



Cranial nerves IX and X .

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objects

1.IX-Follow up its course from its central connections, exit from the brain and down to its target organs.

2-Make a list of types of nerve modalities conveyed by this nerve.

3-Review structure of the pharynx. X Follow up its course from its central connections, exit from the brain and down to its target organs.

4-Make a list of types of nerve modalities it conveys.

5-Review the structure of the larynx.

6-Make note of plexuses it creates in the mediastinum.

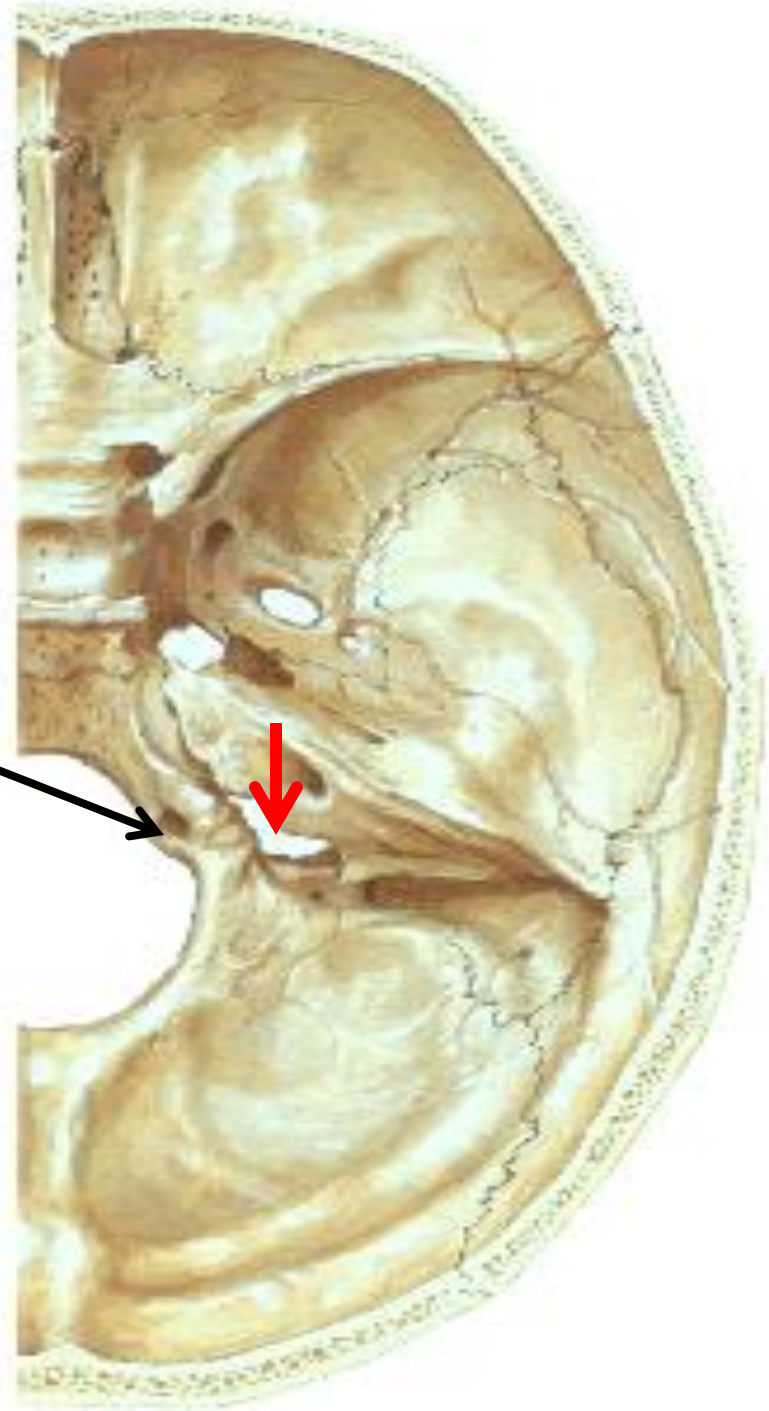
Attachment to brain stem

- Hypoglossal XII at groove between pyramid (P) & olive (O)
- IX, X, XI at groove between olive & Inferior cerebellar peduncle



Exit from skull

- IX, X, XI through jugular foramen
- XII through hypoglossal canal



Glossopharyngeal nerve IX

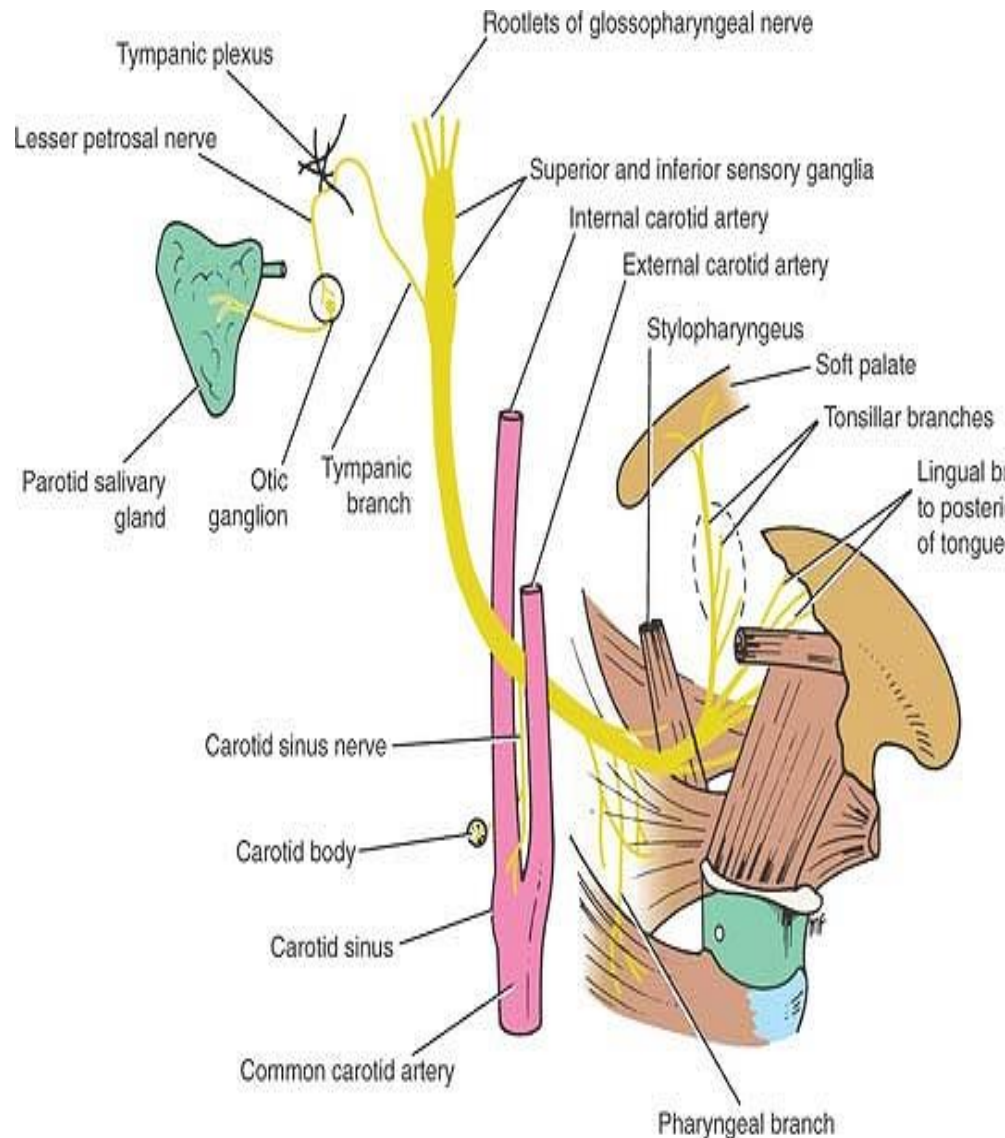
- Superiorly, glossopharyngeal nerve shows 2 ganglia

- Extracranial course:

Passes **between** I.J.V. & I.C.A. (within carotid sheath).

Passes **between** I.C.A. & E.C.A.

It curves forwards to pass **between** superior and middle constrictors of pharynx and **deep to hyoglossus** muscle to be distributed to tonsil, tongue (posterior 1/3 and vallate papillae) and pharynx (mucous membrane).



Solitary nucleus

Nucleus ambiguus

Inferior salivary nucleus

Glossopharyngeal nerve

**Special sensitive fibres
(taste, carotid sinus)**

Parasympathetic fibres
Along facial and trigeminal nerves

Motor fibres

Tongue, Carotid

Stylopharyngeus muscle

Pharynx, Tonsil

Parotid gland (secretion)

Ear

General sensitive fibres

Trigeminal spinal tract

Along the glossopharyngeal nerve

Trigeminal nucleus

• Branches:-

• Tympanic branch: - enters middle ear & share in forming tympanic plexus (gives the lesser petrosal n. (for parotid gland) + sensory supply to mucosa of middle ear .

• Carotid branch: supply the carotid sinus & carotid body

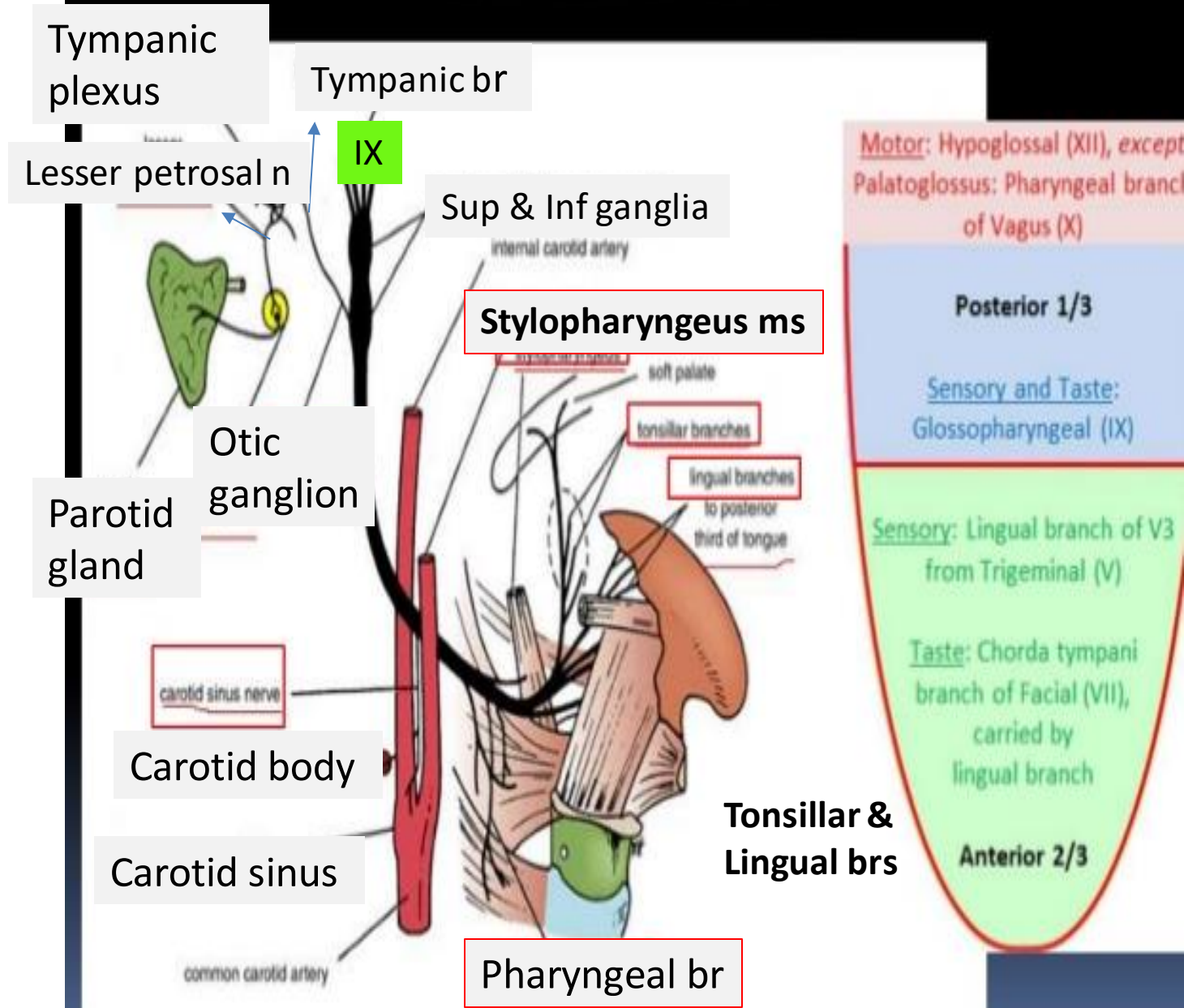
• Pharyngeal branch: - share in pharyngeal plexus supply pharynx by sensory fibres.

• Muscular: branch to stylopharyngeus m.

• Tonsillar: - supply palatine tonsil & soft palate.

• Lingual (terminal): to mucosa of posterior 1/3 of tongue, carry general sensation & taste sensation.

BRANCHES

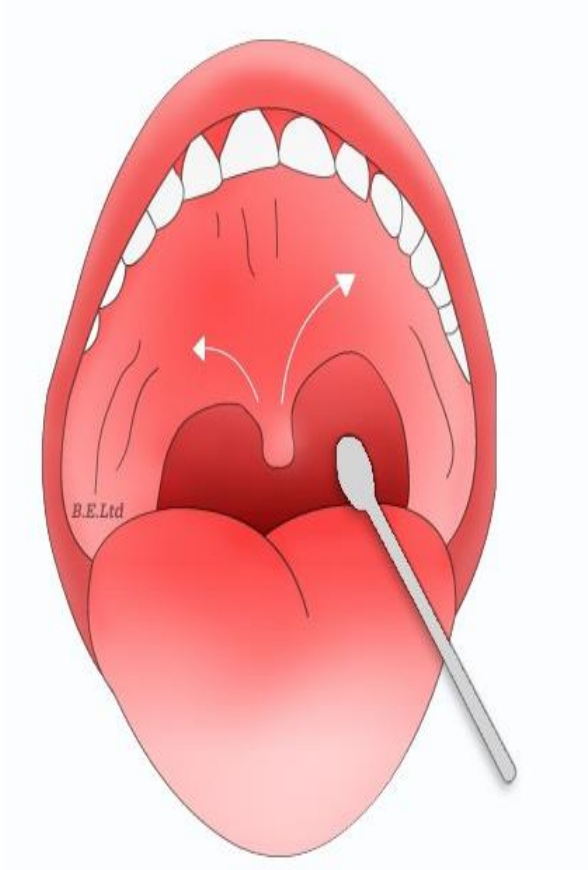


Applied anatomy

- **Gag reflex**: touch mucous membrane of tonsil with a wooden spatula....the patient gags (the pharyngeal muscles contract)

It is a test for both IX & X cranial nerves

- **Test for taste** on posterior 1/3 of tongue



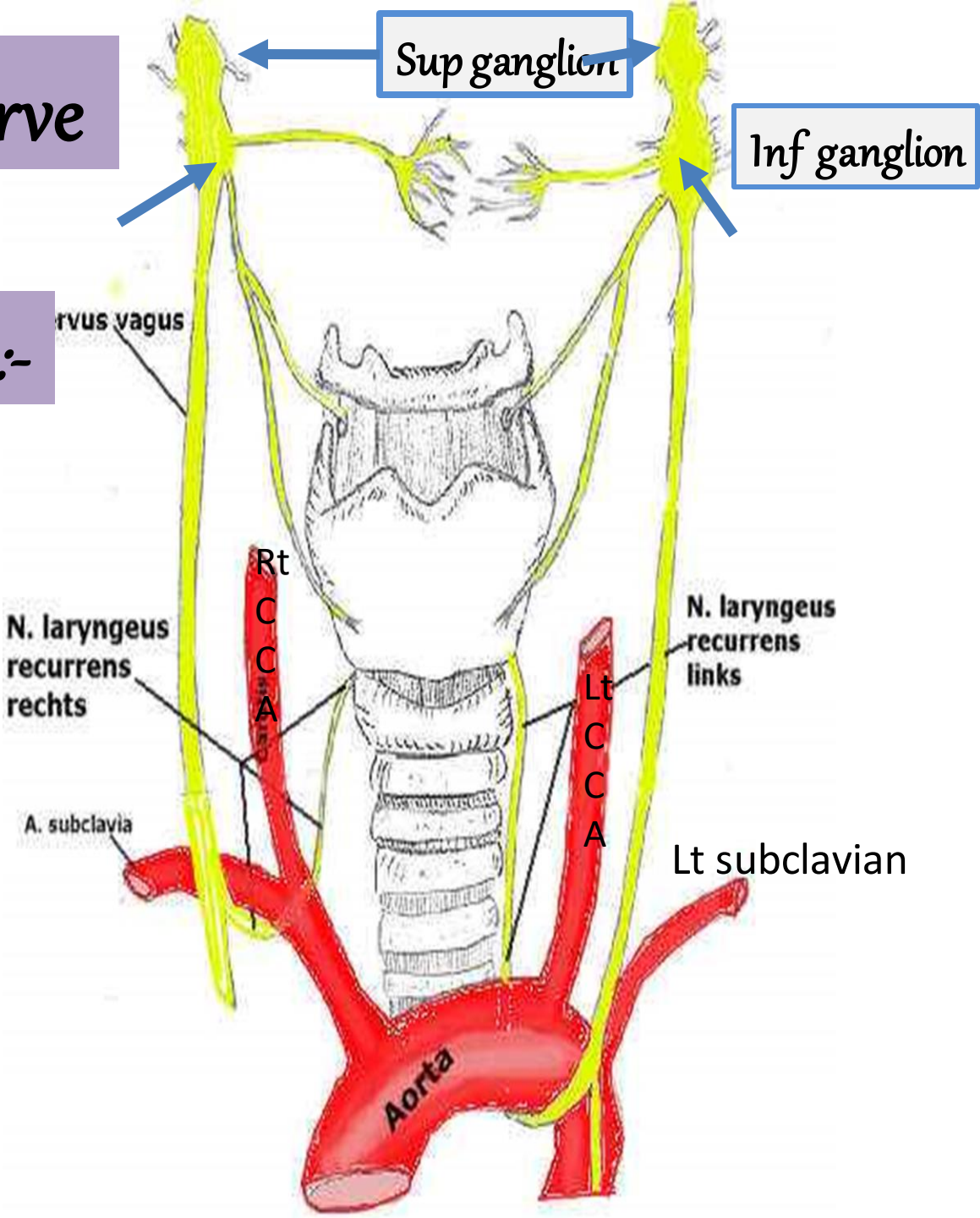
Vagus nerve X

- Longest cranial nerve
- Supplies structures in head & neck, thorax & abdomen.

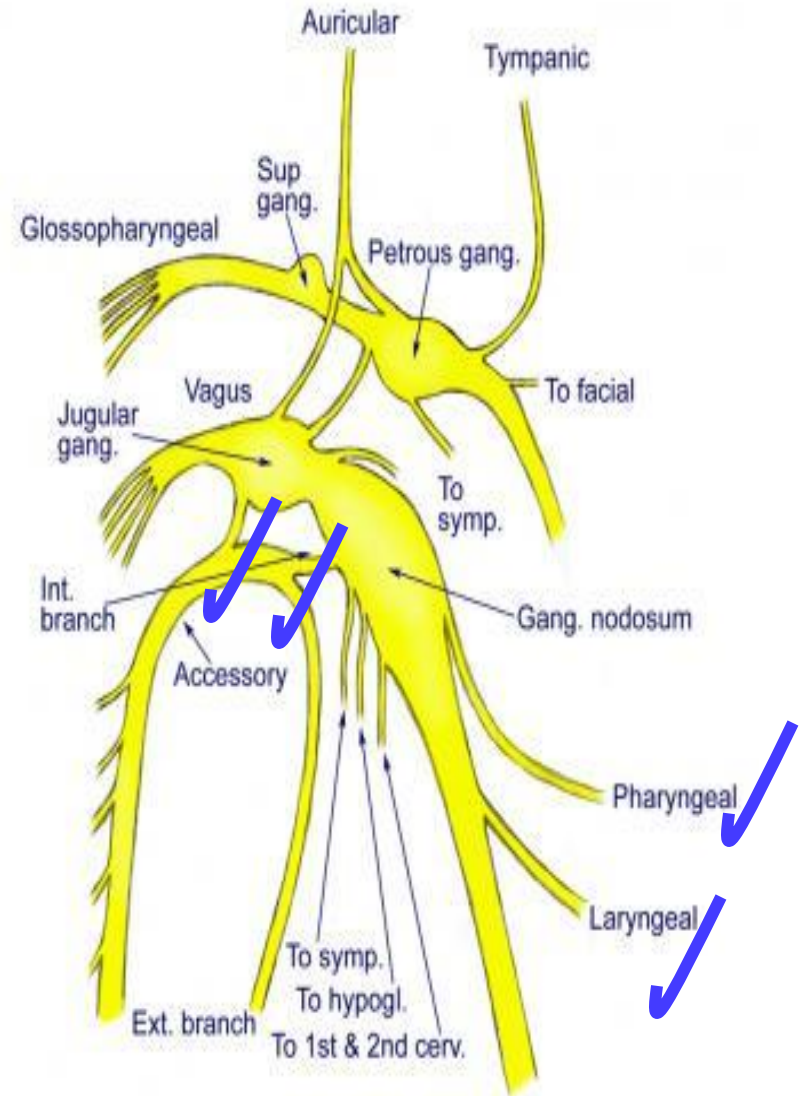
Vagus nerve

Extracranial course:-

riorly, vagus n shows 2
glia

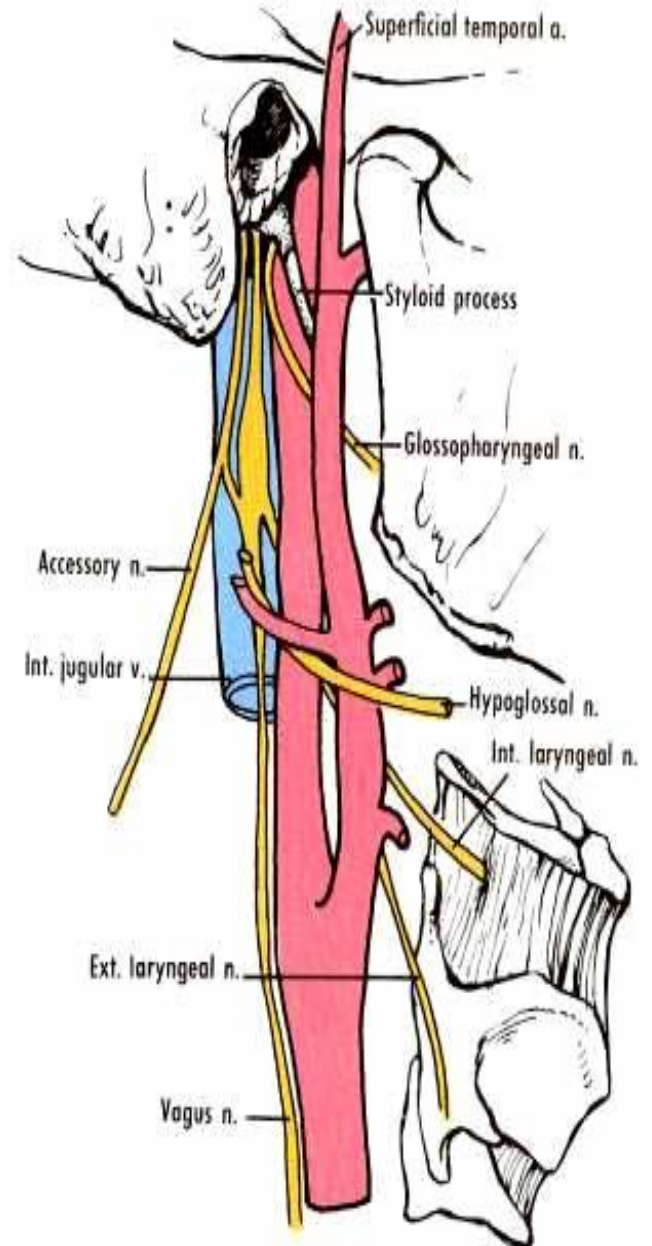


Vagus nerve is joined by cranial part of accessory nerve, which is distributed through its pharyngeal and recurrent laryngeal branches.

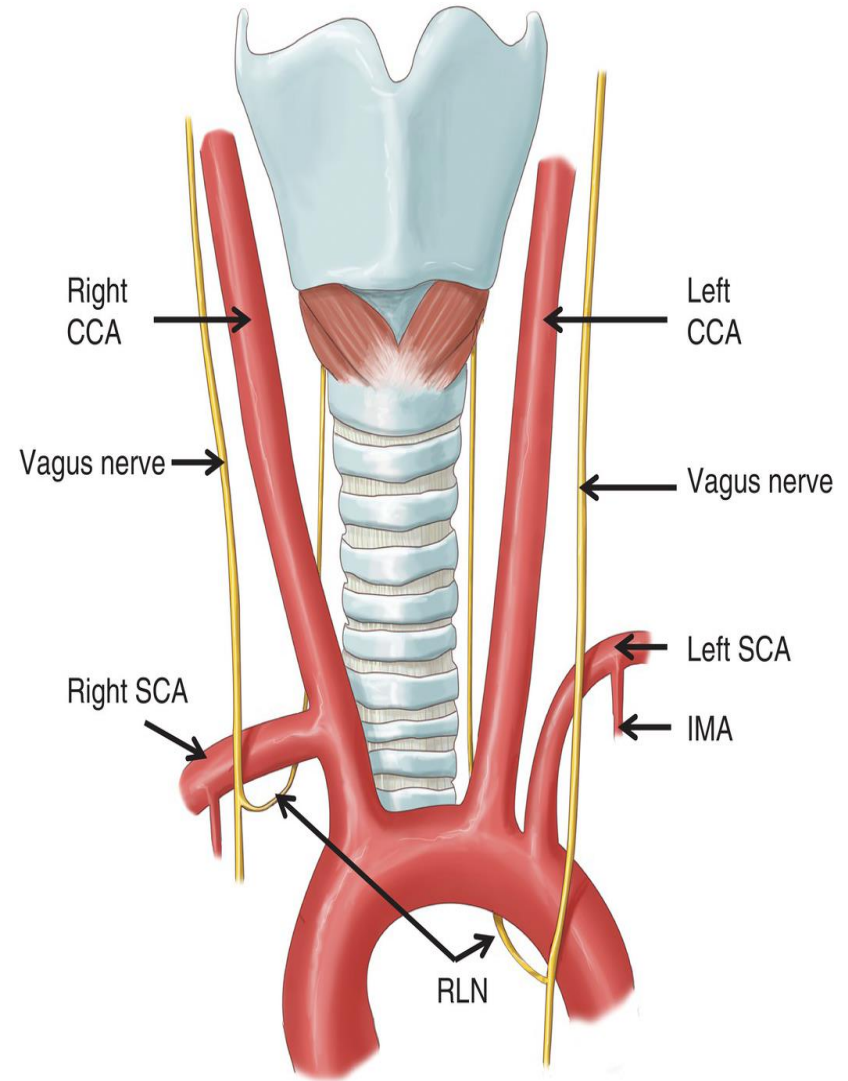


Vagus nerve

- Pass vertically down
- Between IJV & ICA
- Between IJV & CCA



Vagus crosses **Rt subclavian** artery to enter thorax (on Rt. Side),
but passes between **Lt. subclavian artery & Lt. C.C.A.** to enter thorax (on left. side).

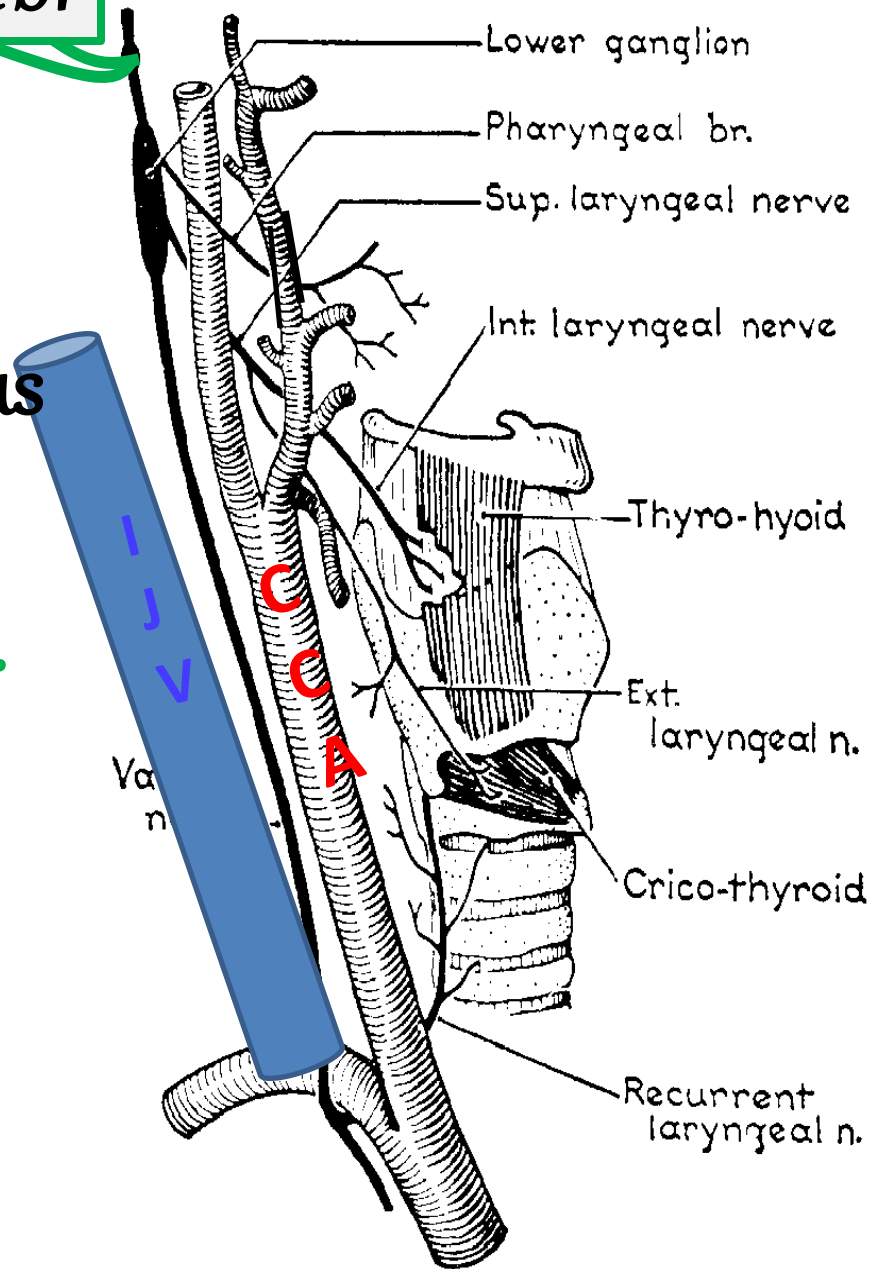


Meningeal br

Auricular
br

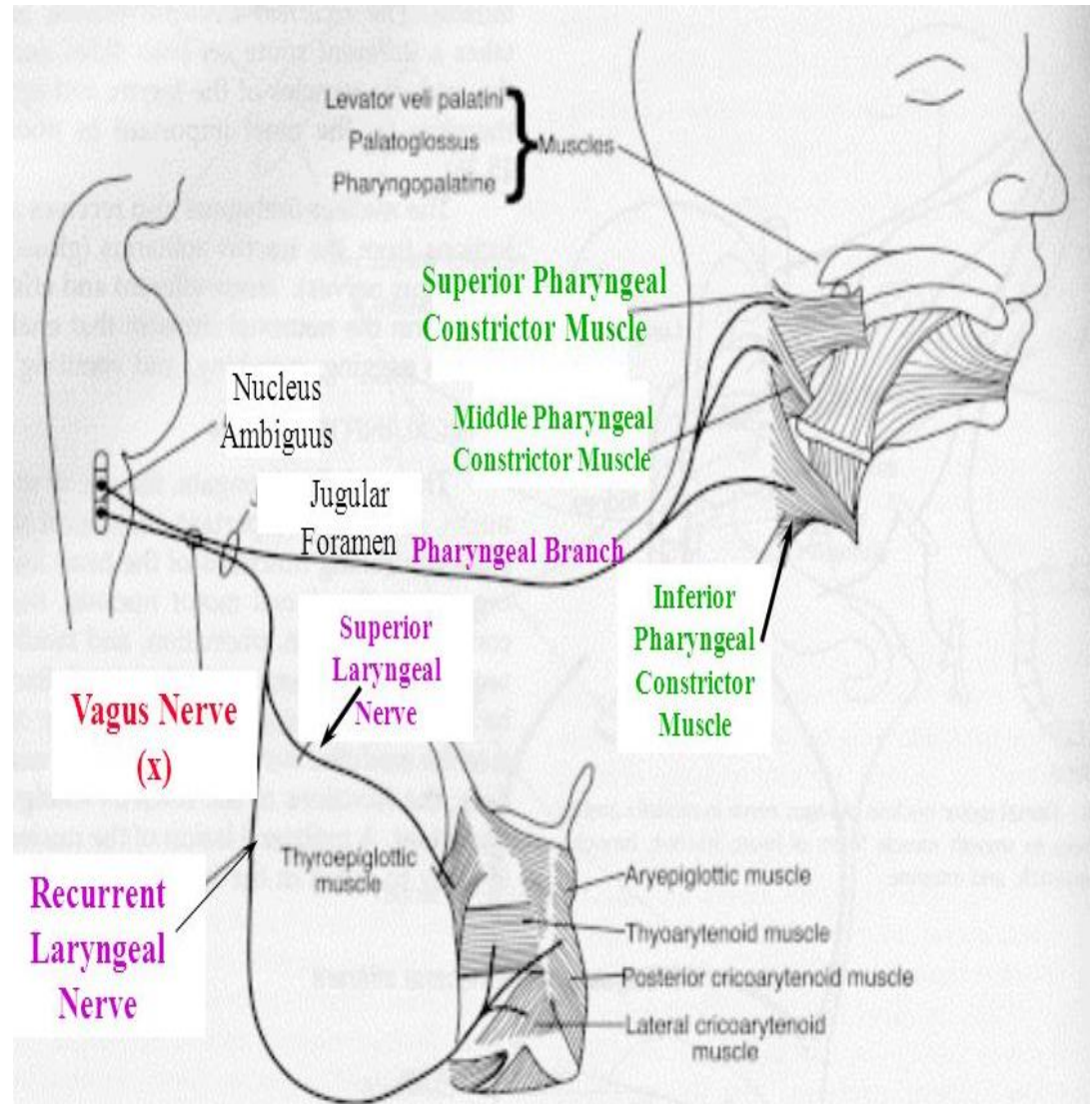
Branches of vagus
nerve:

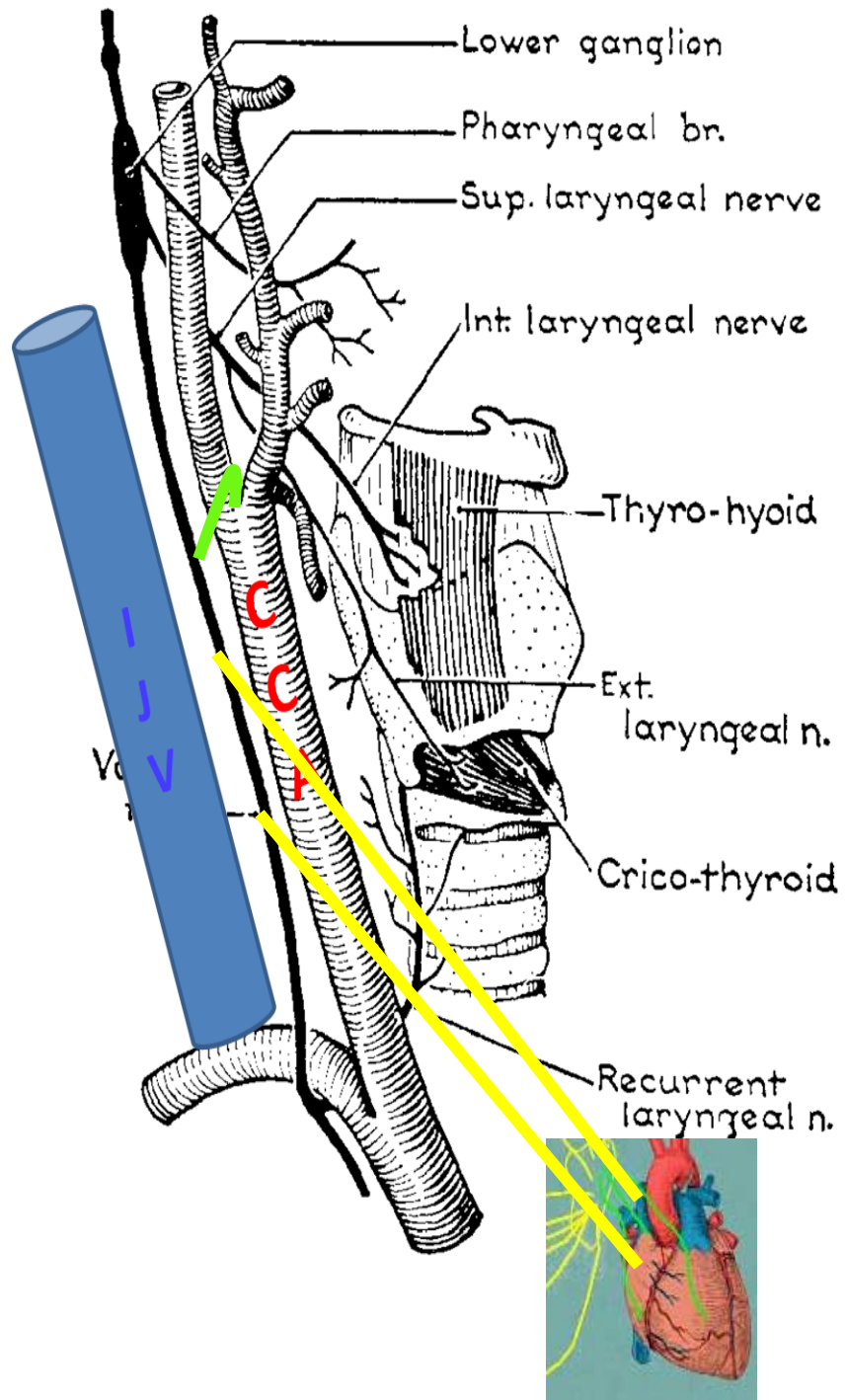
- 1- Meningeal br.
- 2- Auricular br.



3-Pharyngeal nerve: reach middle constrictor to share in pharyngeal plexus.

4-Superior laryngeal nerve: it divides into 2 branches: External laryngeal n. & Internal laryngeal n.,

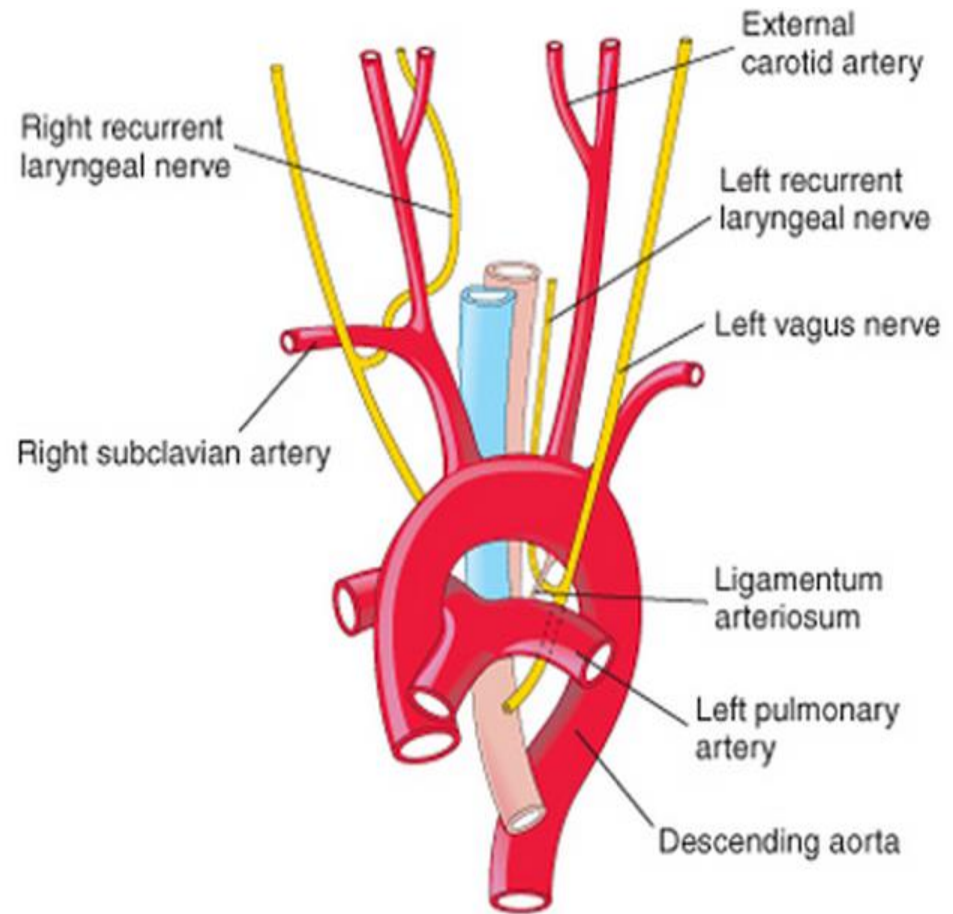




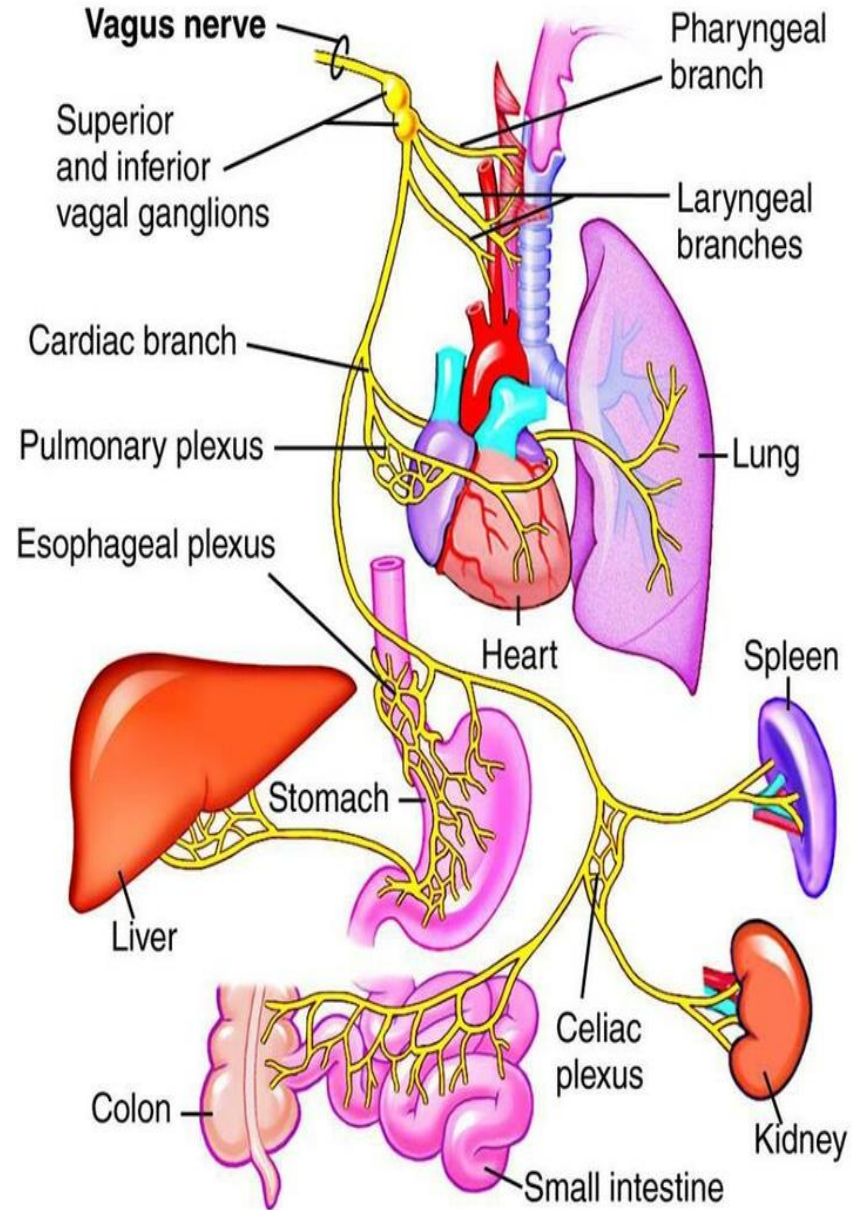
5-2 cardiac branches

6-Br to carotid body

- **Recurrent laryngeal nerves**
 - Right one arise in neck & hooks around right subclavian artery, left one hooks around aortic arch
 - Both ascend in tracheo-esophageal groove
 - Nerves enter larynx
- **Pulmonary & cardiac branches**



Vagus n enters abdomen to supply abdominal viscera till junction of right 2/3 with left 1/3 of transverse colon

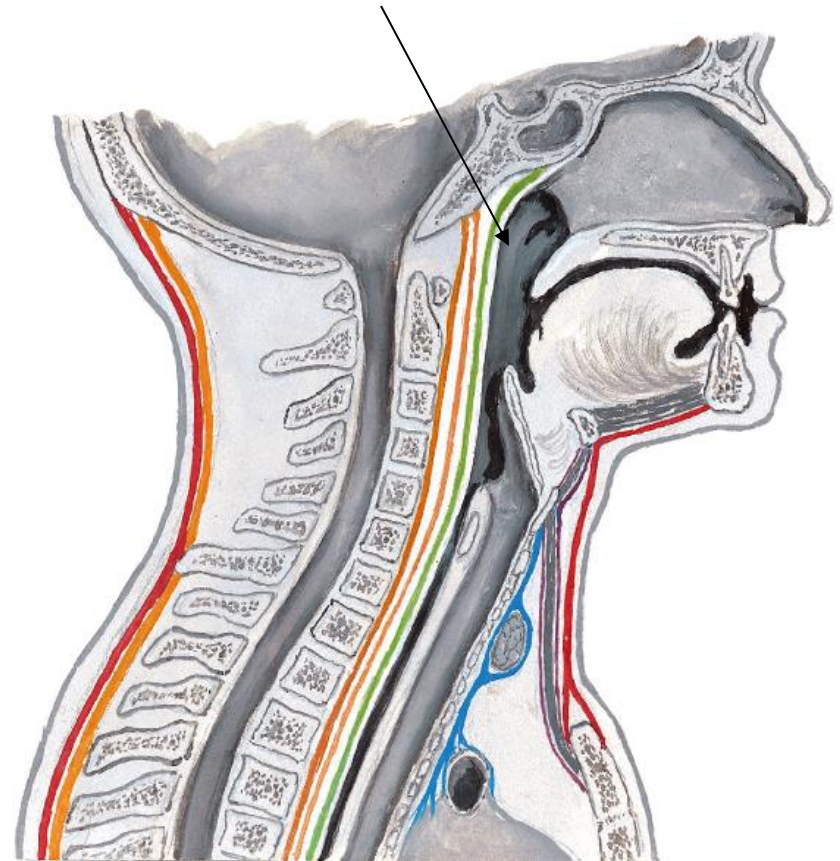


Pharynx

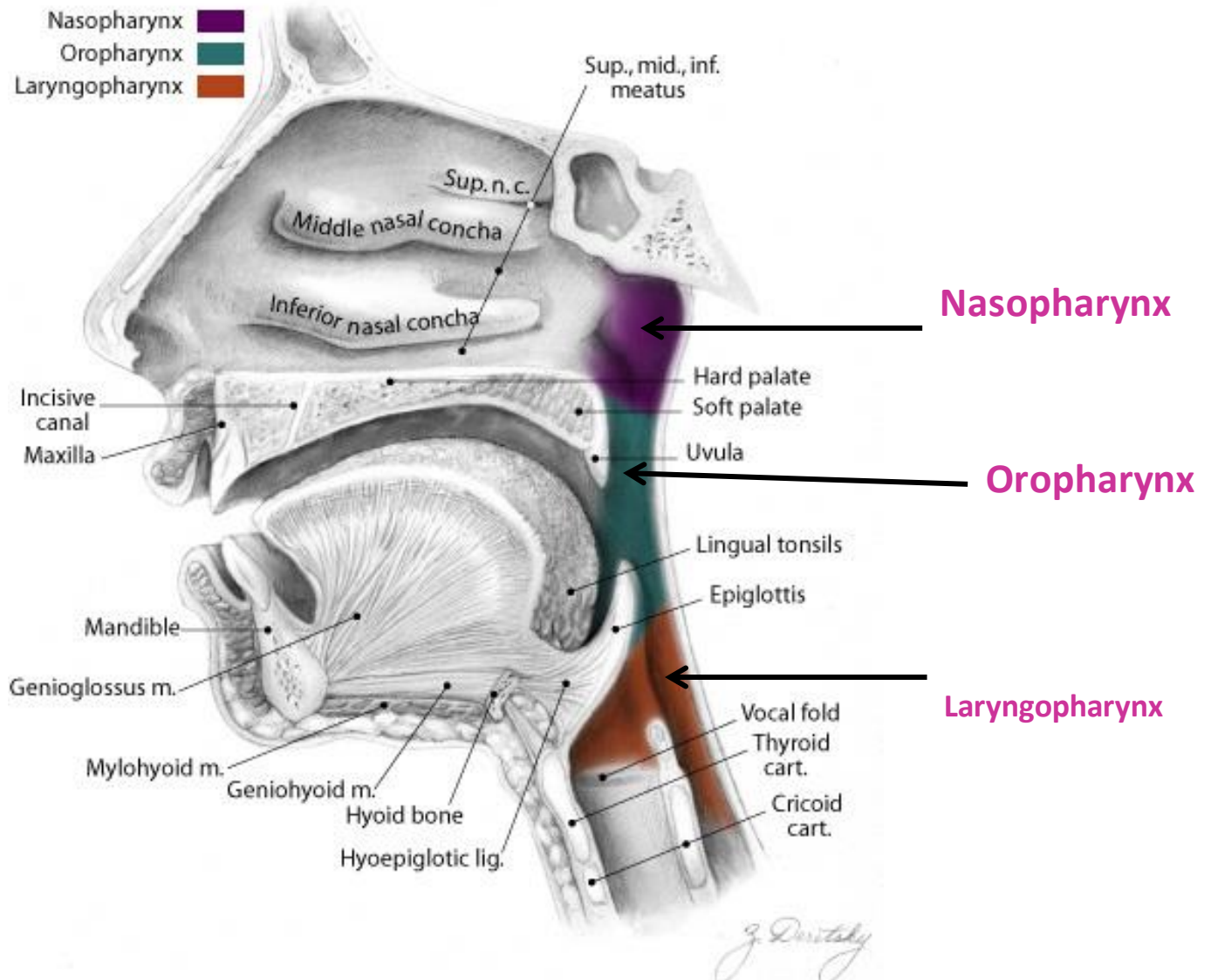
- A muscular tube extending from the **base of skull** to the lower border of **cricoid cartilage** (6 cervical vert.)
- It lacks the presence of anterior wall
- Length : 5 inches

Relations

- Ant: nose , oral cavity & larynx
- Posterior : vertebral column
- Lateral : common carotid , internal & external carotid
- Superior: base of skull
- Inferior : esophagus



Pharynx is divided into nasopharynx, oropharynx & laryngopharynx

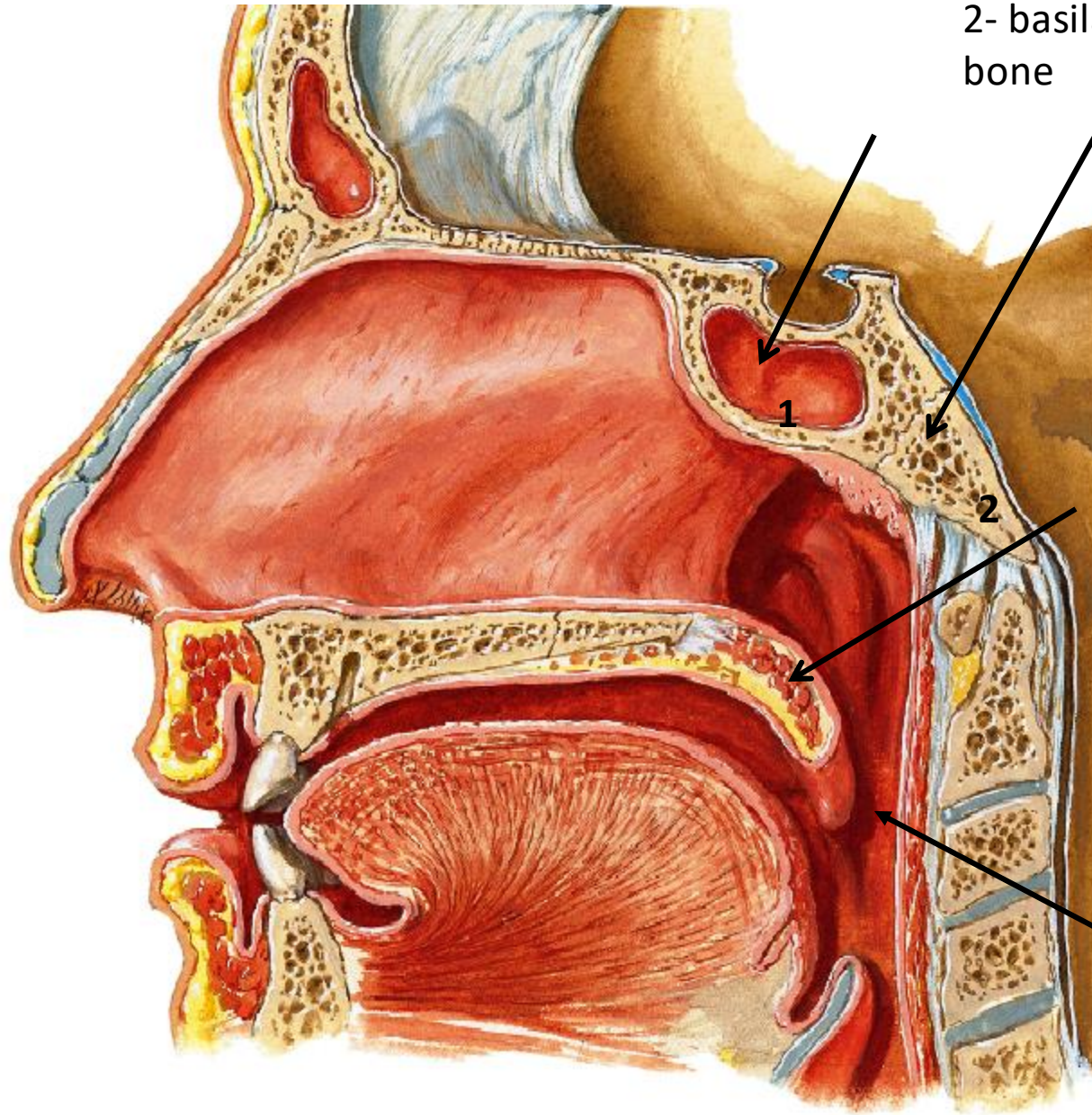


Nasopharynx

- **It lies behind nasal cavities**
- **Roof:** Body of sphenoid and basilar part of occipital bone
- **Floor** :Soft palate
- It communicates anteriorly with nasal cavity.
- It communicates inferiorly with oropharynx through **pharyngeal isthmus which lies between posterior wall of pharynx and soft palate**

Base of skull

1-Body of sphenoid
2- basilar part of occipital bone

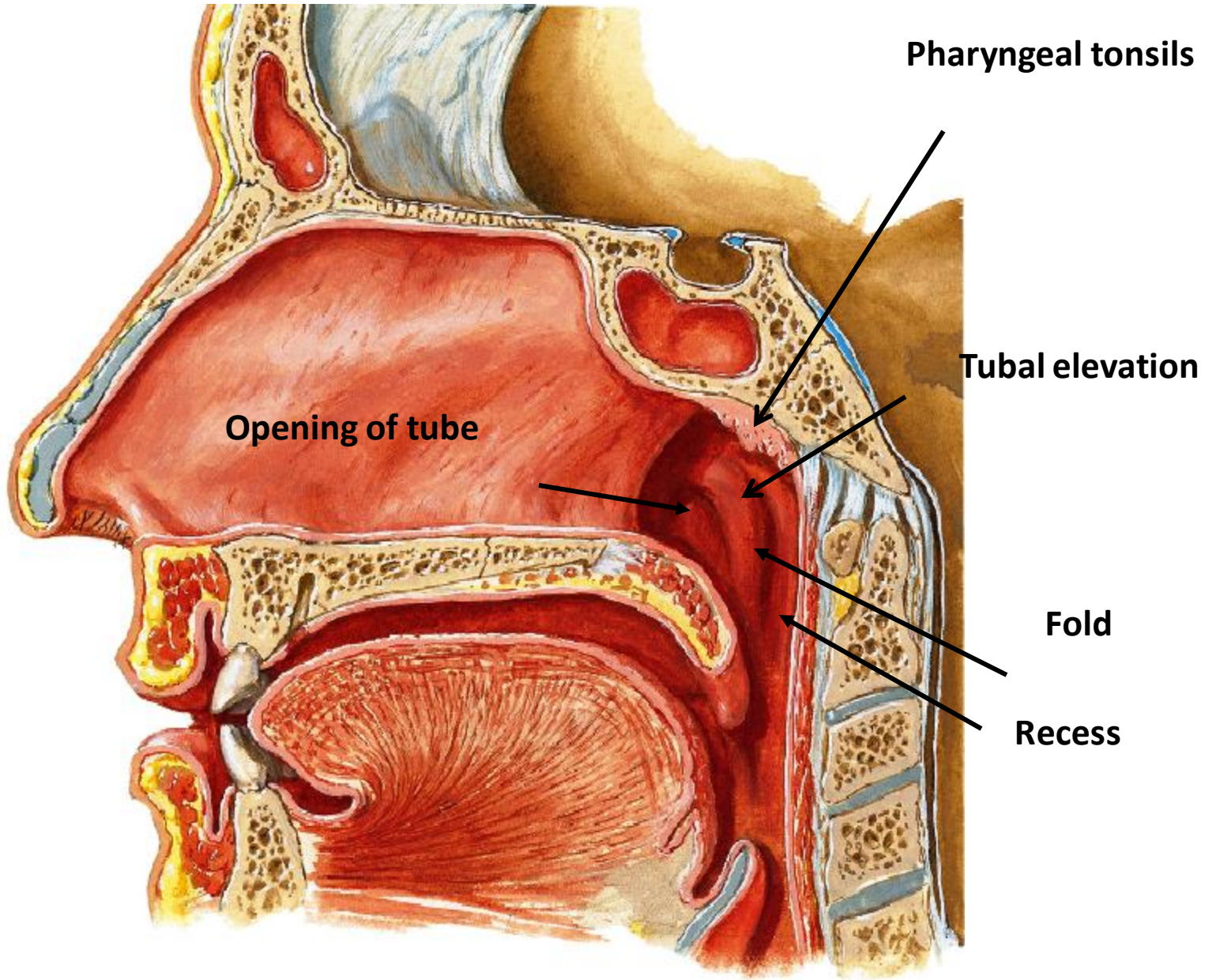


Soft palate

Pharyngeal isthmus

Features of Nasopharynx

- **Pharyngeal tonsils**: aggregations of lymphoid tissue at roof , atrophies with age if enlarged it is called adenoids it obstructs posterior nasal openings& causes oral breathing & over crowding of teeth
- **Opening of auditory tube**: in lateral wall
- **Tubal elevation**: formed by posterior margin of auditory tube
- **Salpingopharyngeal fold** : extends from the tubal elevation containing salpingopharyngeal muscle
- **Pharyngeal recess**: behind the tubal elevation it is related to internal carotid artery
- **Tubal tonsil**: lymphoid tissue around opening of auditory tube



Pharyngeal tonsils

Tubal elevation

Opening of tube

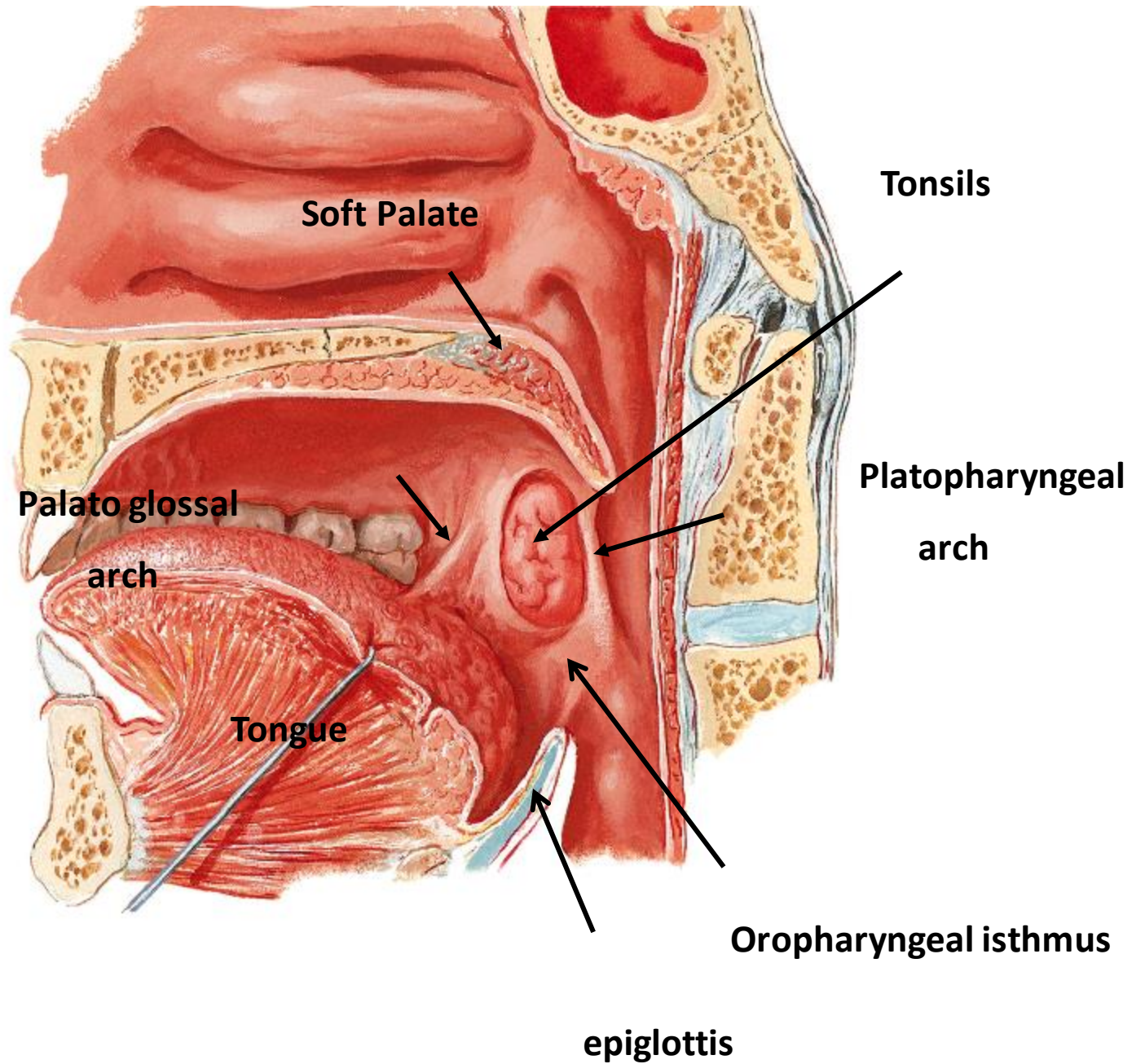
Fold

Recess

Oropharynx

Lies behind oral cavity

- Roof: soft palate
- Floor: posterior part of tongue
- Anterior wall: absent it communicates with oral cavity via oropharyngeal isthmus
- Posterior wall: 2&3 cervical vertebrae
- Lateral wall: it shows palatoglossal and palatopharyngeal arches with palatine tonsils in between

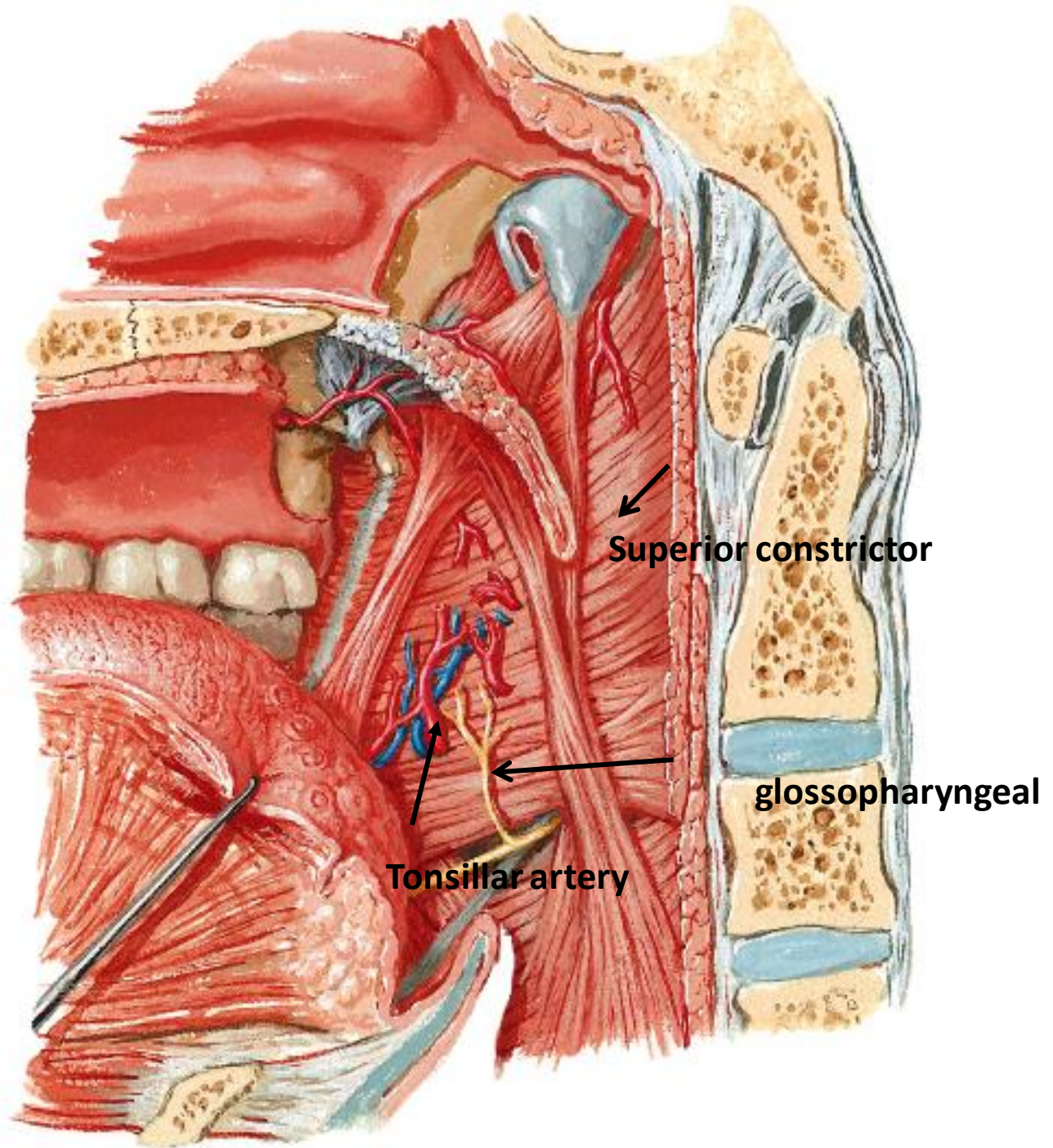


Palatine Tonsils

- **Lymphoid tissue in lateral wall of oropharynx oval in shape it has**
- **Anterior border** : related to palatoglossal arch
- **Posterior border**: related to palatopharyngeal arch
- **Upper pole**: related to soft palate
- **Lower pole** : related to tongue
- **Lateral surface**: has capsule& resting on tonsillar bed
- **Medial surface** : free surface which shows tonsillar crypts

Tonsillar bed:

1. Superior constrictor muscle
2. Styloglossus
3. Tonsillar artery & ascending palatine branches of facial artery
4. Glossopharyngeal nerve
5. Paratonsillar vein which causes bleeding after tonsillectomy



Superior constrictor

Tonsillar artery

glossopharyngeal

Blood Supply

- Tonsillar artery, from facial main supply
- Dorsal Lingual artery
- Greater palatine
- Ascending palatine
- Ascending pharyngeal

Venous drainage : paratonsillar vein & pharyngeal vein & facial vein

Lymph drainage: juglodiagatric

Nerve supply : tonsillar branch of >>>>>>>

Laryngopharynx

It extends from epiglottis to lower border of cricoid cartilage

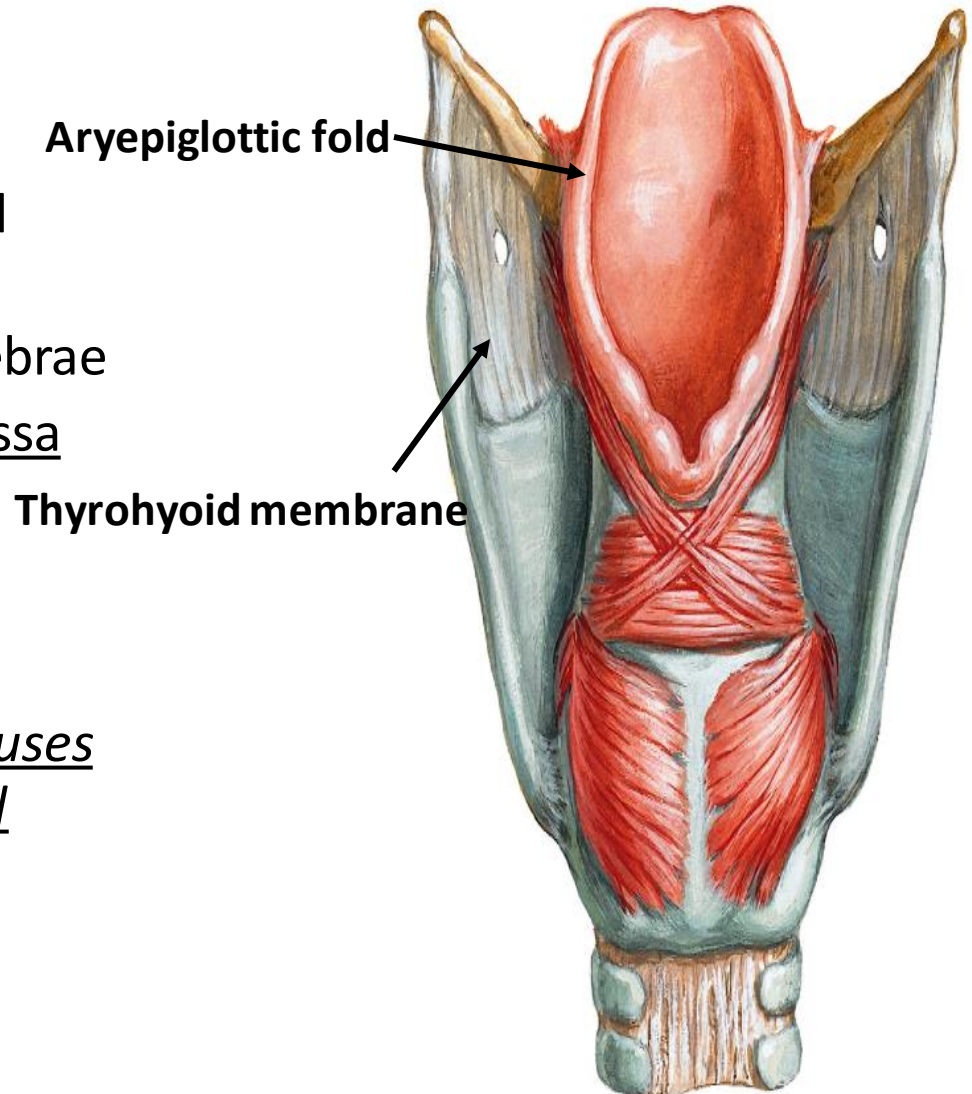
- **Anterior wall**: inlet of larynx and cricoid cartilage
- **Posterior wall**: 3-6 cervical vertebrae
- **Lateral wall**: it shows piriform fossa

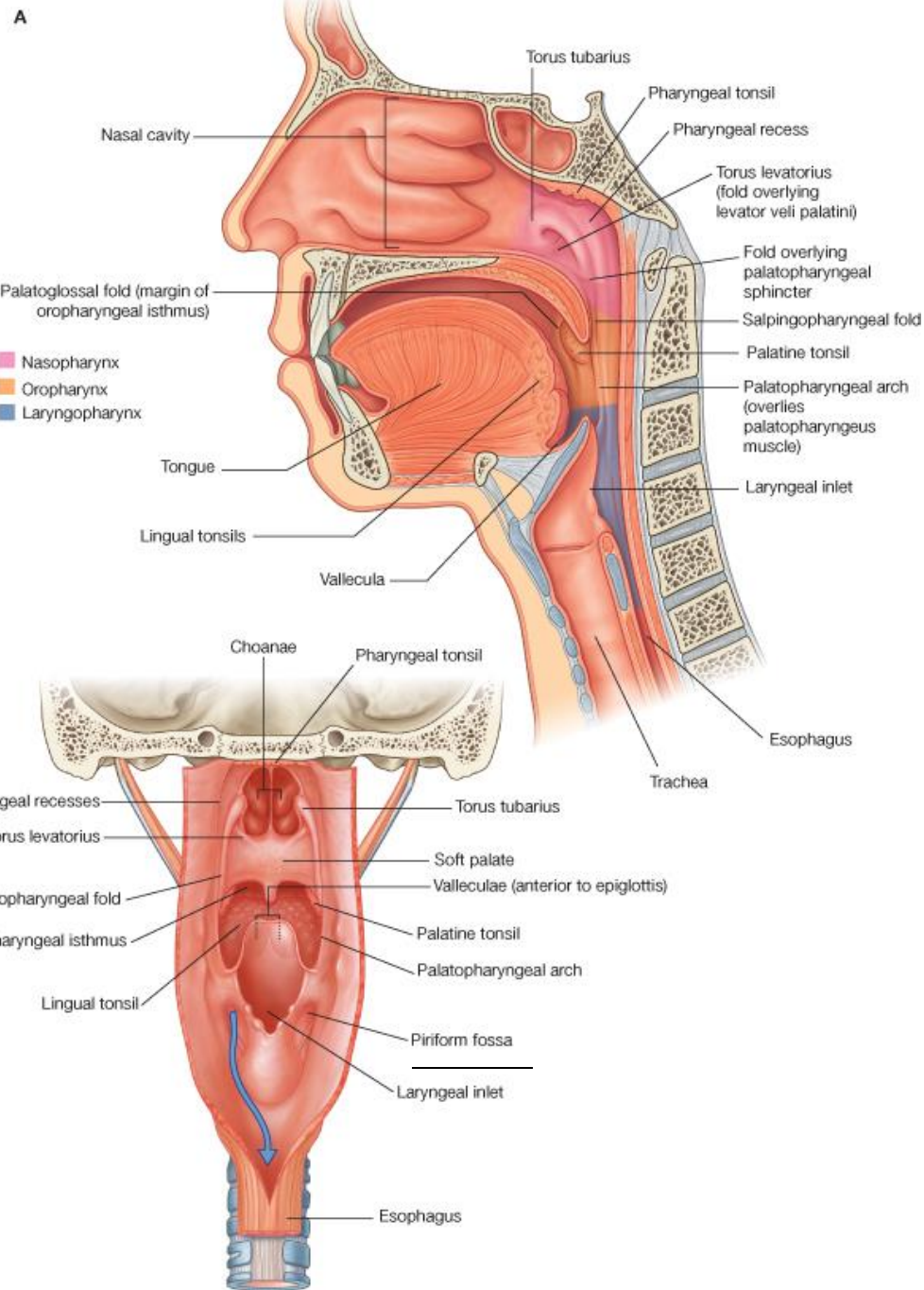
Piriform fossa

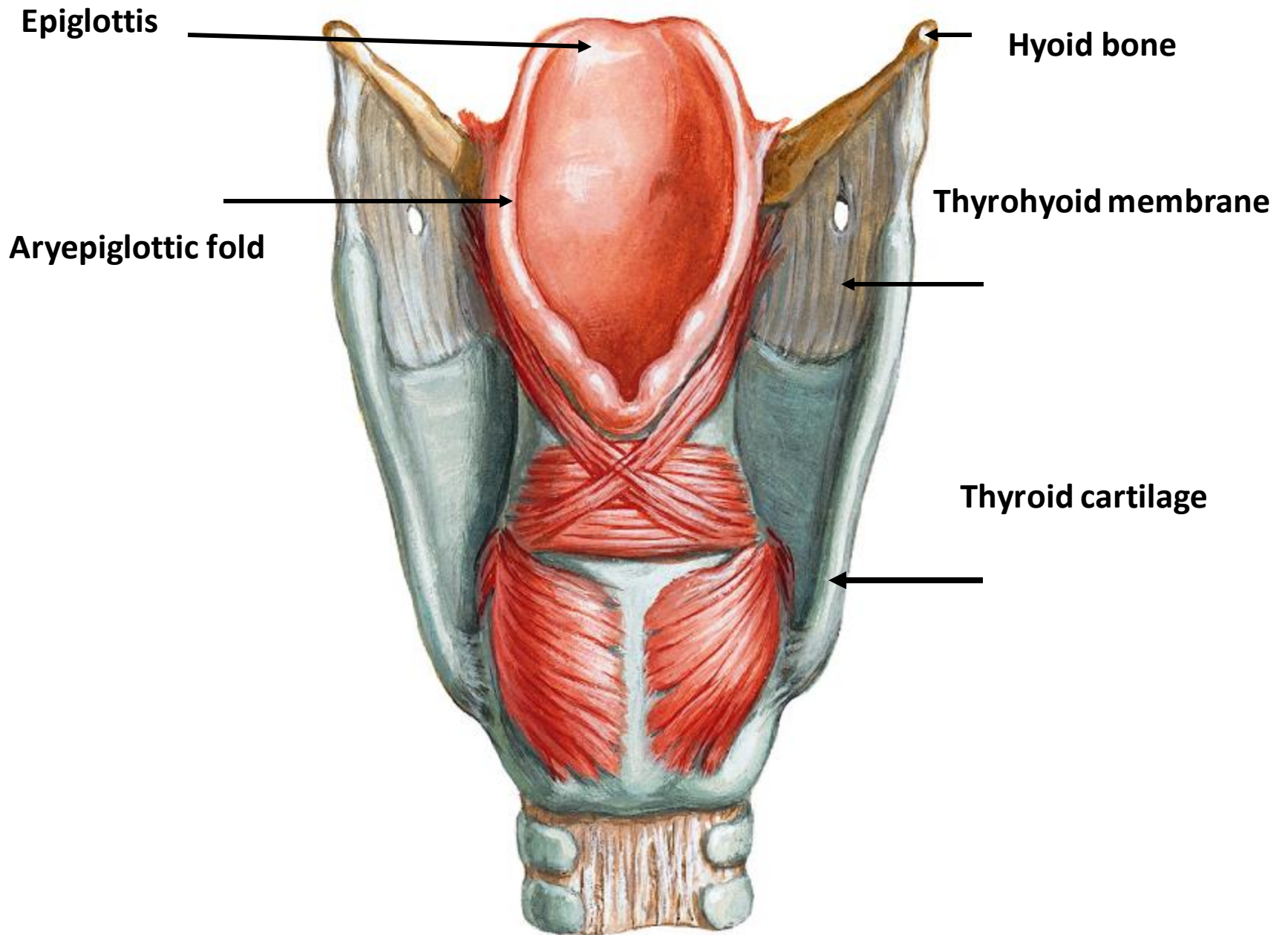
Medial : aryepiglottic fold

Lateral : thyrohyoid membrane

Site of foreign body impact that causes cough due to irritation of internal laryngeal nerve

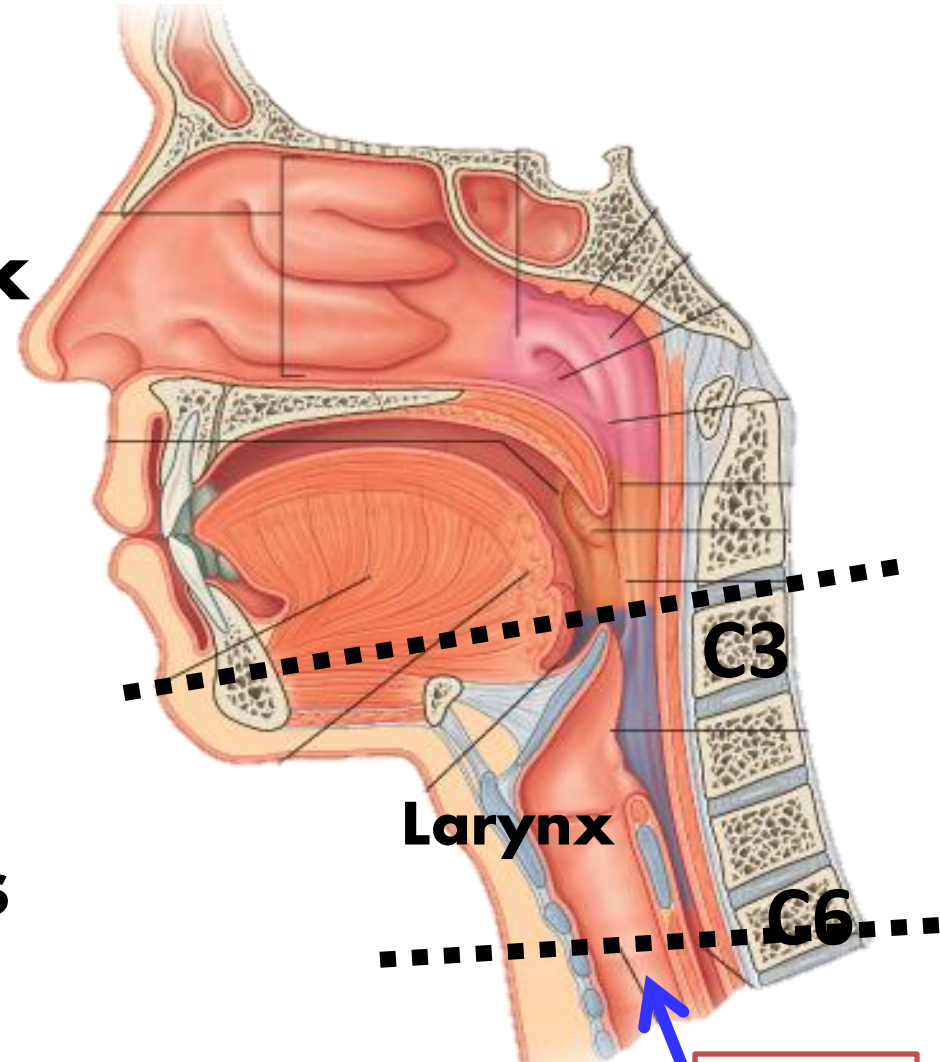






Larynx

- ❑ Lies in midline of neck
- ❑ extending from Epiglottis (root of tongue)
- ❑ to (lower border of cricoid cartilage = C₆)
- ❑ where it Continues as **Trachea**



Larynx

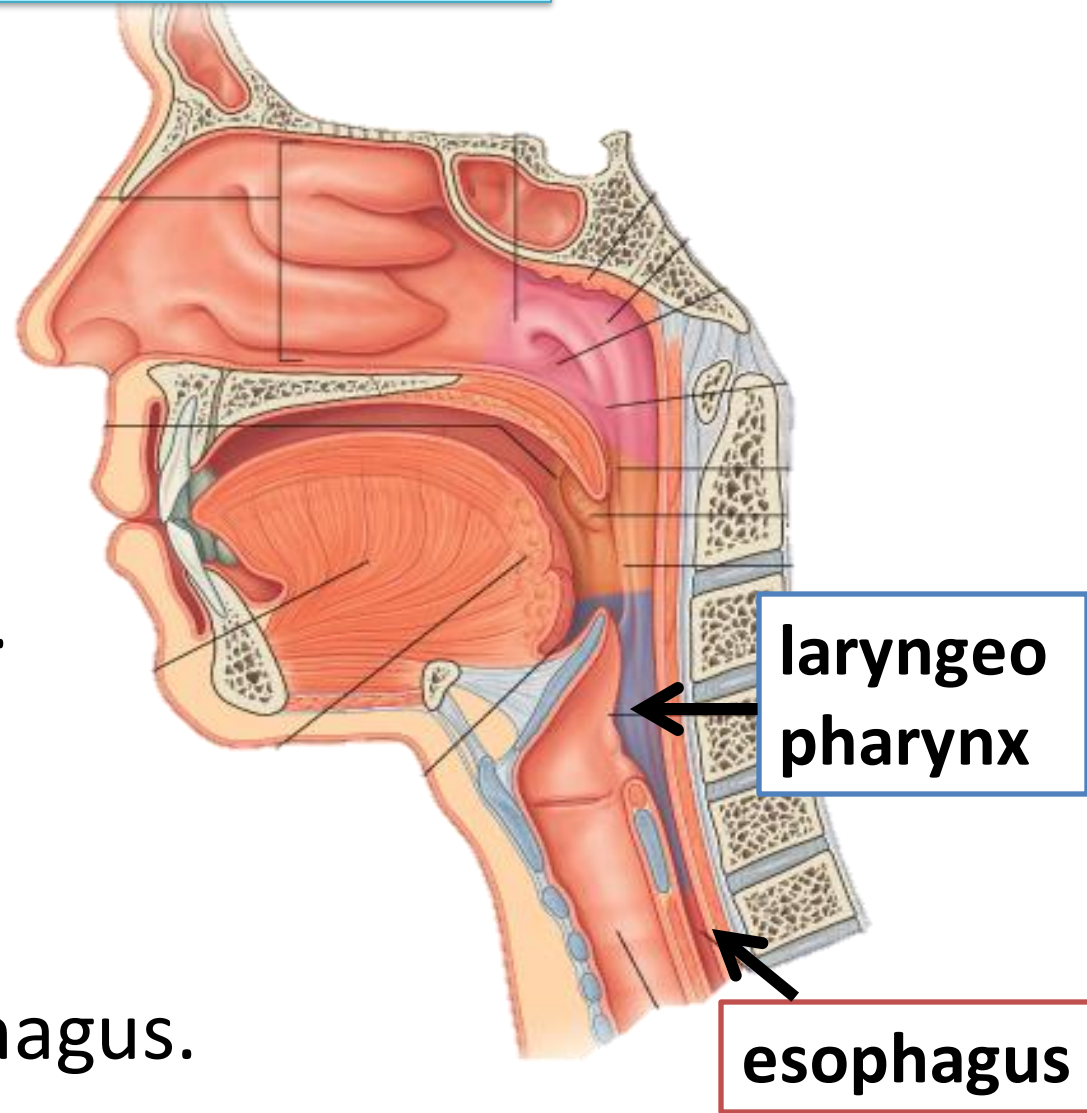
Relations:

Anteriorly:

- Skin
- Superficial fascia
- deep fascia
- infrahyoid muscles.

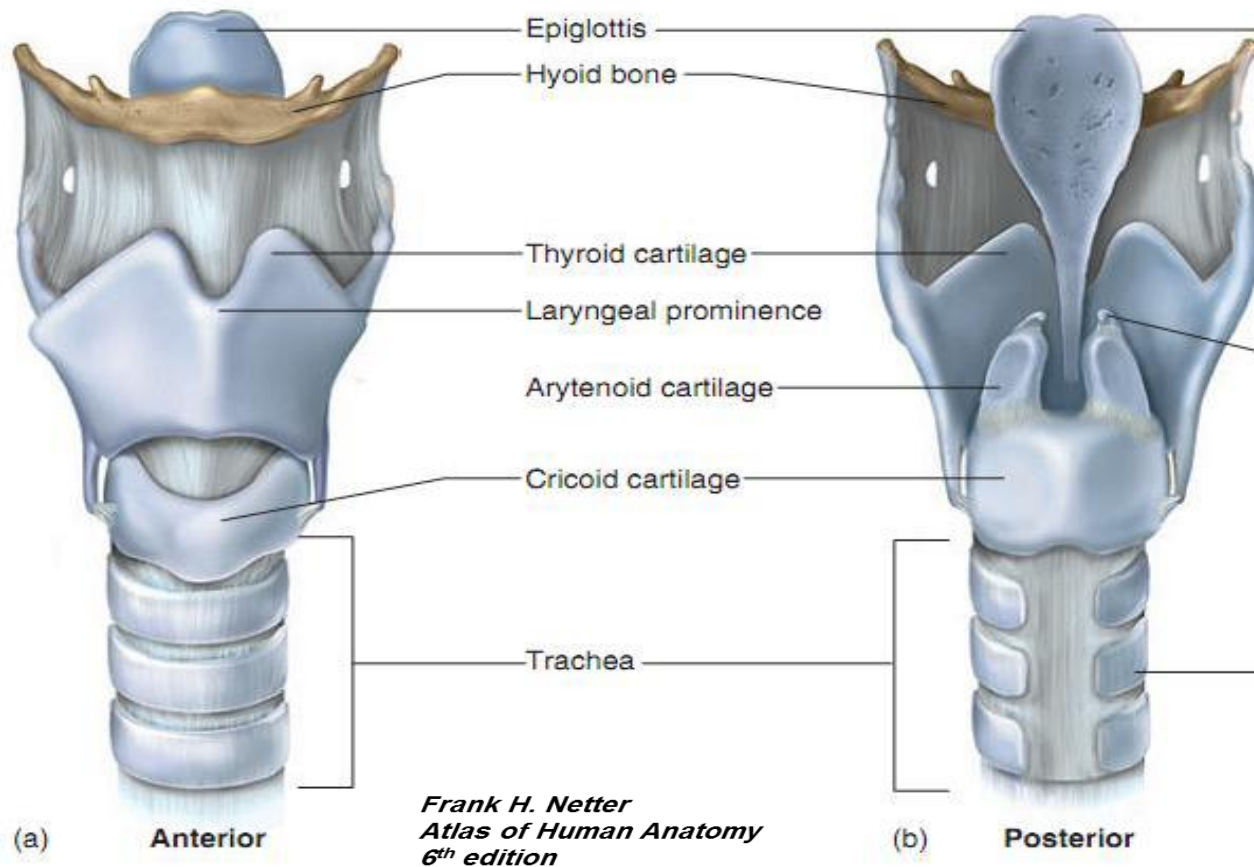
Posteriorly:

- laryngeal pharynx
- upper part of esophagus.



Larynx

Cartilages of the larynx



*Frank H. Netter
Atlas of Human Anatomy
6th edition*

Larynx

Cartilages of the larynx

Single:
3

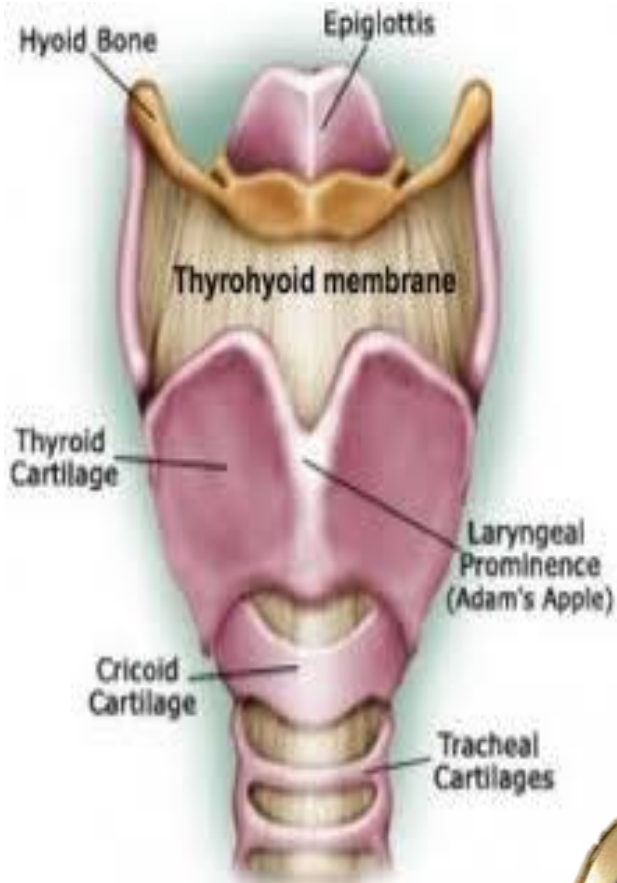
Paired :
3



- Epiglottis
- Thyroid cartilage
- cricoid cartilage

- Arytenoid
- Corniculate
- cuneiform.

Single Cartilages of the larynx

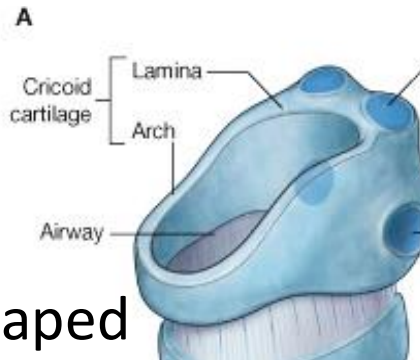


laryngeal prominence



Thyroid Cartilage

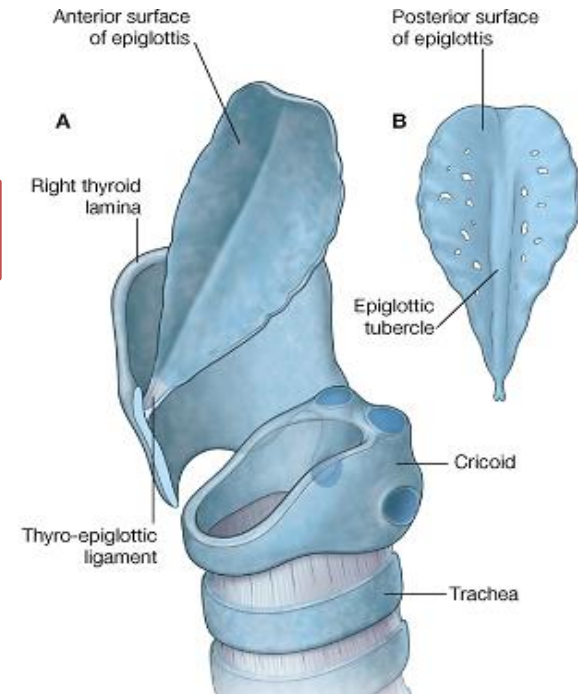
Signet ring shaped



Cricoid cartilage

Epiglottis

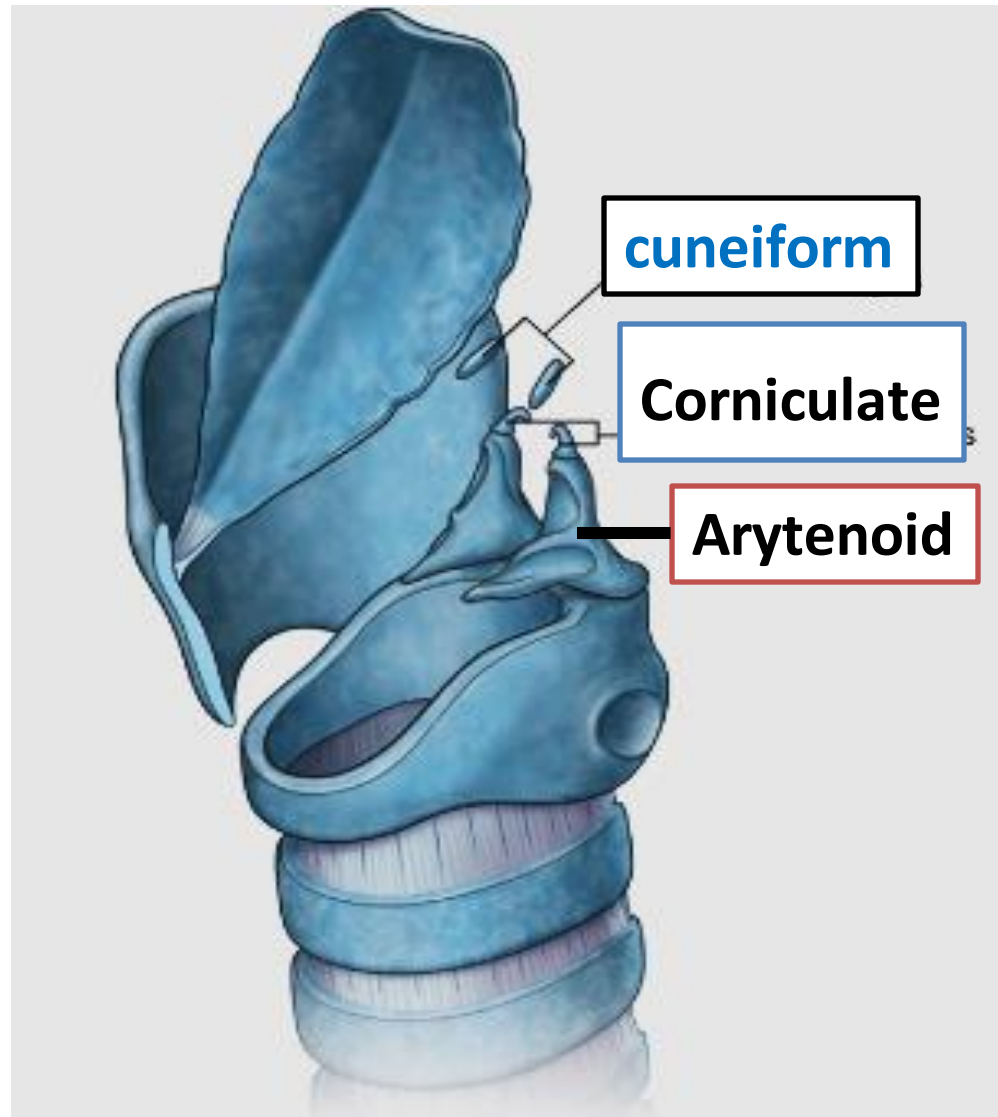
Leaf shaped
midline cartilage



Paired :

3

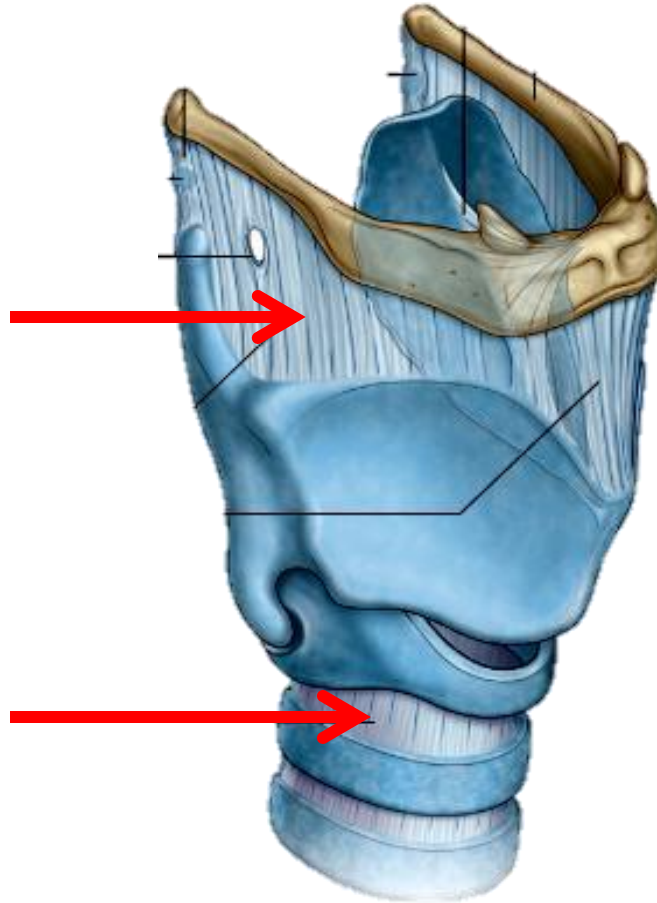
- ❑ Arytenoid
- ❑ Corniculate
- ❑ cuneiform.



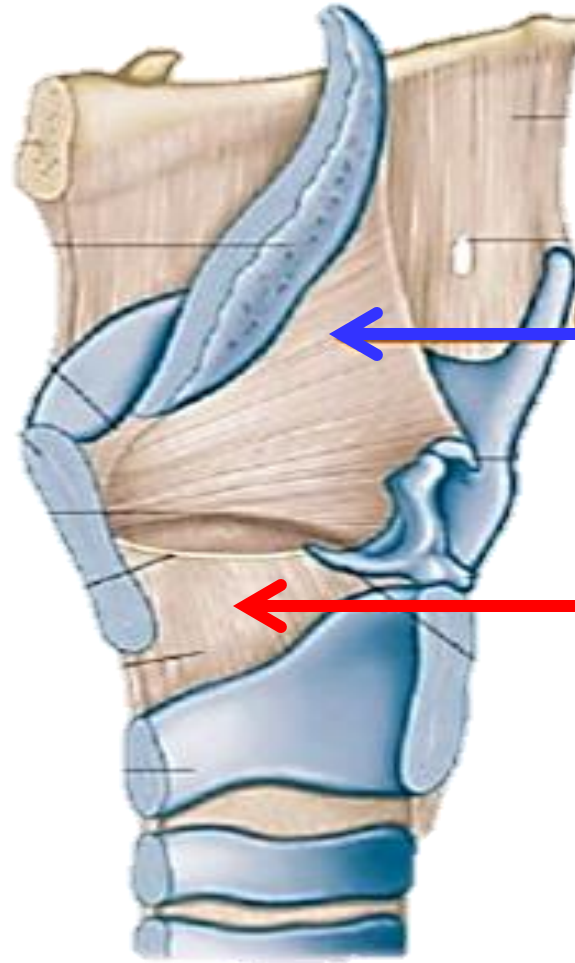
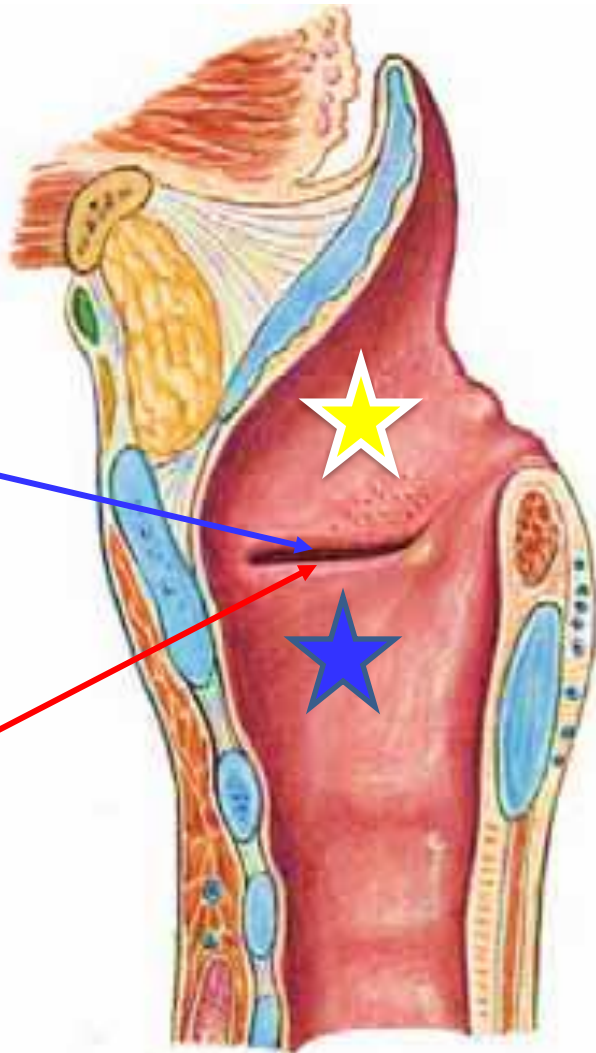
Extrinsic ligaments:

1- Thyro-
hyoid
membrane

2- Crico-
tracheal
ligament



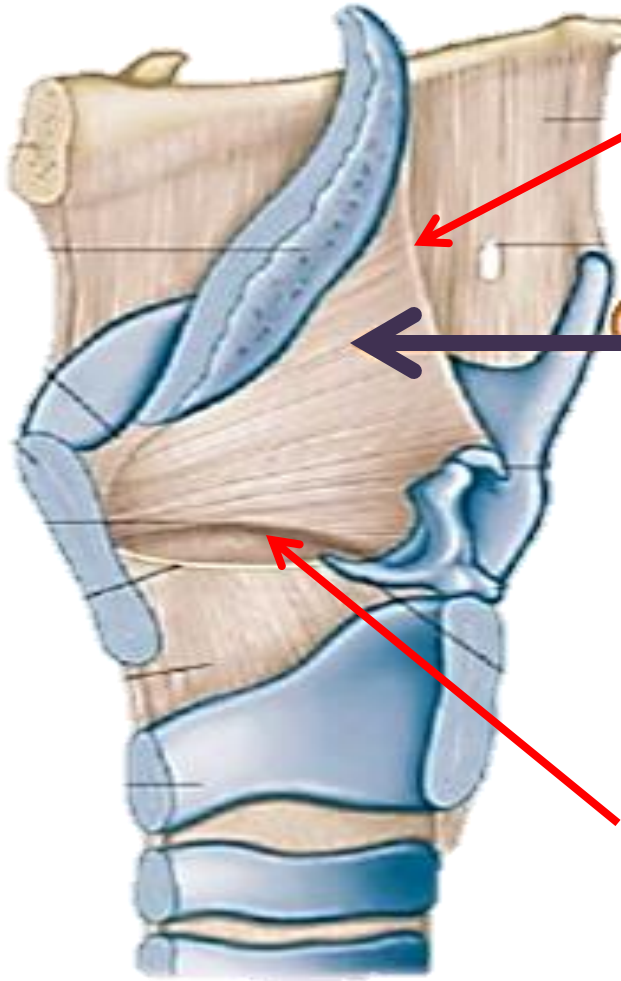
Intrinsic ligaments:



**Quadrangular
membrane**

**Cricothyroid
membrane**

Intrinsic ligaments:



- The free upper margin form **Aryepiglottic fold**

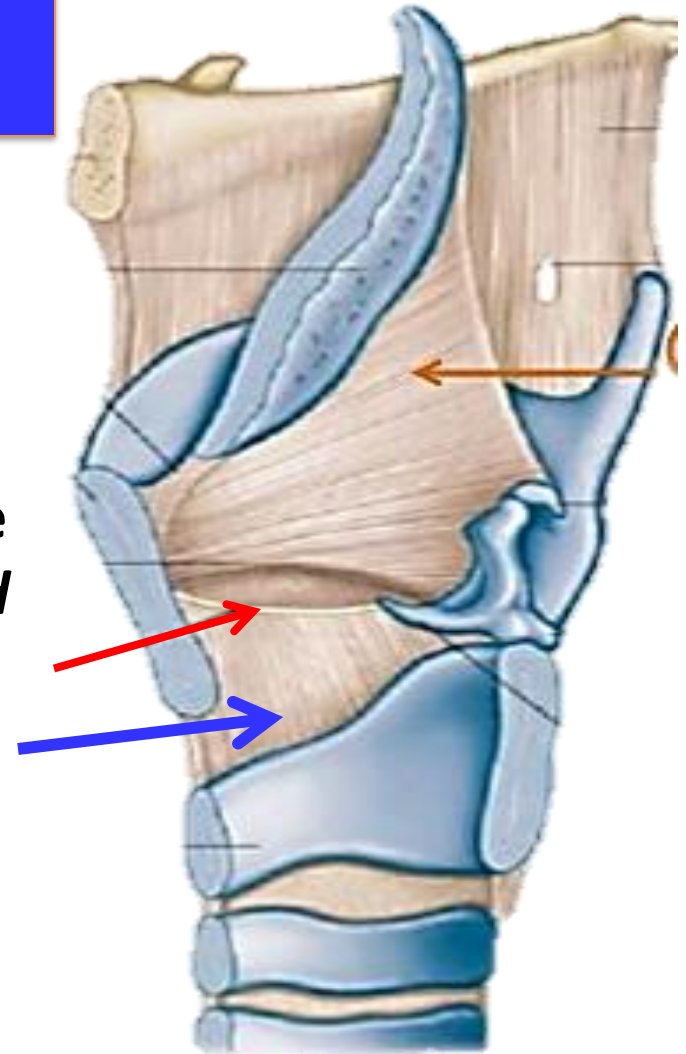
quadrangular membrane

- It extends between **epiglottis**
- to **arytenoid** and **corniculate** cartilage on the same side
- The free lower margin form the **vestibular ligament** under the **vestibular fold** (*false vocal cord*).

Intrinsic ligaments:

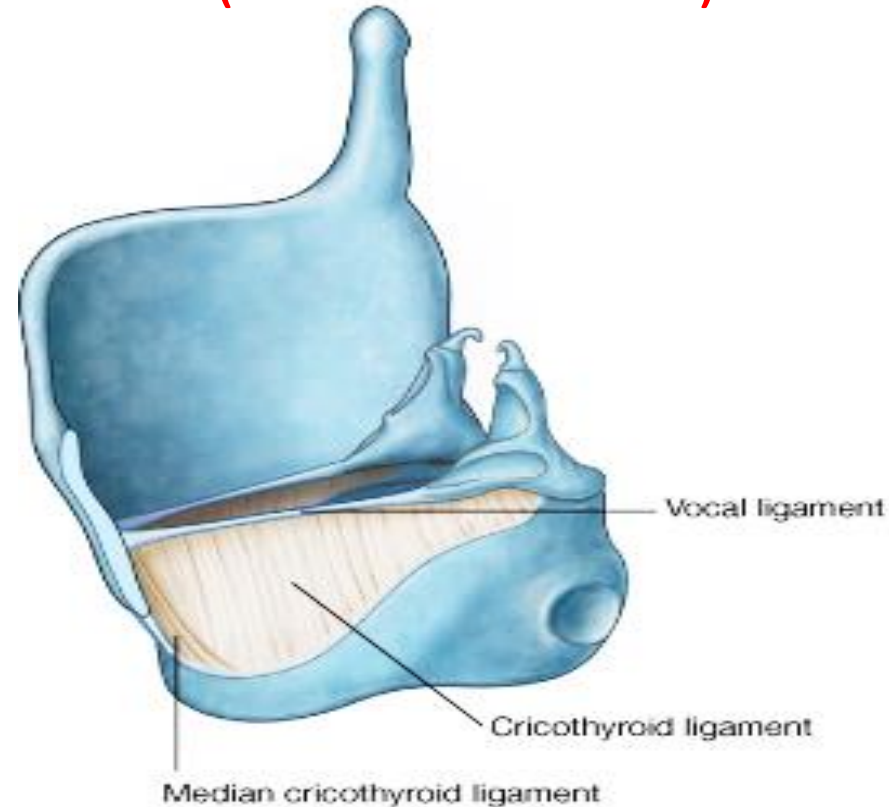
Cricothyroid Ligament

- ❑ It has a ***free upper margin*** which form → **vocal fold (true vocal cord)**
- ❑ It is attached to arch of cricoid cartilage
- ❑ Extented between ***thyroid cartilage and arytenoid cartilages (vocal processes)***

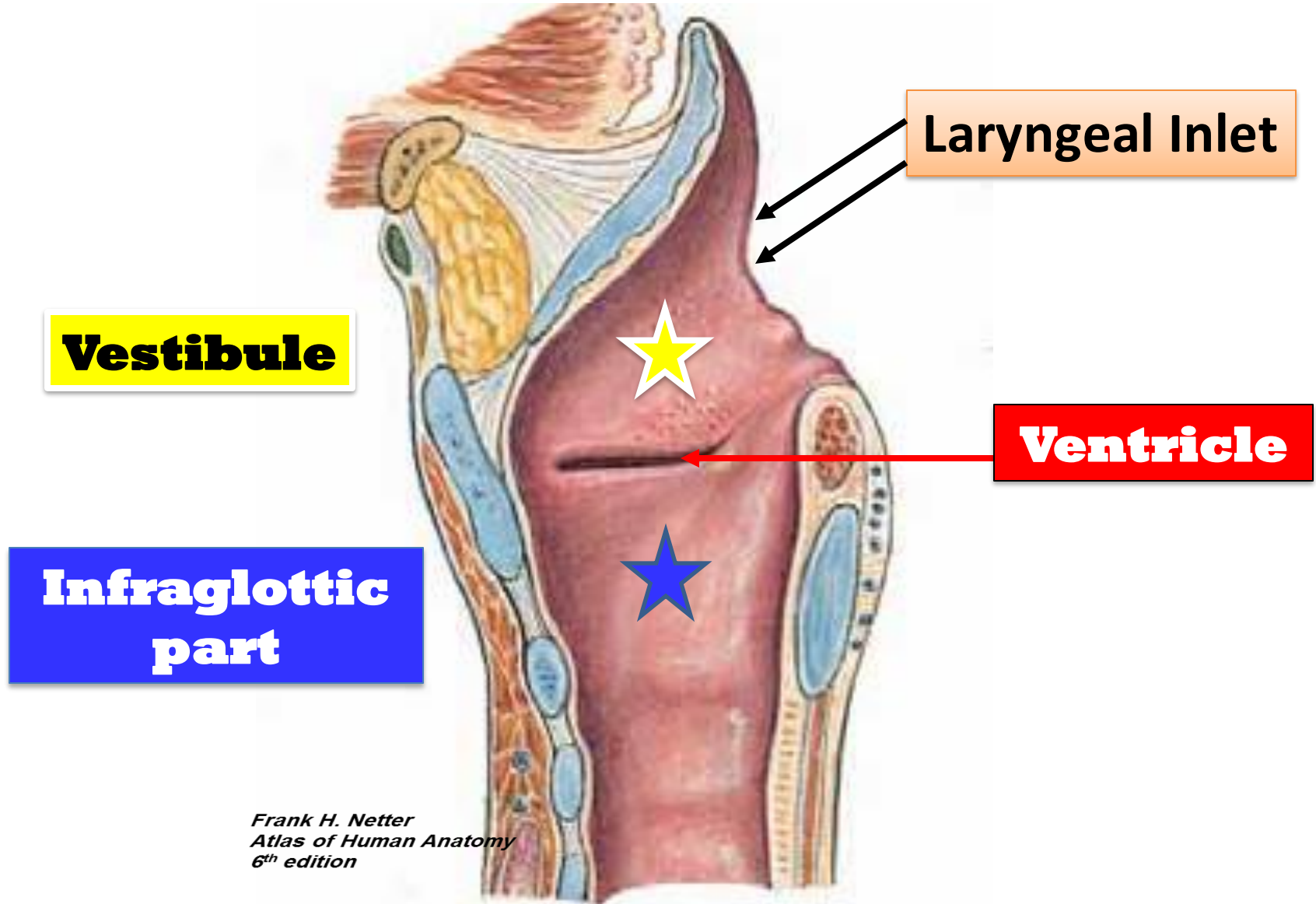


Intrinsic ligaments:

- Cricothyroid Ligament
free upper margin form →
vocal fold (**true vocal cord**)



Intrinsic features :



NERVE SUPPLY OF THE LARYNX

Vagus nerve

NERVE SUPPLY

Internal Laryngeal Nerve :

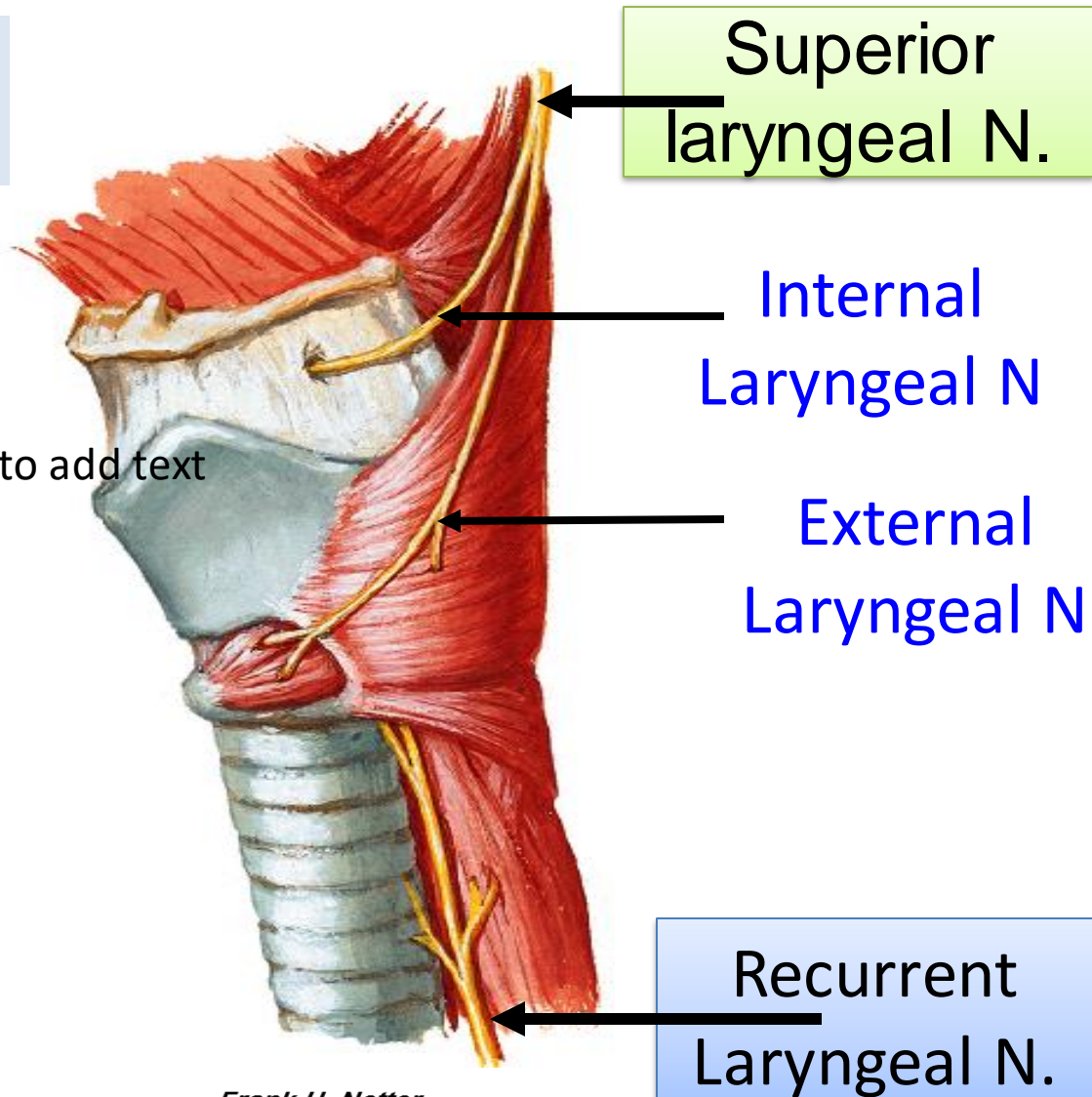
only sensory

External Laryngeal Nerve :

only motor

Recurrent Laryngeal Nerve : sensory and motor

Click to add text



NERVE SUPPLY OF THE LARYNX

Motor supply:

ALL laryngeal ms. → by **recurrent laryngeal n**
except *cricothyroid* → by **external laryngeal n**

Sensory supply:

the mucosa **Above Vocal Cords** is supplied by

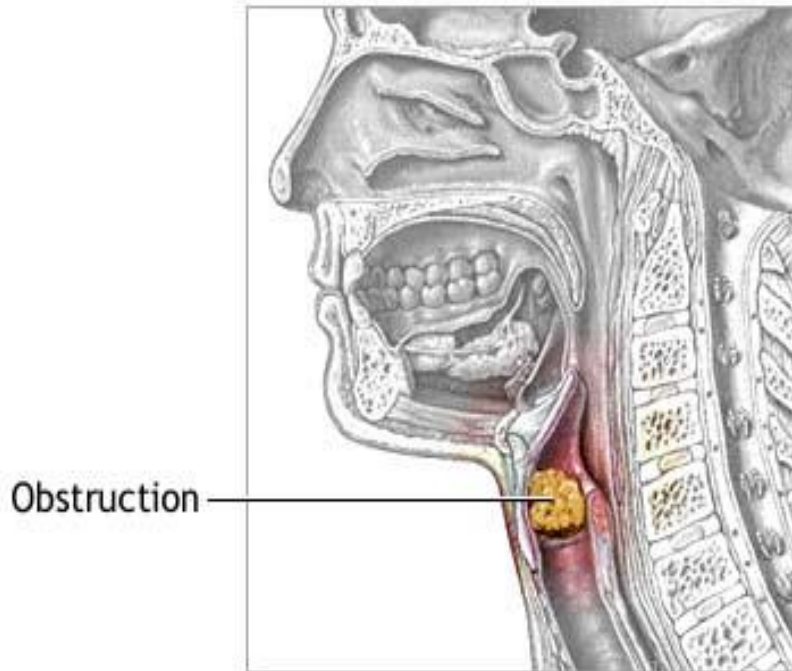
Internal Laryngeal Nerve

the mucosa **Below Vocal Cords** is supplied by

Recurrent Laryngeal Nerve.

What happen if a foreign body accidentally enters larynx ?

Universal sign
of choking



Quiz

If you ask a patient to protrude his tongue and it deviates to the left, this indicates injury of which of the following nerves?

- A. Left glossopharyngeal
- B. Right glossopharyngeal
- C. Left hypoglossal
- D. Right hypoglossal
- E. Left lingual



Thank you