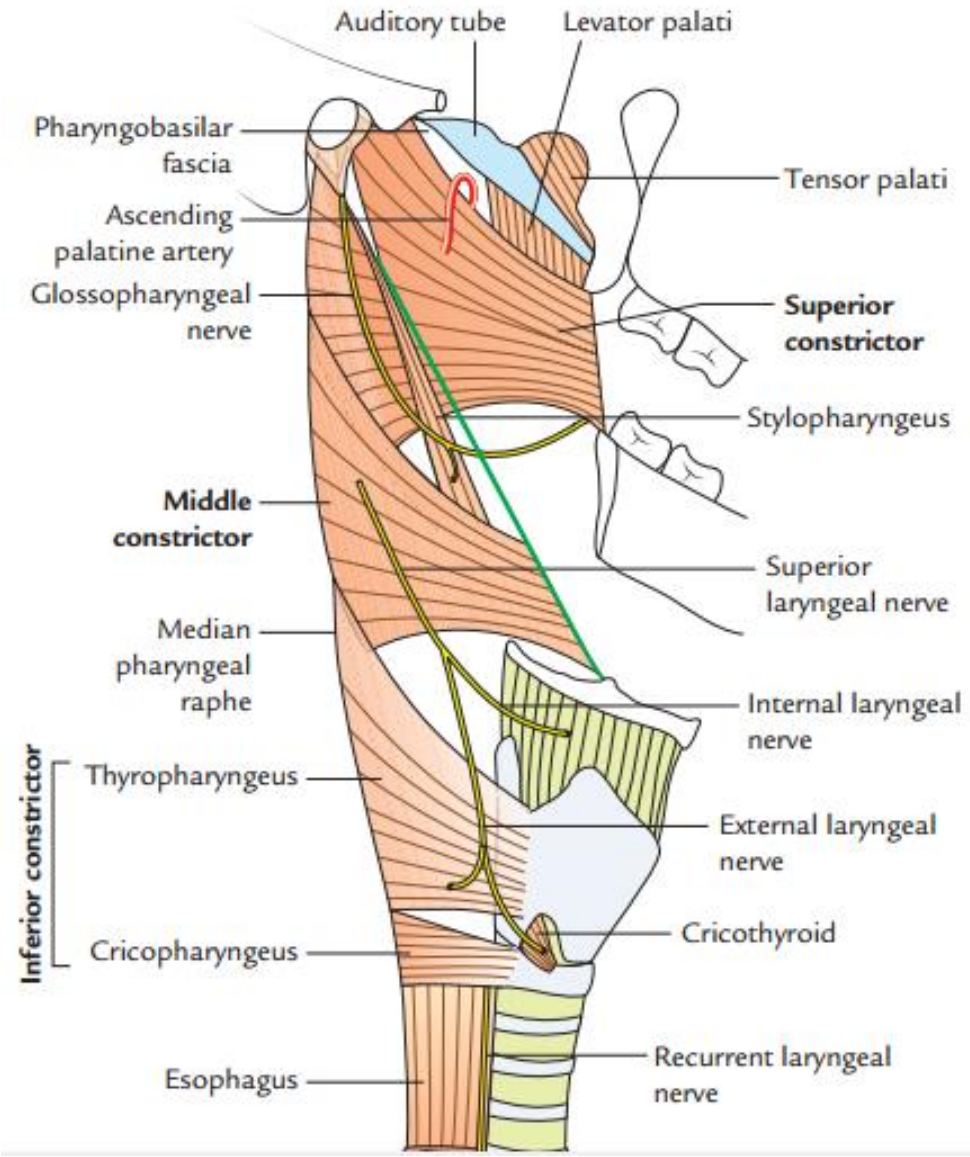
Muscle	Origin	Insertion	Nerve supply	Action
Superior constrictor (Quadrilateral in shape)	(a) Pterygoid hamulus (b) Pterygomandibular raphe (c) Medial surface of the mandible at the upper end of mylohyoid line (d) Side of the posterior part of the tongue	(a) Pharyngeal tubercle on the base of skull (b) Median fibrous raphe	Pharyngeal branch of the vagus nerve carrying fibres of cranial root of the accessory nerve	Helps in deglutition
Middle constrictor (Fan shaped)	(a) Lower part of the stylohyoid ligament (b) Lesser cornu of hyoid (c) Upper border of greater cornu of hyoid	Median fibrous raphe	Pharyngeal branch of the vagus nerve carrying fibres of cranial root of the accessory nerve	Helps in deglutition
Inferior constrictor (a) Thyropharyngeus	(a) Oblique line on lamina of the thyroid cartilage (b) Tendinous band between the thyroid (inferior) tubercle and cricoid cartilage	Median fibrous raphe	(a) Pharyngeal plexus and (b) External laryngeal nerve	Helps in deglutition
(b) Cricopharyngeus	Cricoid cartilage	Median fibrous raphe	Recurrent laryngeal nerve	

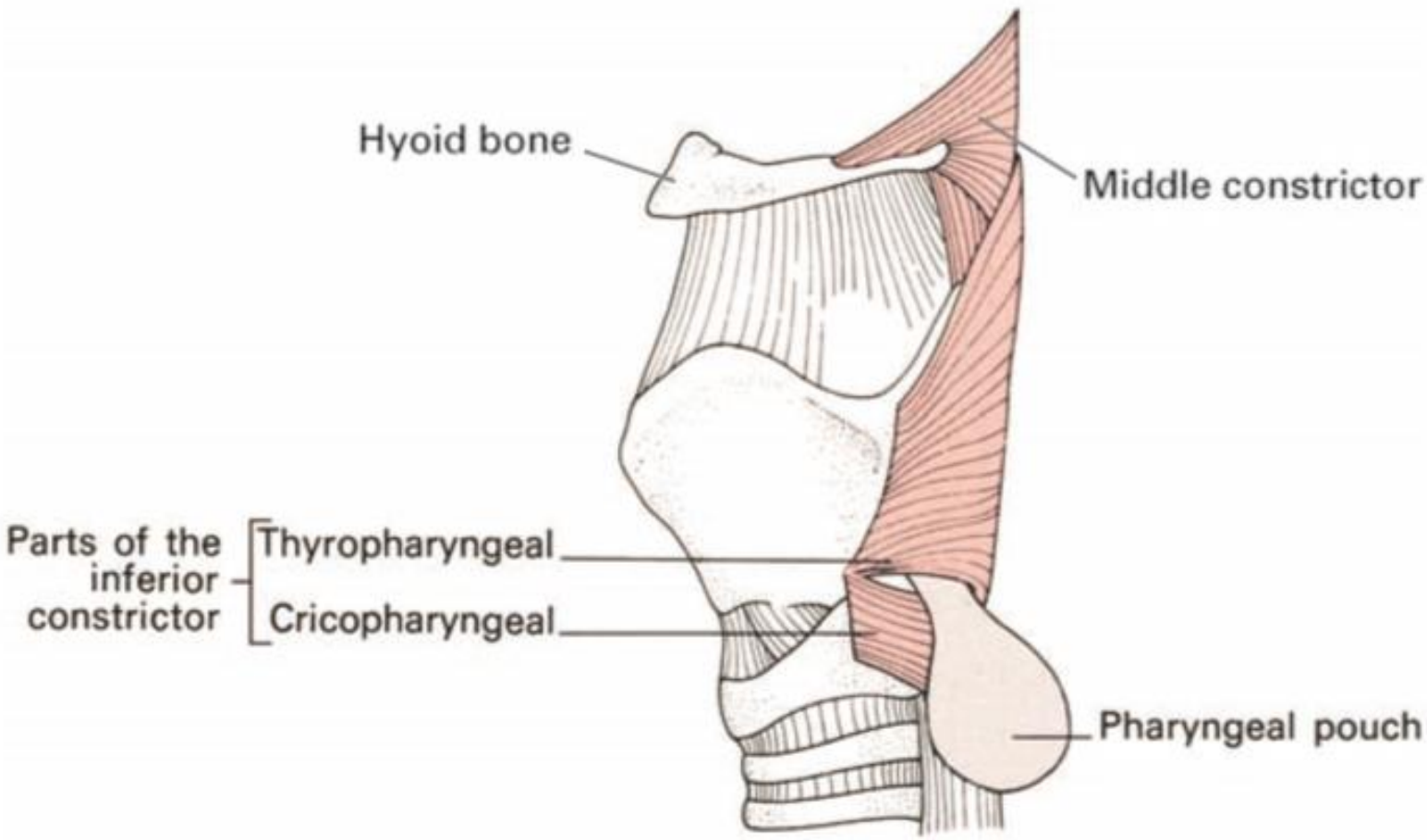
Killians Dehiscence

- The junction between the thyropharyngeus and crico-pharyngeus is the weakest part of the pharynx and is known as killians dehiscence.

- The area above the dehiscence is re-inforced by all the three constrictor muscles, but below the dehiscence is formed only by the crico-pharyngeus part of inferior constrictor.

- This weak point develops as **Diverticulum of pharynx.**





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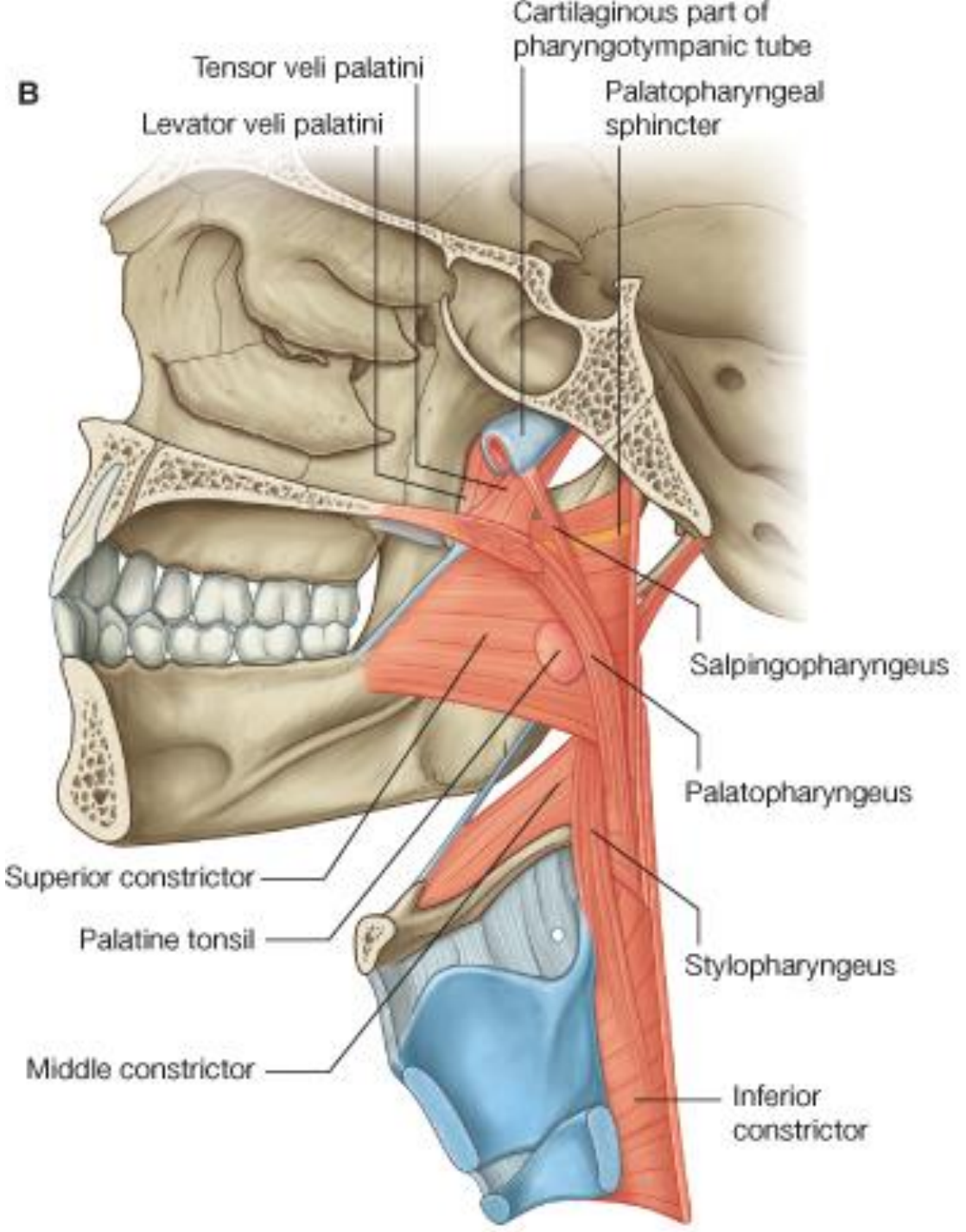
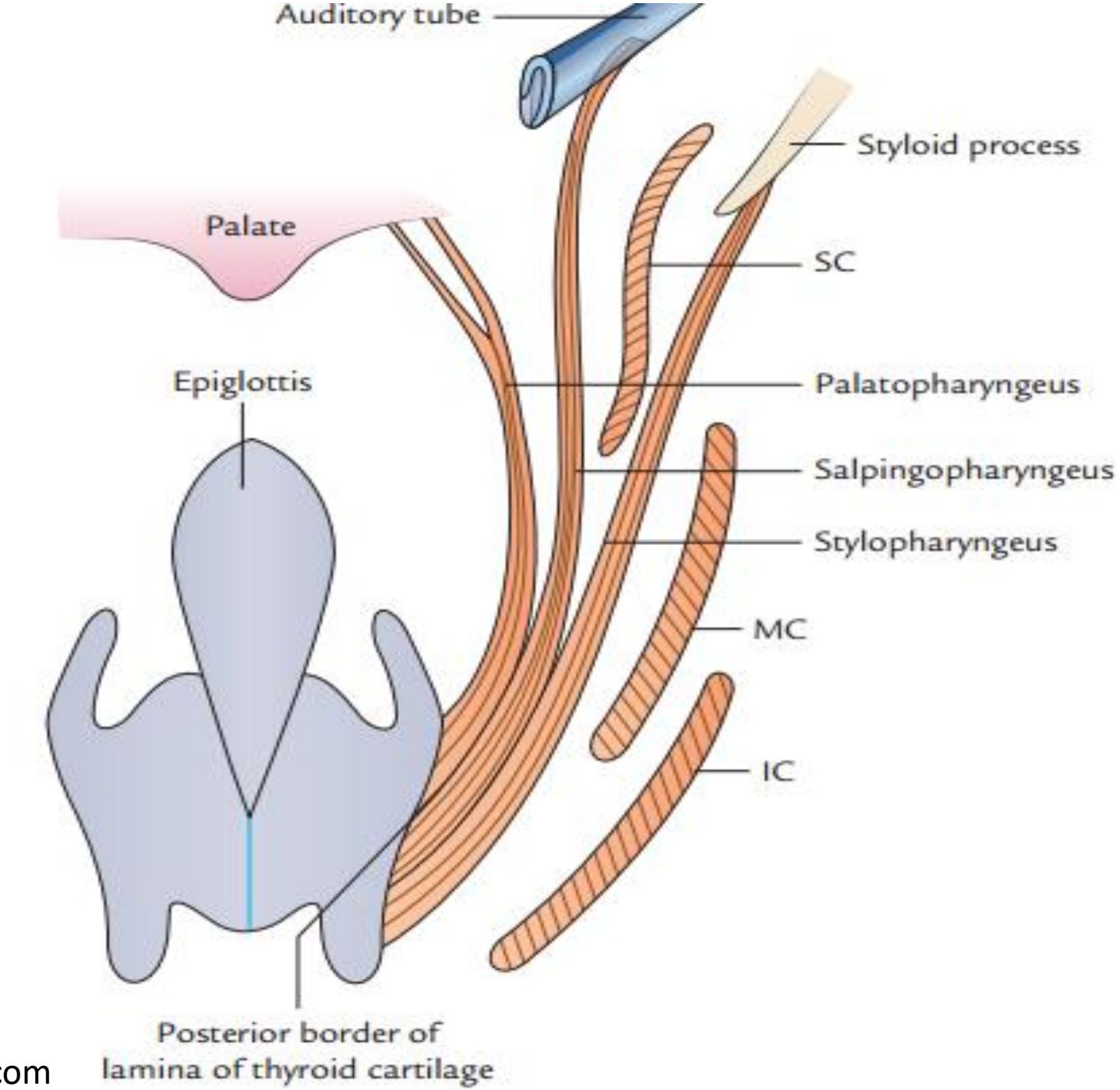
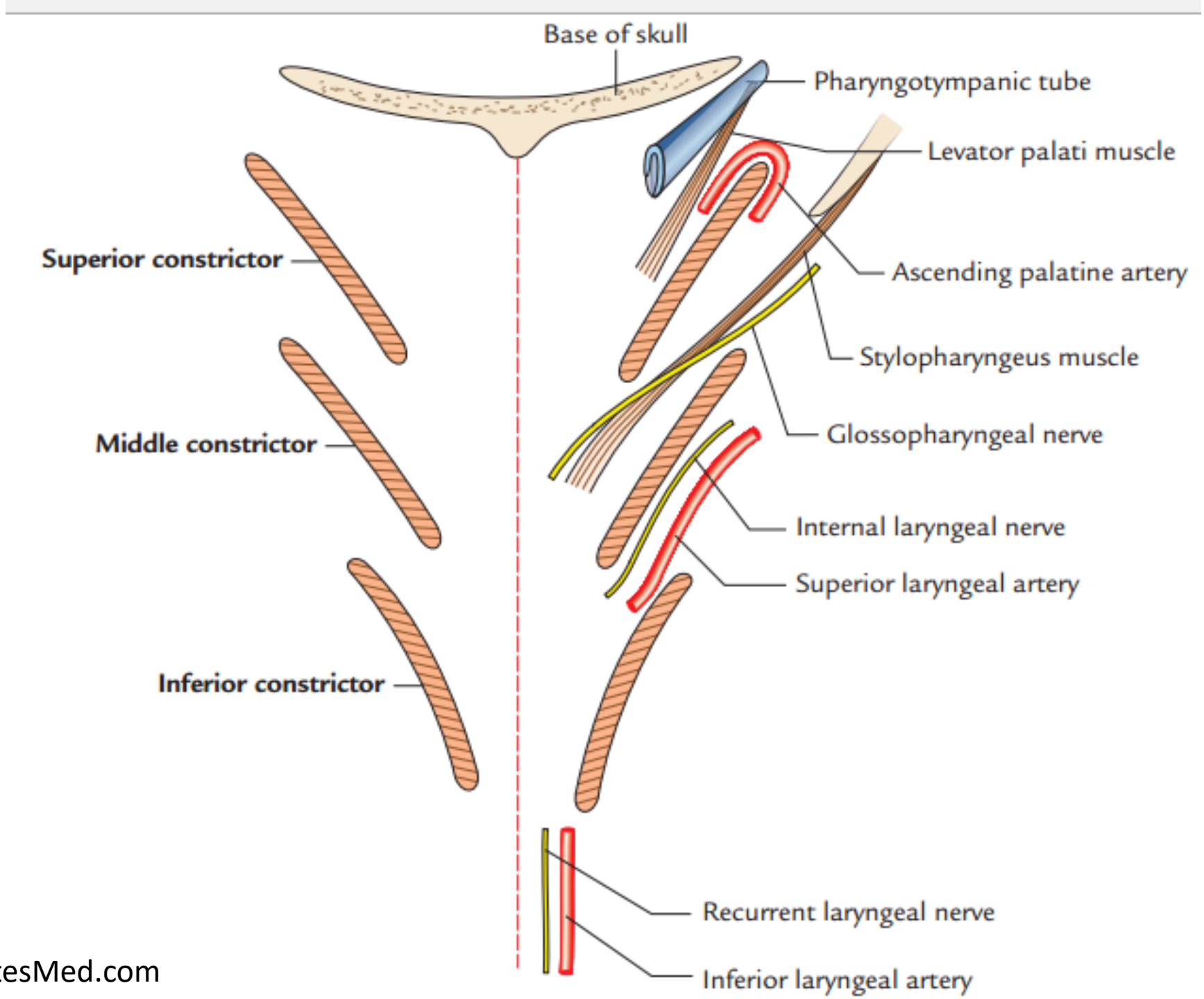
- **Longitudinal layer comprises**
  - Stylopharyngeus
  - Palatopharyngeus
  - Salpingopharyngeus

  – named according to their origins







Muscle	Origin	Insertion	Nerve supply
Stylopharyngeus	Medial surface of the base of styloid process	Posterior border of the lamina of thyroid cartilage	Glossopharyngeal (IX) nerve
Palatopharyngeus	By two fasciculi (anterior and posterior) from the upper surface of the palatine aponeurosis	Posterior border of the lamina of thyroid cartilage	Cranial root of 11th cranial nerve by pharyngeal plexus
Salpingopharyngeus	Lower part of the cartilage of the auditory tube	Posterior border of the lamina of thyroid cartilage	Cranial root of 11th cranial nerve by pharyngeal plexus

Gap	Structures passing through them
Between the base of skull and the upper concave border of superior constrictor (sinus of Morgagni)	• Auditory tube • Levator palati muscle • Ascending palatine artery • Palatine branch of the ascending pharyngeal artery
Between the superior and middle constrictors	• Stylopharyngeus muscle • Glossopharyngeal nerve
Between the middle and inferior constrictors	• Internal laryngeal nerve • Superior laryngeal vessels
Between the lower border of inferior constrictor and the esophagus (in the tracheo-esophageal groove)	• Recurrent laryngeal nerve • Inferior laryngeal vessels

Nerve supply of the pharyngeal muscles

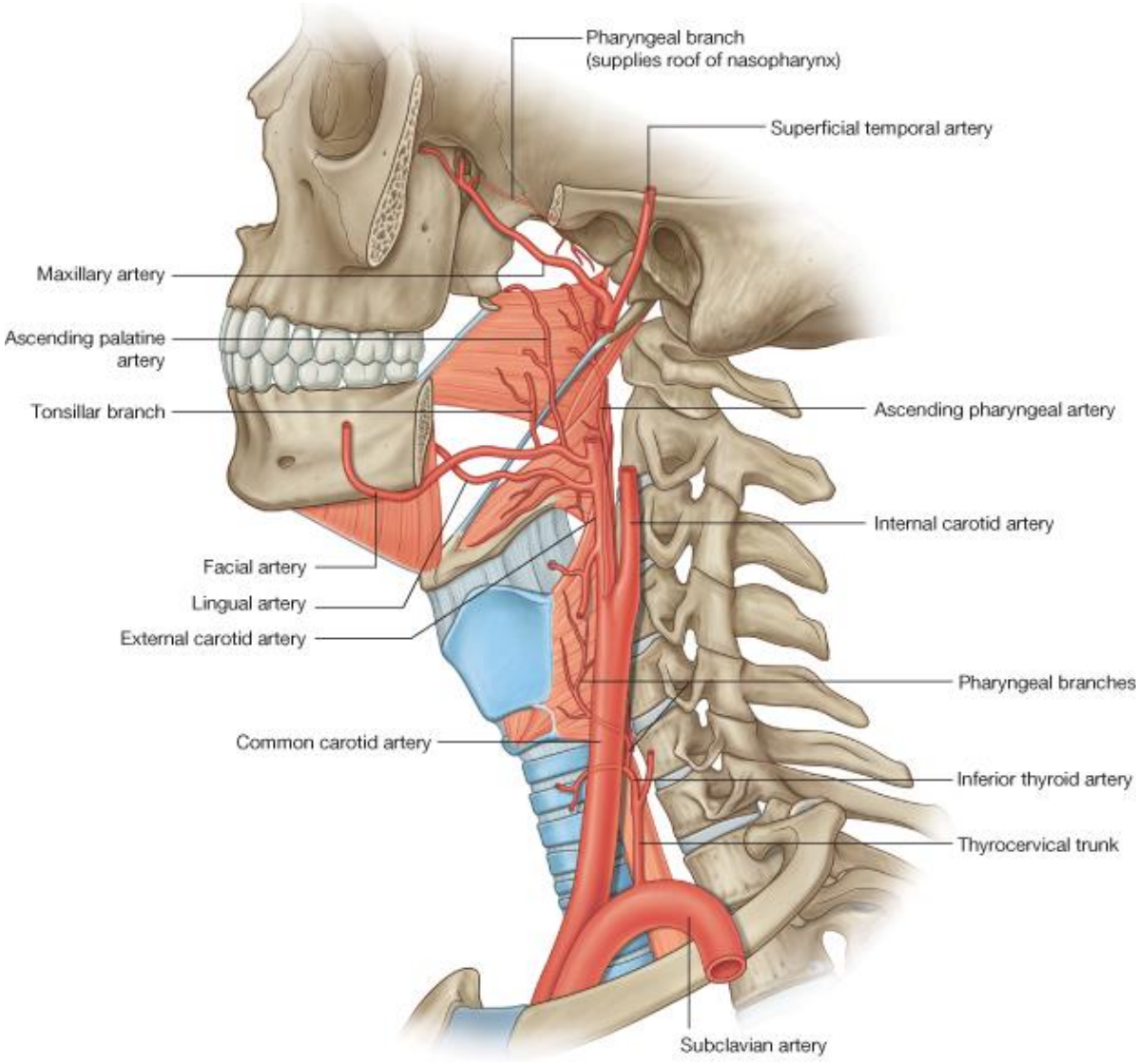
- **Motor:**
  - all the muscles of pharynx is supplied by the **cranial part of accessory nerve** via the pharyngeal plexus **except stylopharyngeus**
  - Stylopharyneus is supplied by glossopharyngeal nerve
  - Inferior constrictor muscle also receive additional supply from the external and recurrent laryngeal nerve

- **Sensory:**
  - Naso-pharynx : by maxillary nerve through pharyngeal branch of pterygopalatine ganglion.
  - Oro-pharynx : by glossopharyngeal nerve.
  - Laryngo-pharynx : by the internal laryngeal nerve.

Blood supply

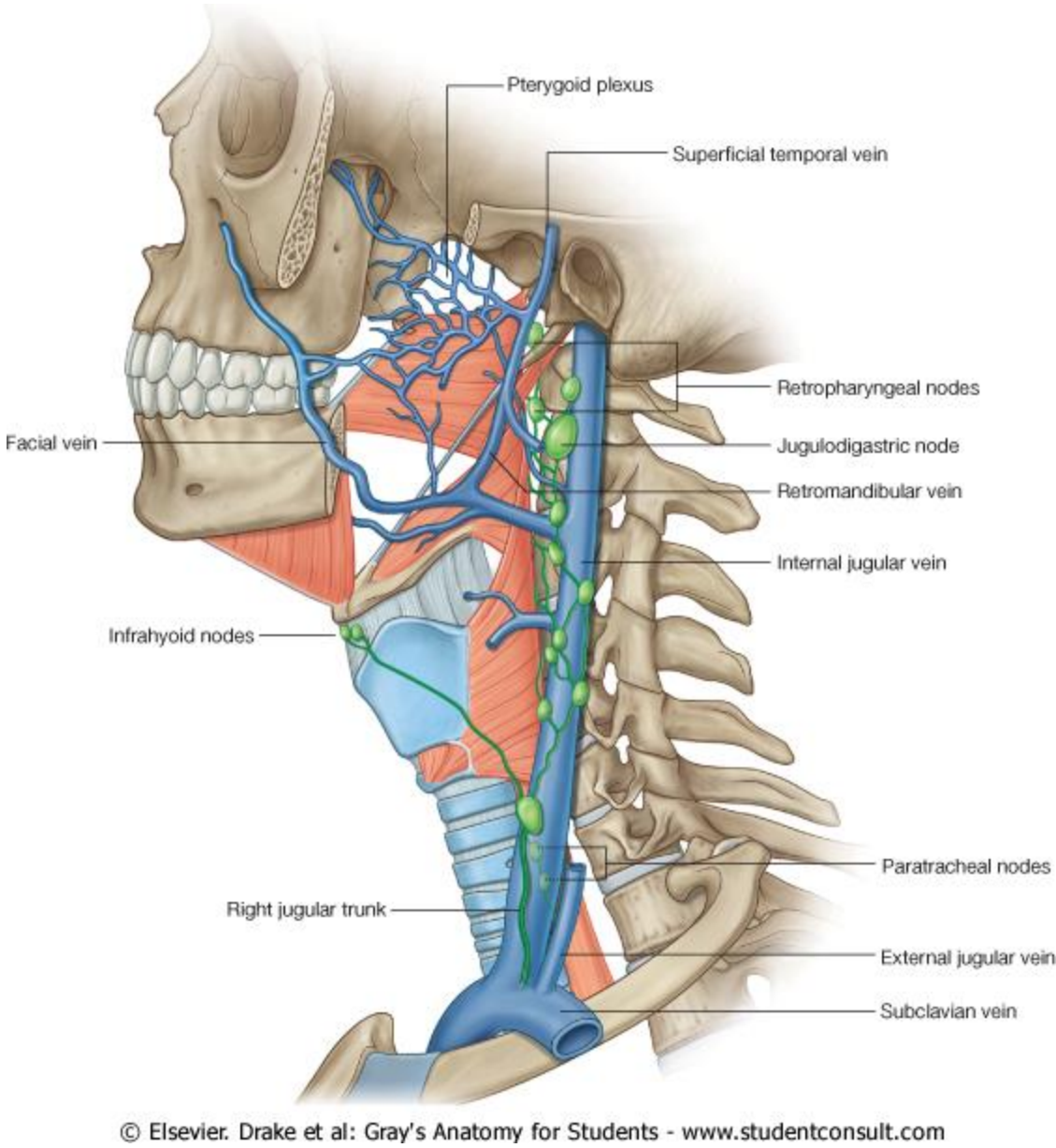
- Arterial supply

- Ascending pharyngeal,
- Ascending palatine and tonsillar branches of the facial artery.
- Greater palatine, pharyngeal and pterygoid branches of maxillary artery, and
- Dorsal lingual branches of the lingual artery.



- Venous supply

  Vein of the pharynx form a **pharyngeal venous plexus** which join with the pterygoid venous plexus, and drain into the internal jugular vein.



Applied Anatomy

- **Adenoids**
- **Tonsillitis** may cause referred pain in ear as glossopharngeal nerve supplies both these area.
- Infection may pass from the throat to the middle air through the auditory tube. This is more common in children because the tube is shorter, wider and straighter in them.