STRIDOR

Harsh, high-pitched musical sound

Produced by turbulence of airflow through a partial obstruction in the airway passage

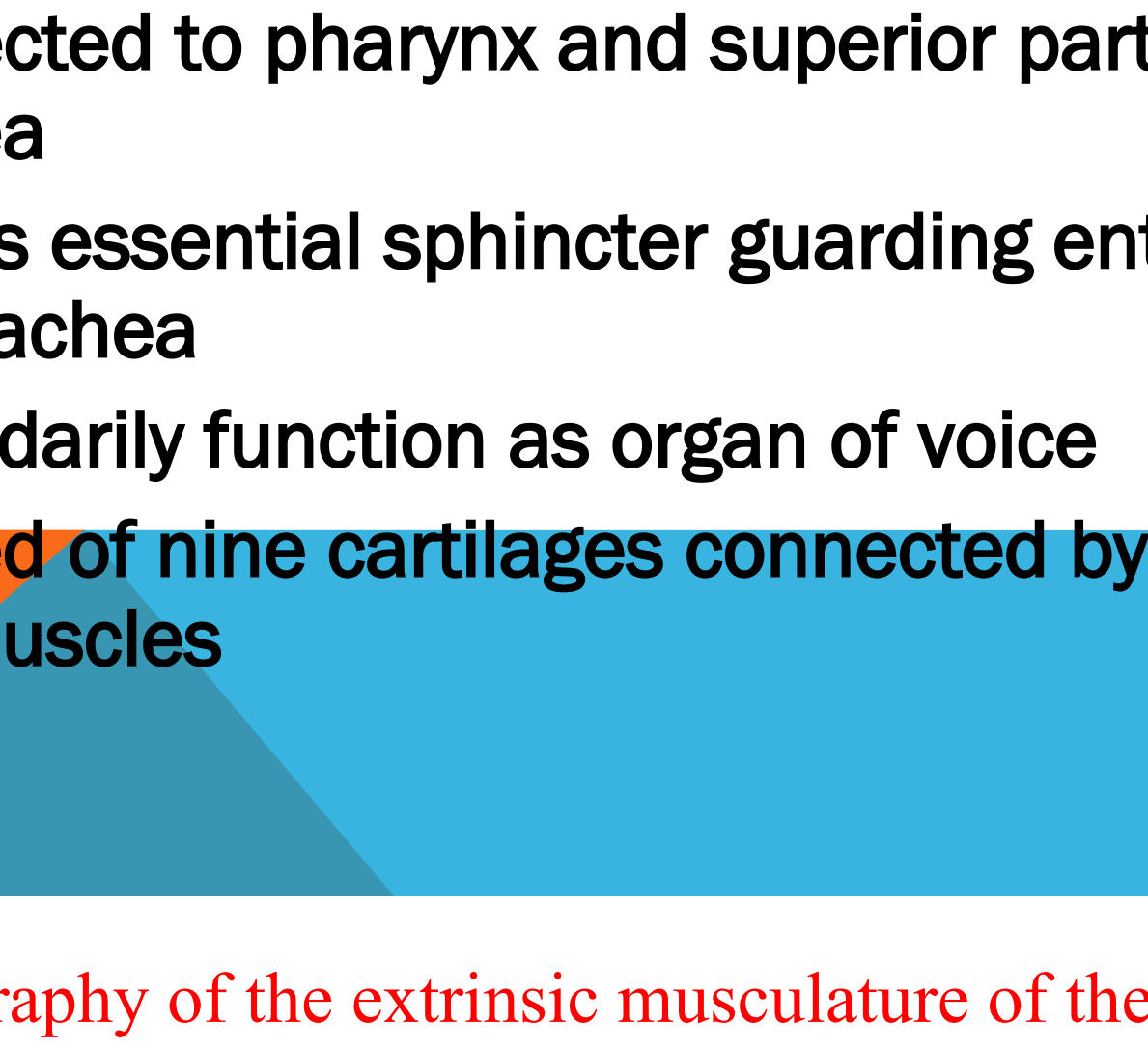
# ANATOMY OF LARYNX

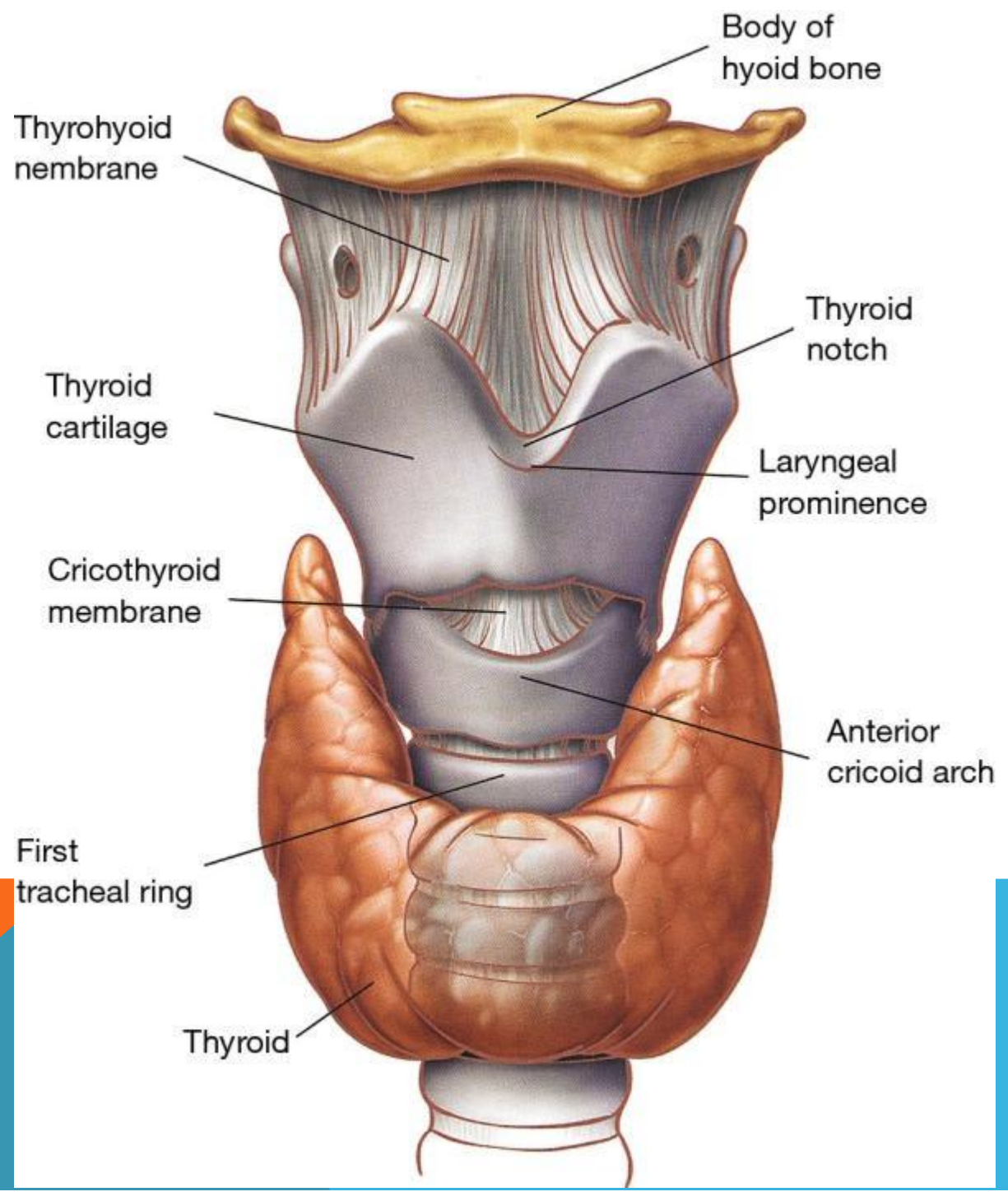
- Situated in midline of neck from the level of C-3 to C-6 vertebrae lying in front of laryngopharynx.

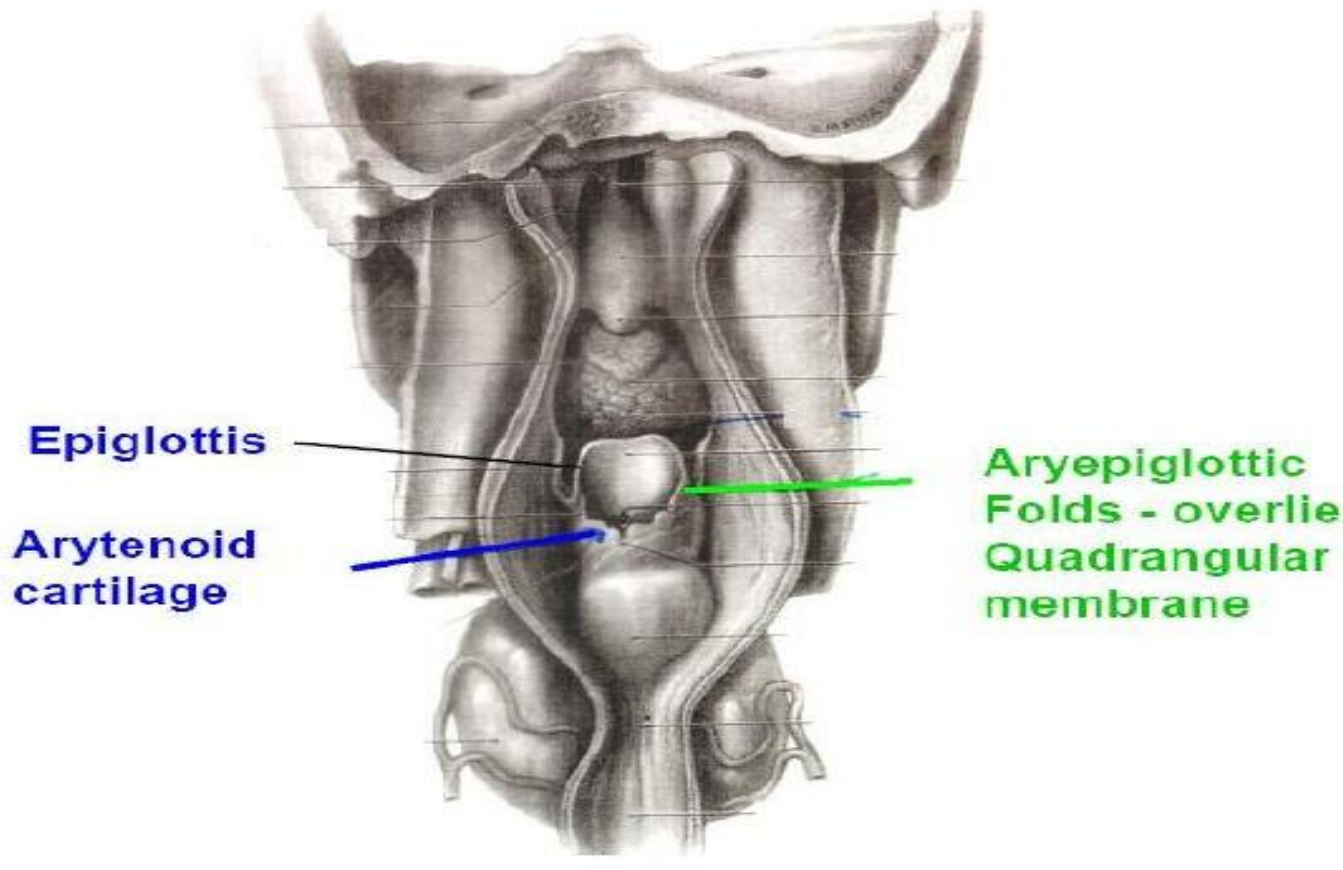
## LARYNX

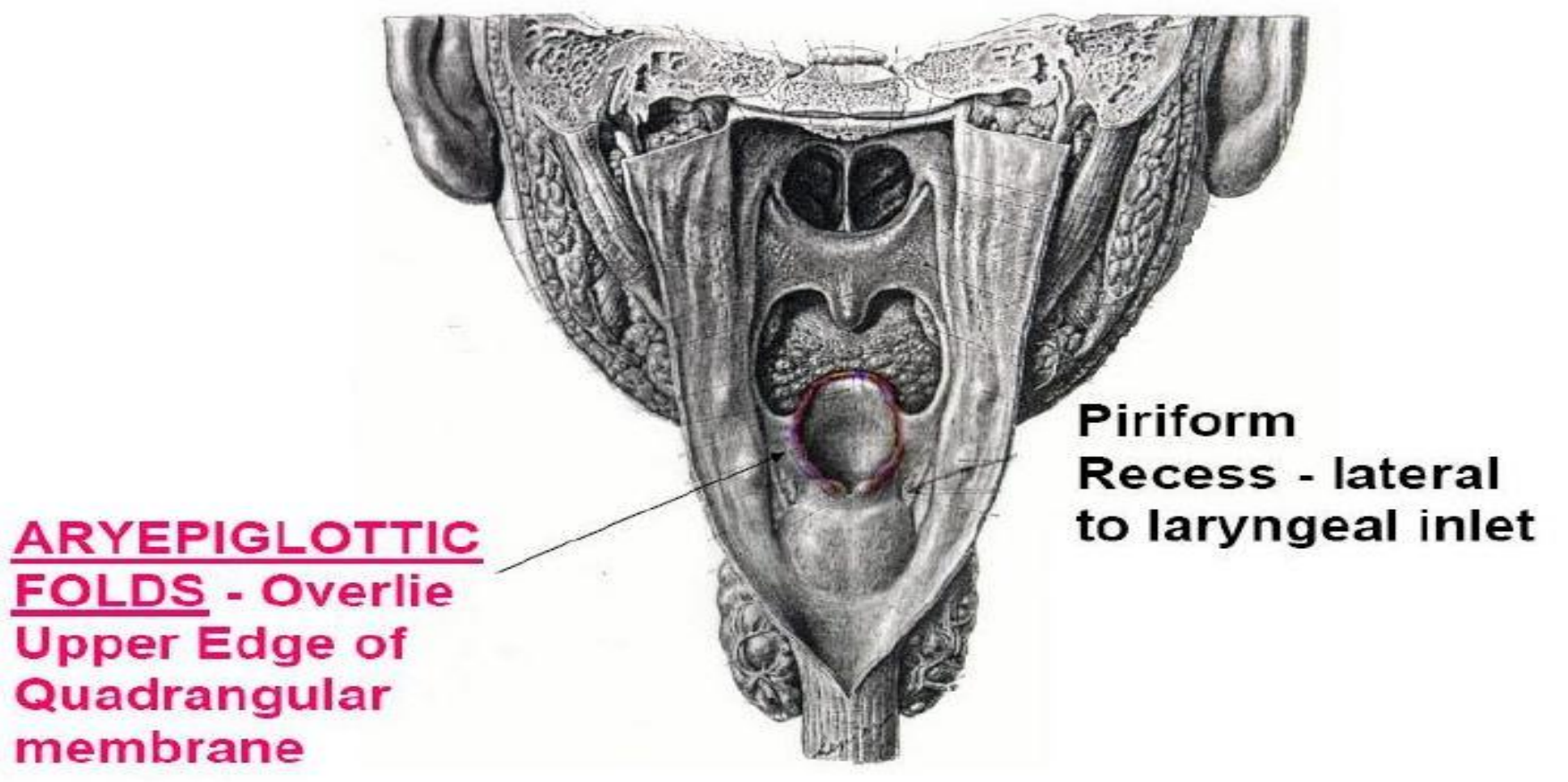
- Musculocartilagenous structure,
- Lined with mucous membrane
- Connected to pharynx and superior part of trachea
- Acts as essential sphincter guarding entrance into trachea
- Secondarily function as organ of voice
- Formed of nine cartilages connected by ligaments and muscles

Topography of the extrinsic musculature of the larynx



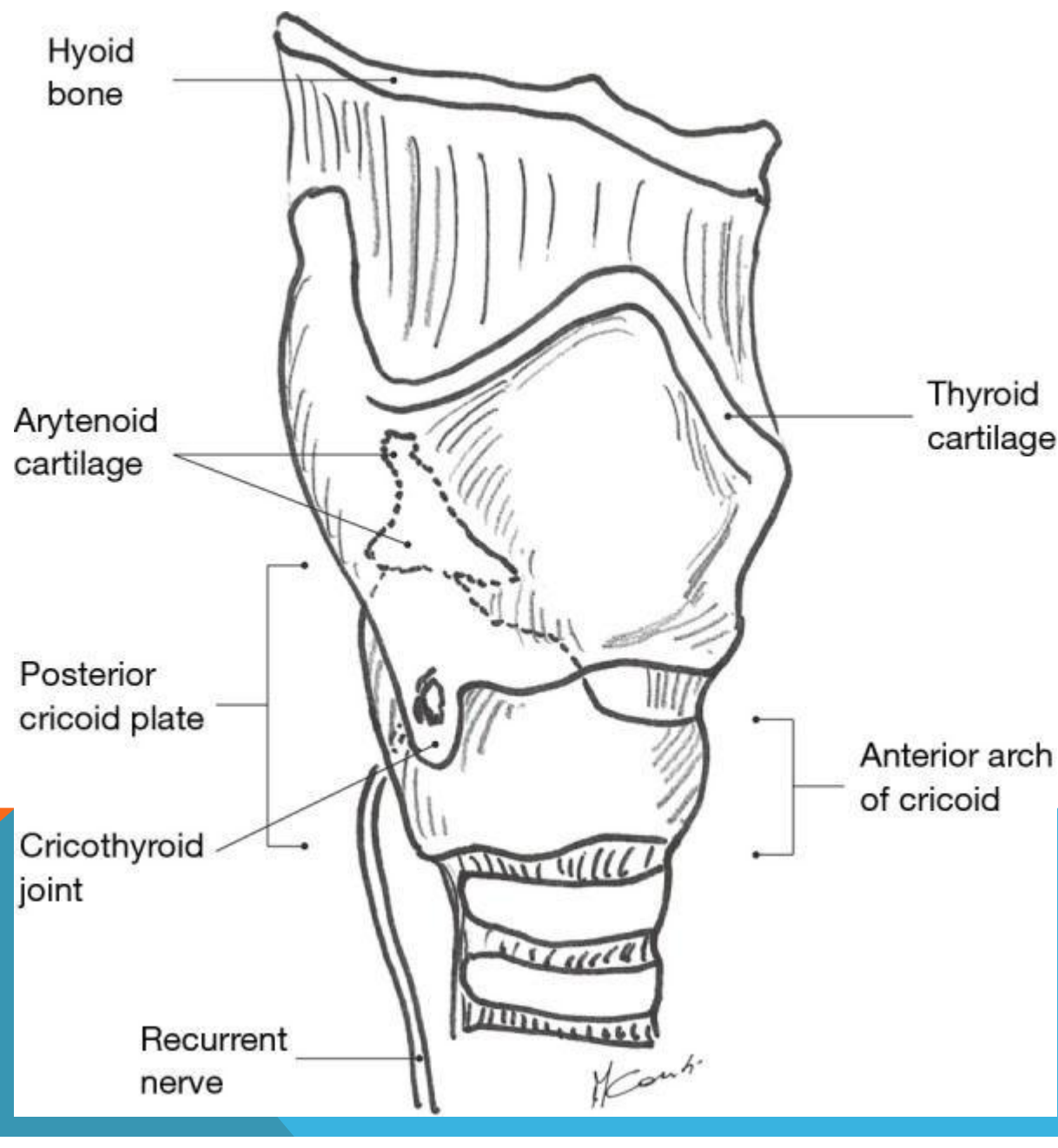


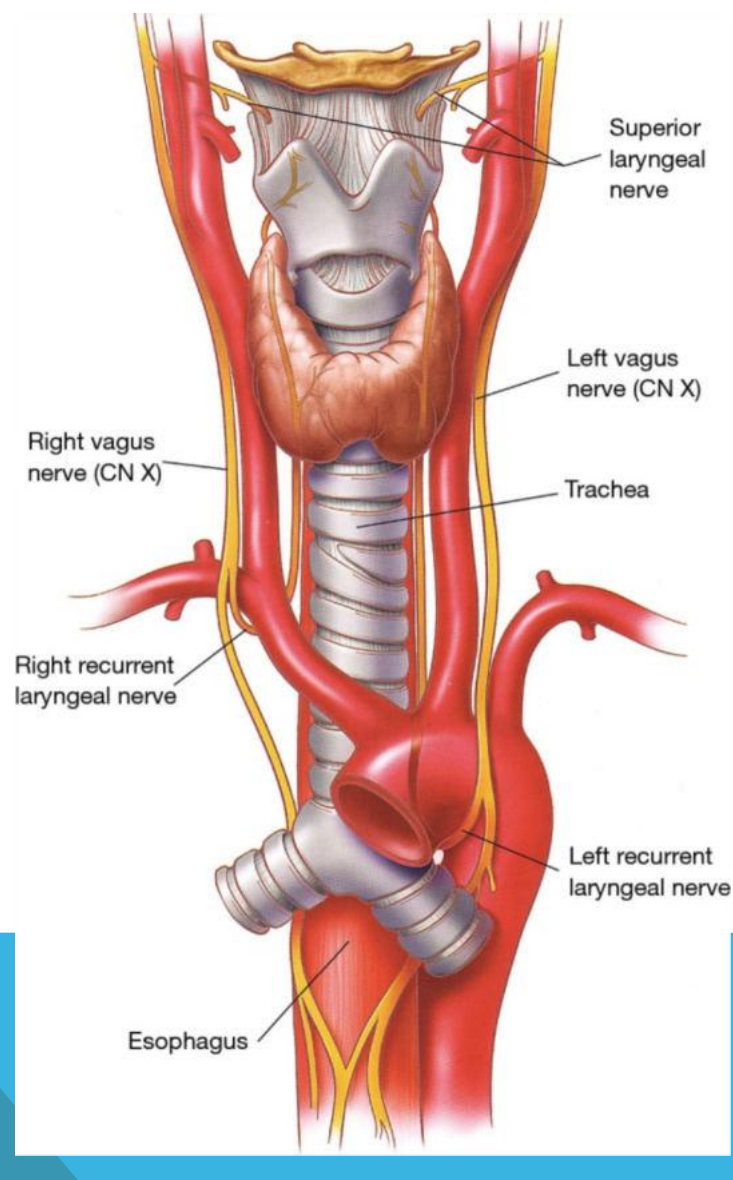



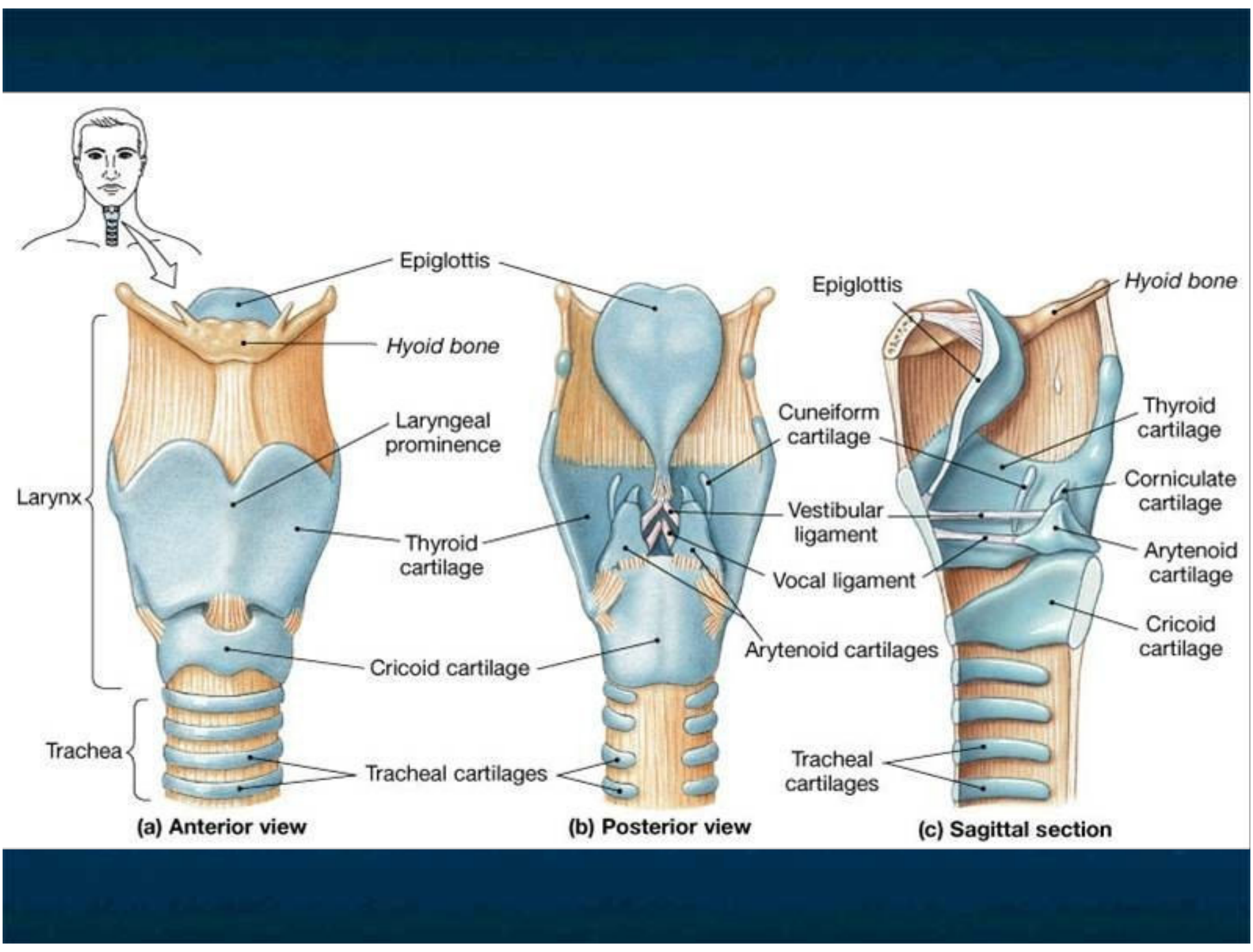



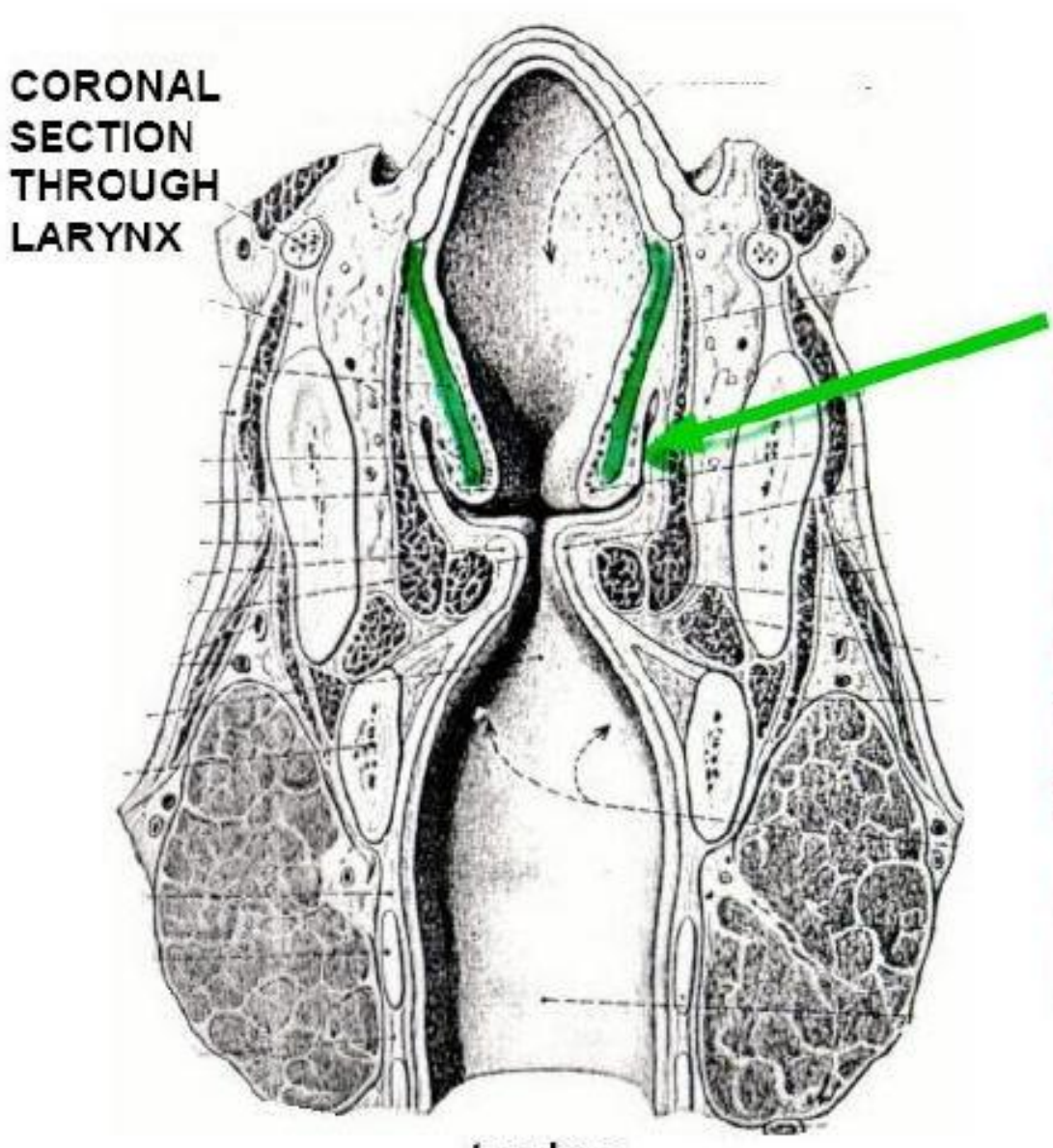

# ADAM'S APPLE

At puberty male larynx increases in size rapidly, and the thyroid cartilage projects to form the Adam's apple.

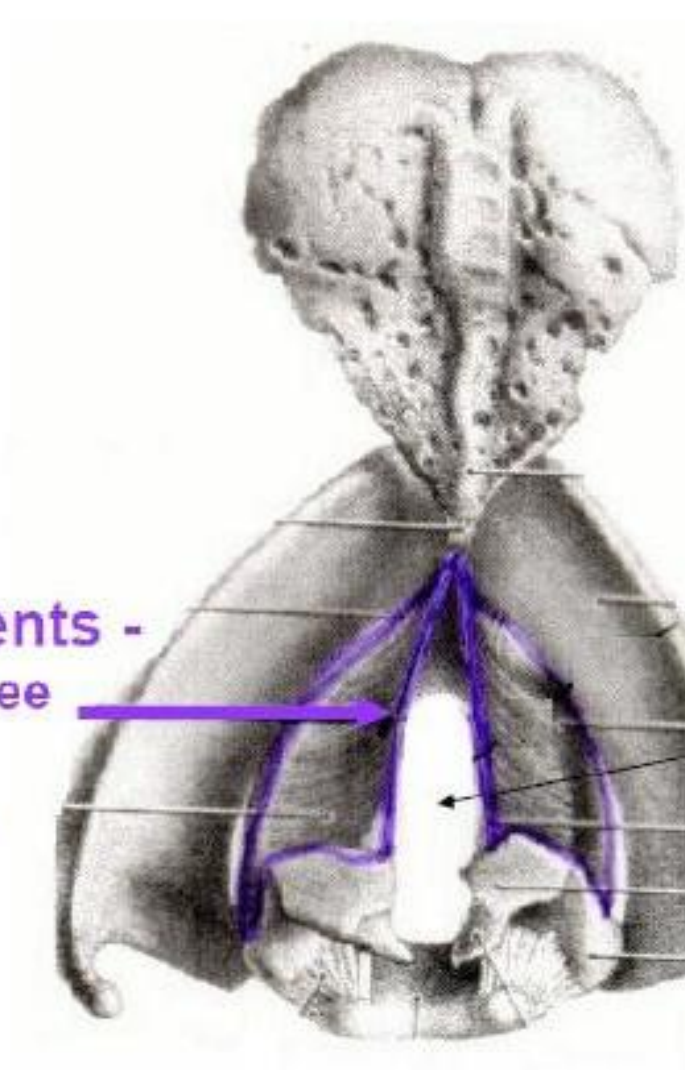


## B. FUNCTIONAL LIGAMENTS

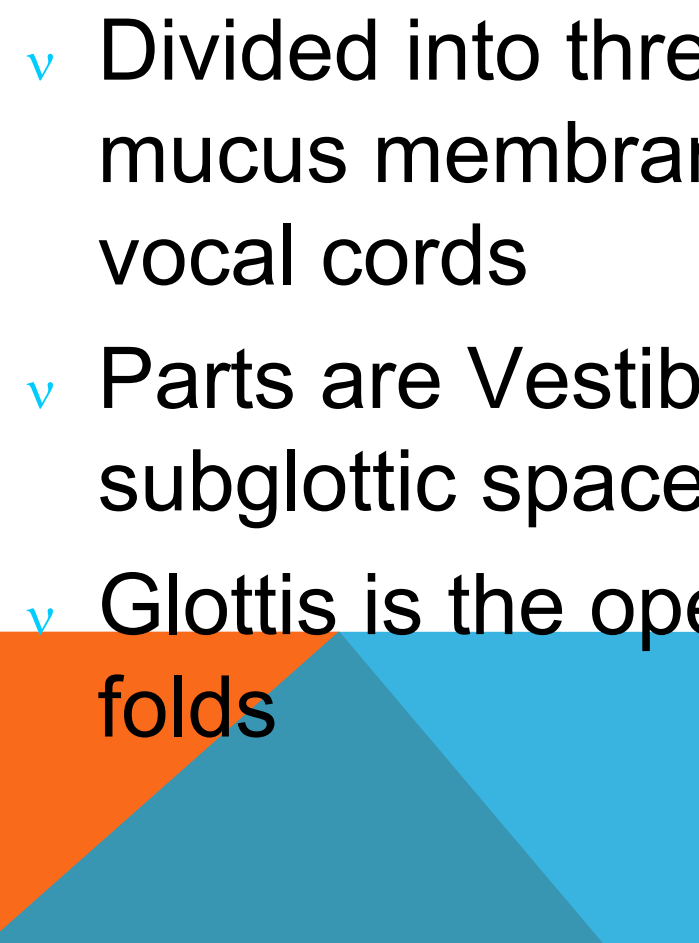


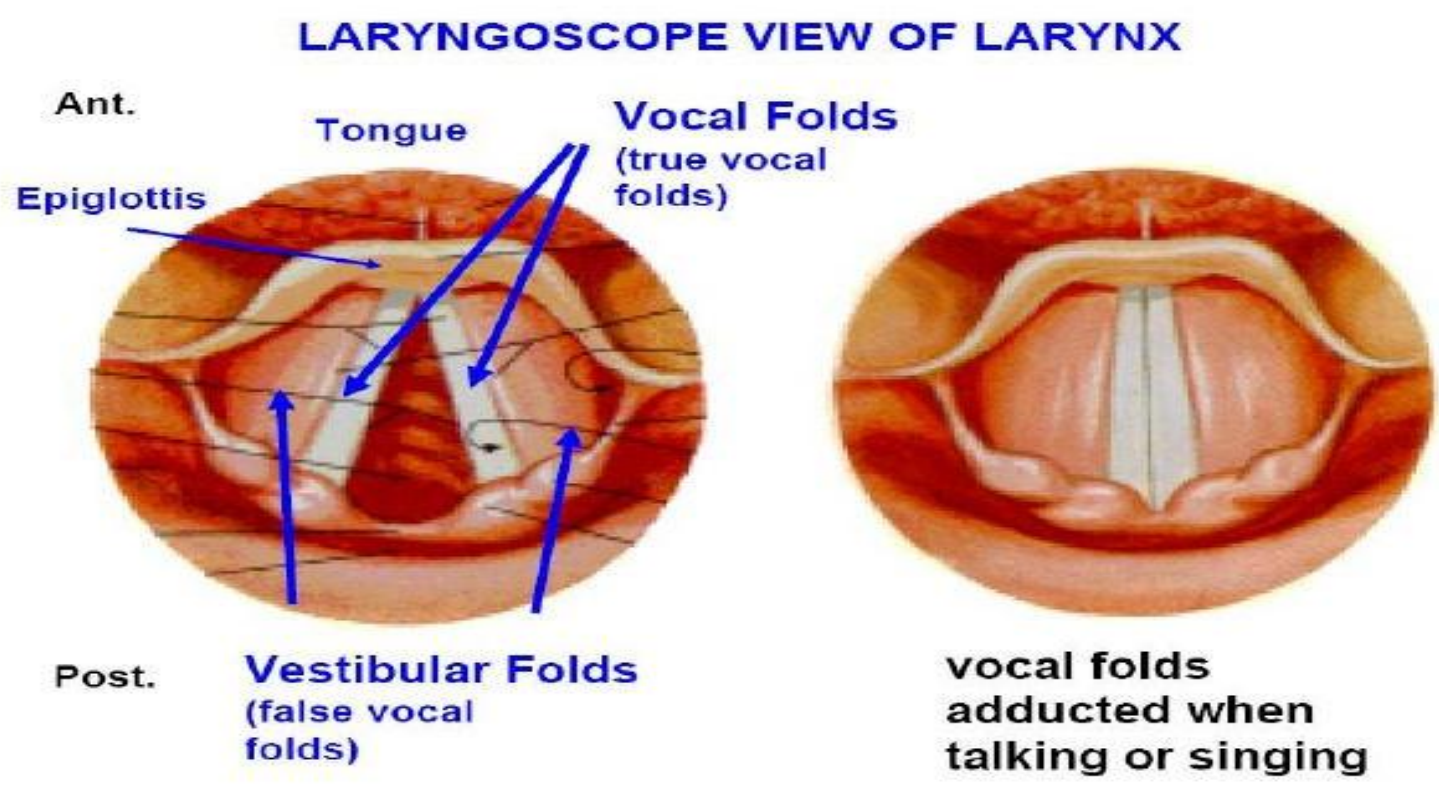

# CAVITY OF LARYNX

- EXTENT- from laryngeal inlet above to lower border of cricoid cartilage.
- Inlet of larynx communicates with laryngopharynx.

CAVITY OF LARYNX

- Divided into three parts by 2 folds of mucus membrane: False cords and True vocal cords
- Parts are Vestibule, ventricle and subglottic space
- Glottis is the opening between vocal folds






# MUSCLES OF LARYNX- INTRINSIC

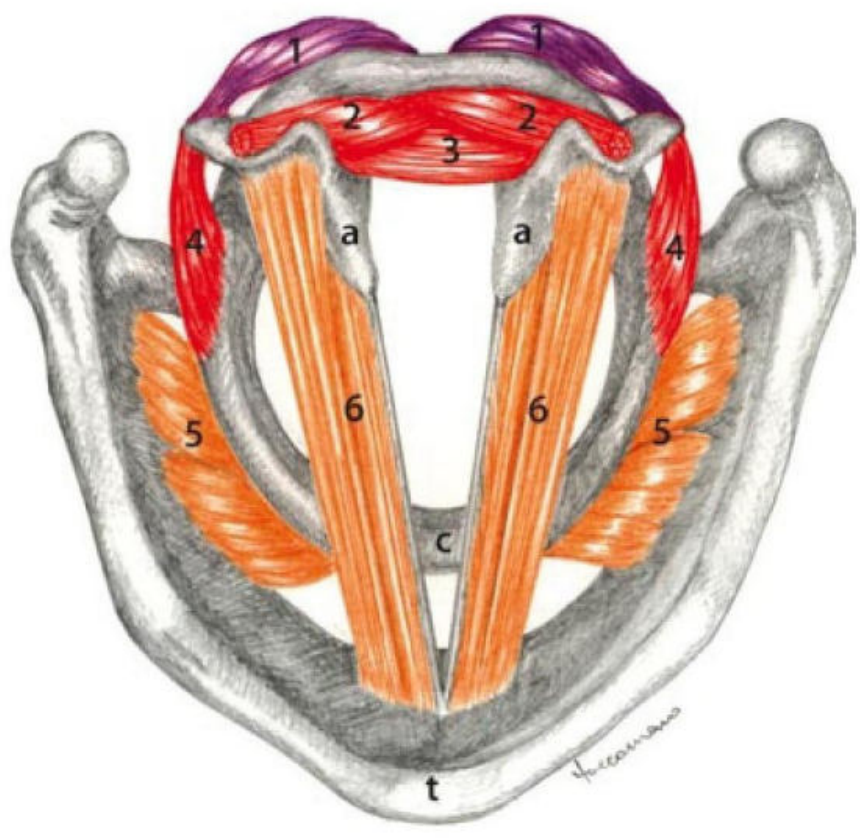



**Fig. 9.5** Intrinsic laryngeal muscle

c = cricoid cartilage
t = thyroid cartilage
a = arytenoids
1 = posterior cricoarytenoid muscle
2 = interarytenoid muscle (oblique component)
3 = interarytenoid muscle (transverse component)
4 = lateral cricoarytenoid muscle
5 = cricothyroid muscle
6 = thyroarytenoid muscle

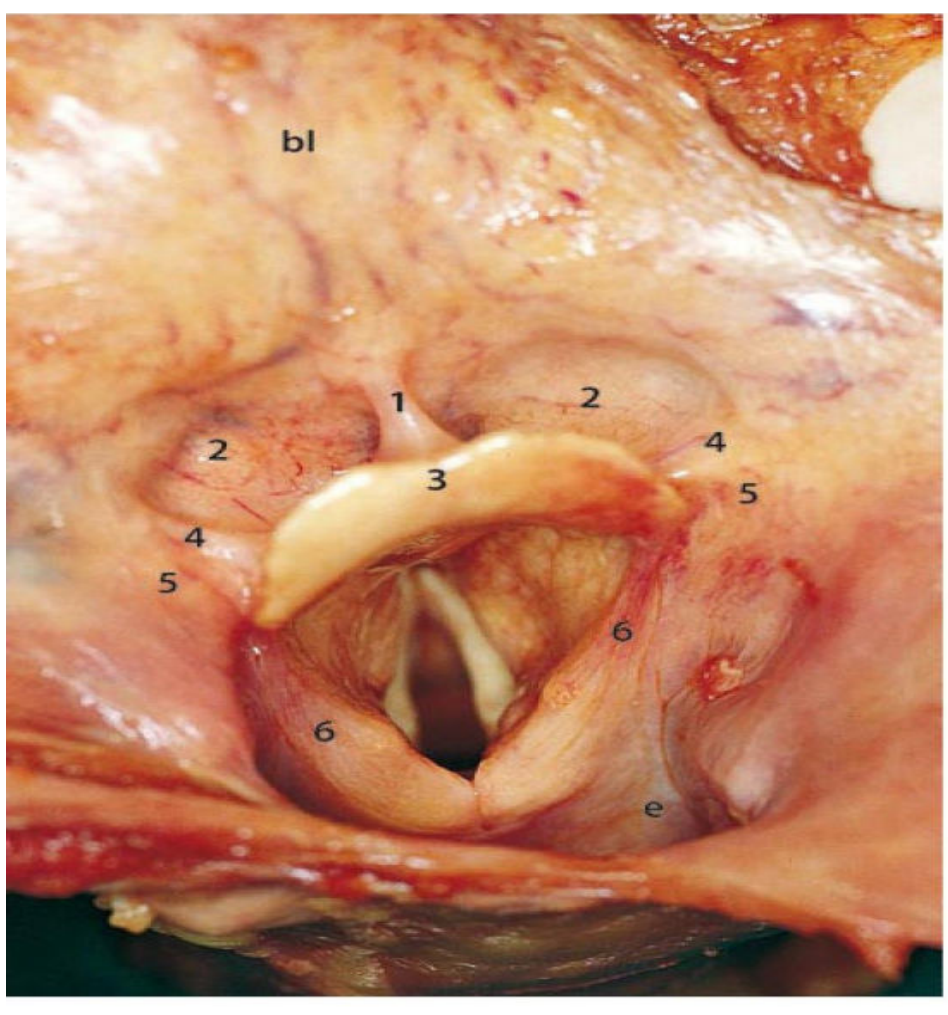



**Fig. 9.14** Larynx and hypopharynx: intraluminal view (III)

bl = tongue base
e = esophagus
1 = median glossoepiglottic fold
2 = glossoepiglottic vallecula
3 = suprahyoid epiglottis
4 = lateral glossoepiglottic fold
5 = pharyngoepiglottic fold
6 = aryepiglottic fold

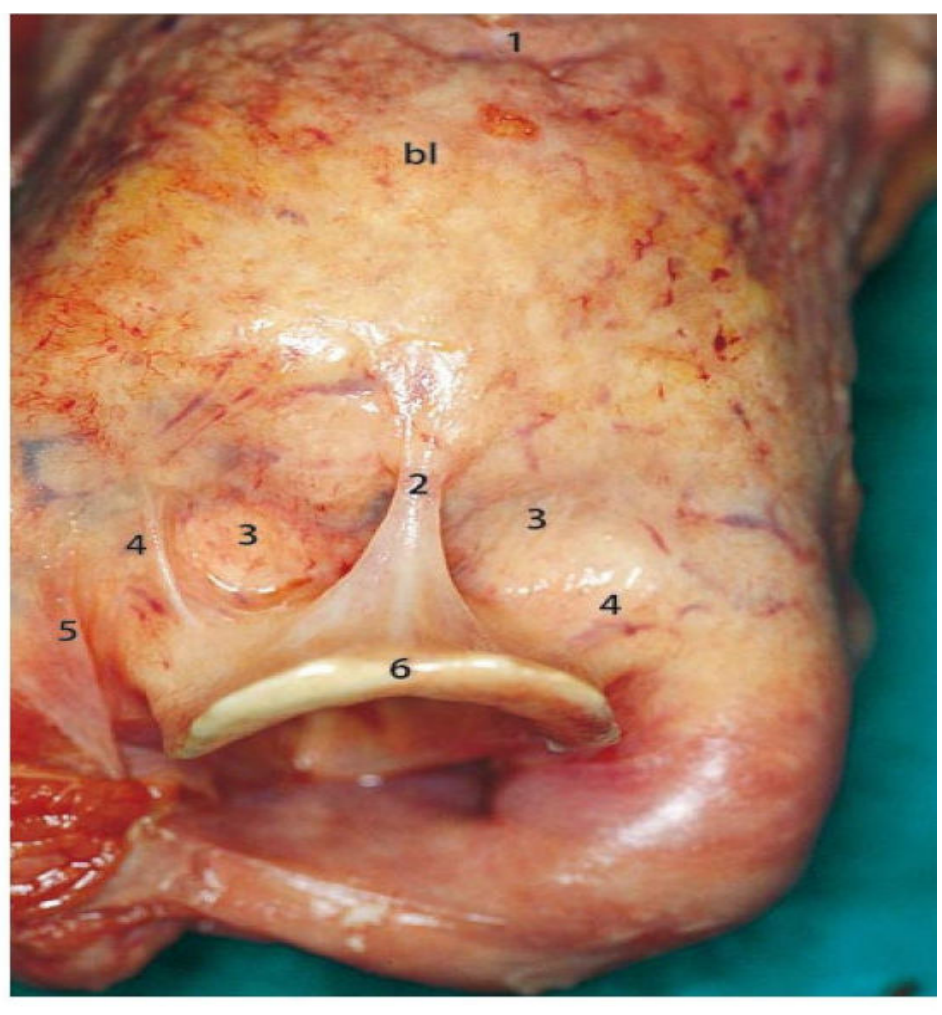



**Fig. 9.15** Larynx and tongue base

bl = tongue base
1 = foramen cecum (apex of lingual "V")
2 = median glossoepiglottic fold
3 = glossoepiglottic vallecula
4 = lateral glossoepiglottic fold
5 = pharyngoepiglottic fold
6 = epiglottis

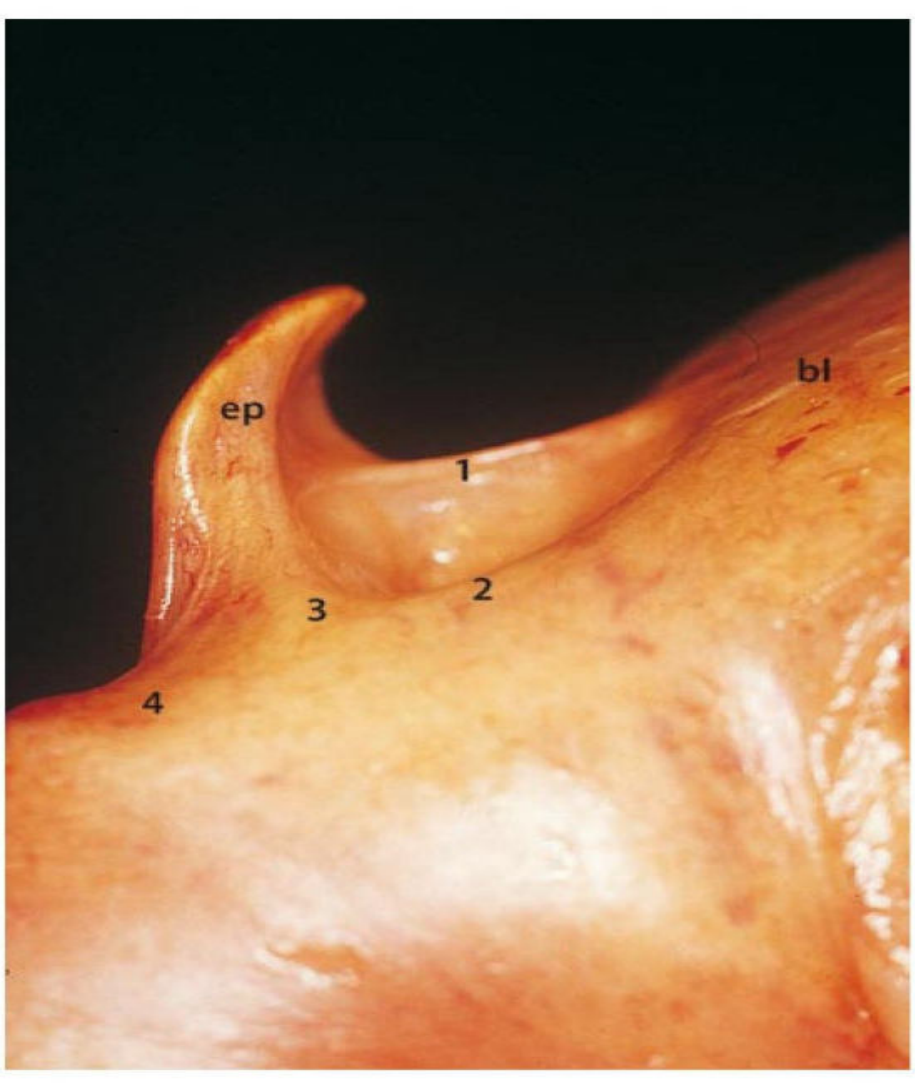



**Fig. 9.16** Three-folds region

ep = epiglottis
bl = tongue base
1 = median glossoepiglottic fold
2 = lateral glossoepiglottic fold
3 = pharyngoepiglottic fold
4 = aryepiglottic fold

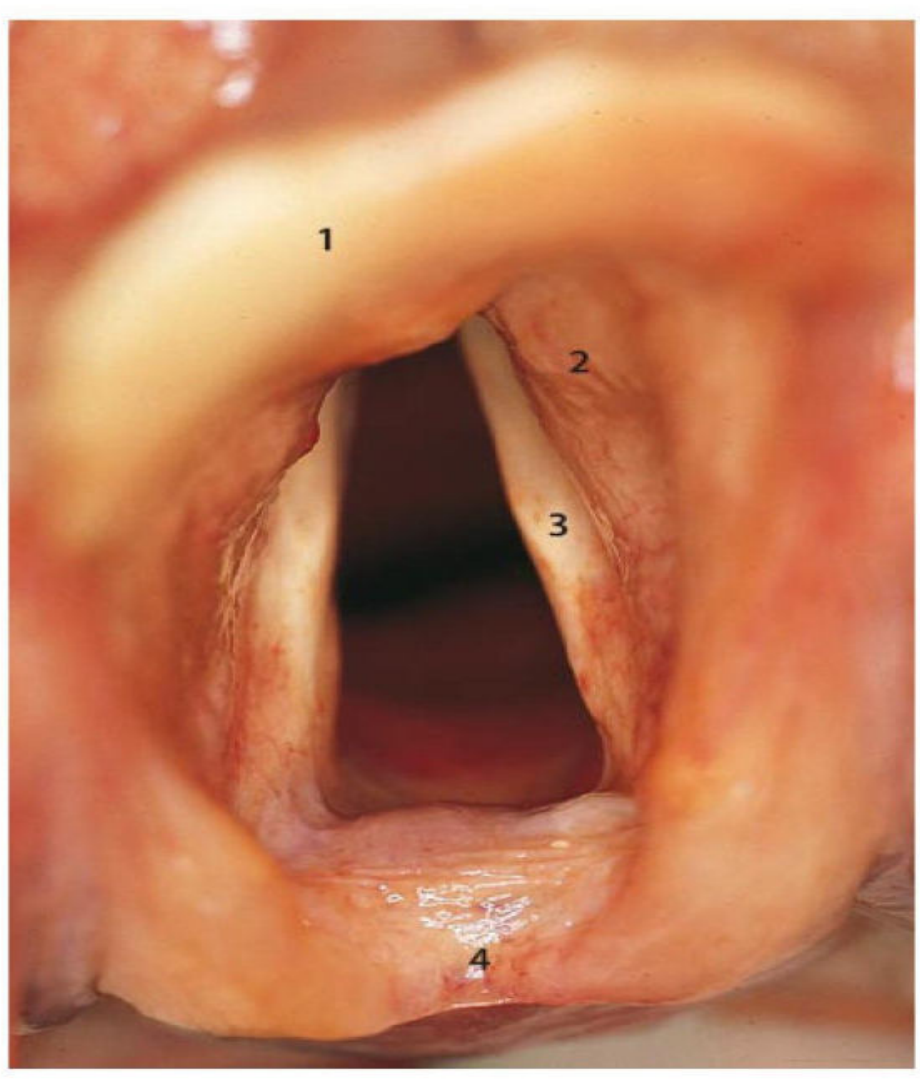



**Fig. 9.17** Larynx: glottic plane

1 = epiglottis
2 = ventricular fold
3 = vocal cord
4 = posterior commissure

## HISTOLOGY OF LARYNX

- Mucous membrane lines the entire larynx.
- Stratified squamous epithelium lines true vocal cords and upper parts of vestibule.
- Pseudostratified Columnar ciliated epithelium lines rest of the cavity.
- Mucous glands preset in all parts except on free edges of vocal cords

## LYMPHATIC DRAINAGE

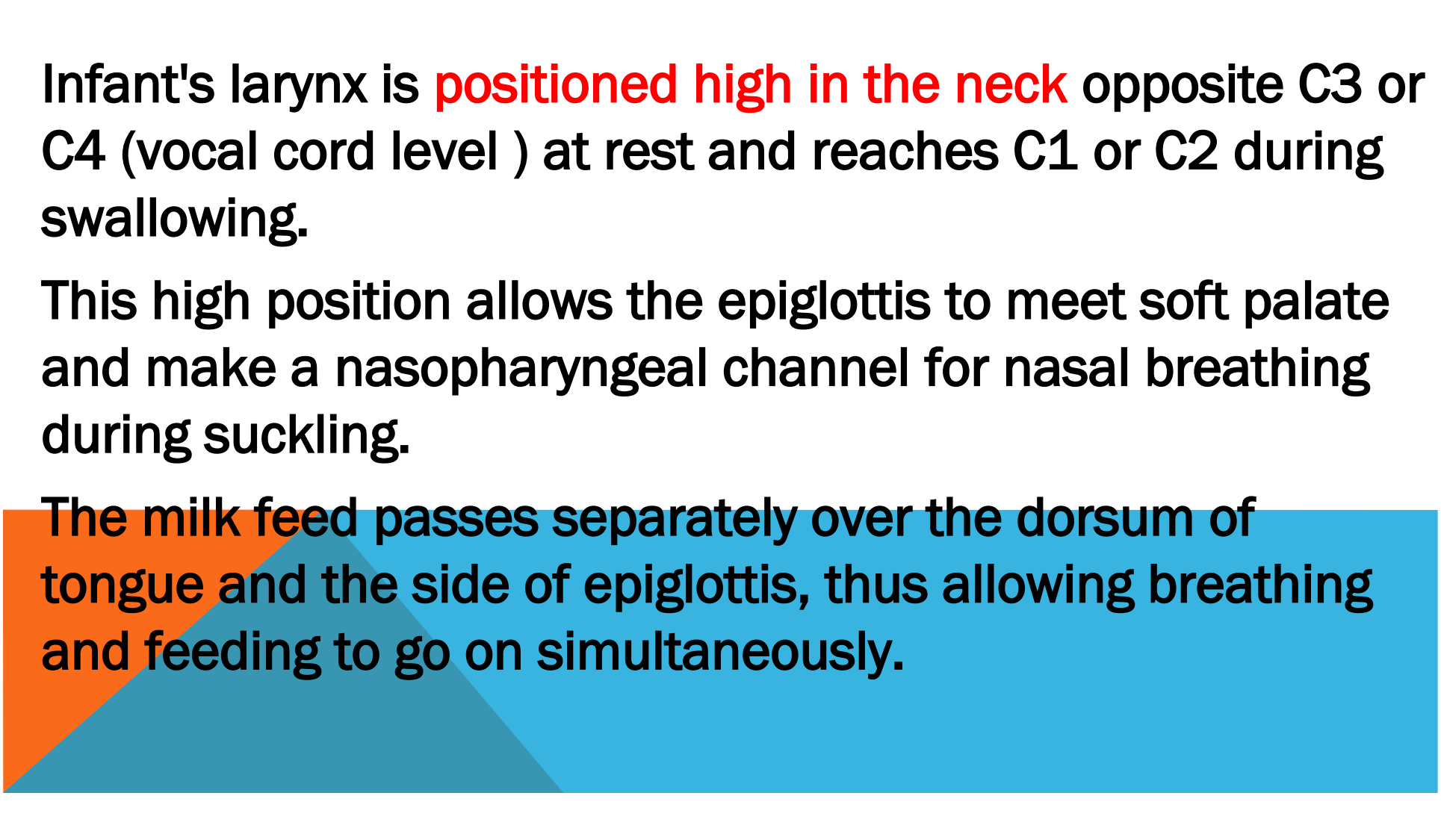
- SUPRAGLOTTIS-pre-epiglottic and upper deep cervical nodes.
- GLOTTIS-Lymphatics are practically absent
- SUBGLOTTIS-prelaryngeal and pretracheal nodes also lower deep cervical nodes

## LARYNX OF AN INFANT DIFFERENT FROM ADULT

Infant's larynx is positioned high in the neck opposite C3 or C4 (vocal cord level ) at rest and reaches C1 or C2 during swallowing.

This high position allows the epiglottis to meet soft palate and make a nasopharyngeal channel for nasal breathing during suckling.

The milk feed passes separately over the dorsum of tongue and the side of epiglottis, thus allowing breathing and feeding to go on simultaneously.



## LARYNX OF AN INFANT DIFFERENT FROM ADULT

Laryngeal cartilages are soft and collapse easily.

Epiglottis is omega-shaped and arytenoids relatively large covering significant portion of the posterior glottis .

LARYNX OF AN INFANT DIFFERENT FROM ADULT

Thyroid cartilage in an infant is flat.

It also overlaps the cricoid cartilage and is in turn overlapped by the hyoid bone.

Thus cricothyroid and thyrohyoid spaces are narrow and not easily discernible as landmarks when performing tracheostomy.

LARYNX OF AN INFANT DIFFERENT FROM ADULT

Infant's larynx is small and conical. The diameter of cricoid cartilage is smaller than the size of glottis, making subglottis the narrowest part.

It has a bearing in the selection of paediatric endotracheal tube.

In adults, subglottic-glottic dimensions are approximately same and larynx is cylindrical.

LARYNX OF AN INFANT DIFFERENT FROM ADULT

Submucosal tissues of infant's larynx are comparatively loose and easily undergo oedematous change with trauma or inflammation leading to obstruction.

Infant's larynx shows two spurts in growth. In the first three years of life larynx grows in width and length, and thus obviates the need for any airway surgery in certain congenital anomalies.

## LARYNX OF AN INFANT DIFFERENT FROM ADULT

The second spurt in growth occurs during adolescence when the thyroid angle develops. The length of vocal cords then increases leading to voice changes associated with puberty.

With growth of the neck, larynx gradually descends to adult position opposite Cs (vocal cord level).

## LARYNX OF AN INFANT DIFFERENT FROM ADULT

In childhood, vocal cord is 6 mm in females and 8 mm in males.

It increases to 15-19 mm in adult females and 17-23 in adult male.

Adult male voices are usually lower-pitched and have larger folds.

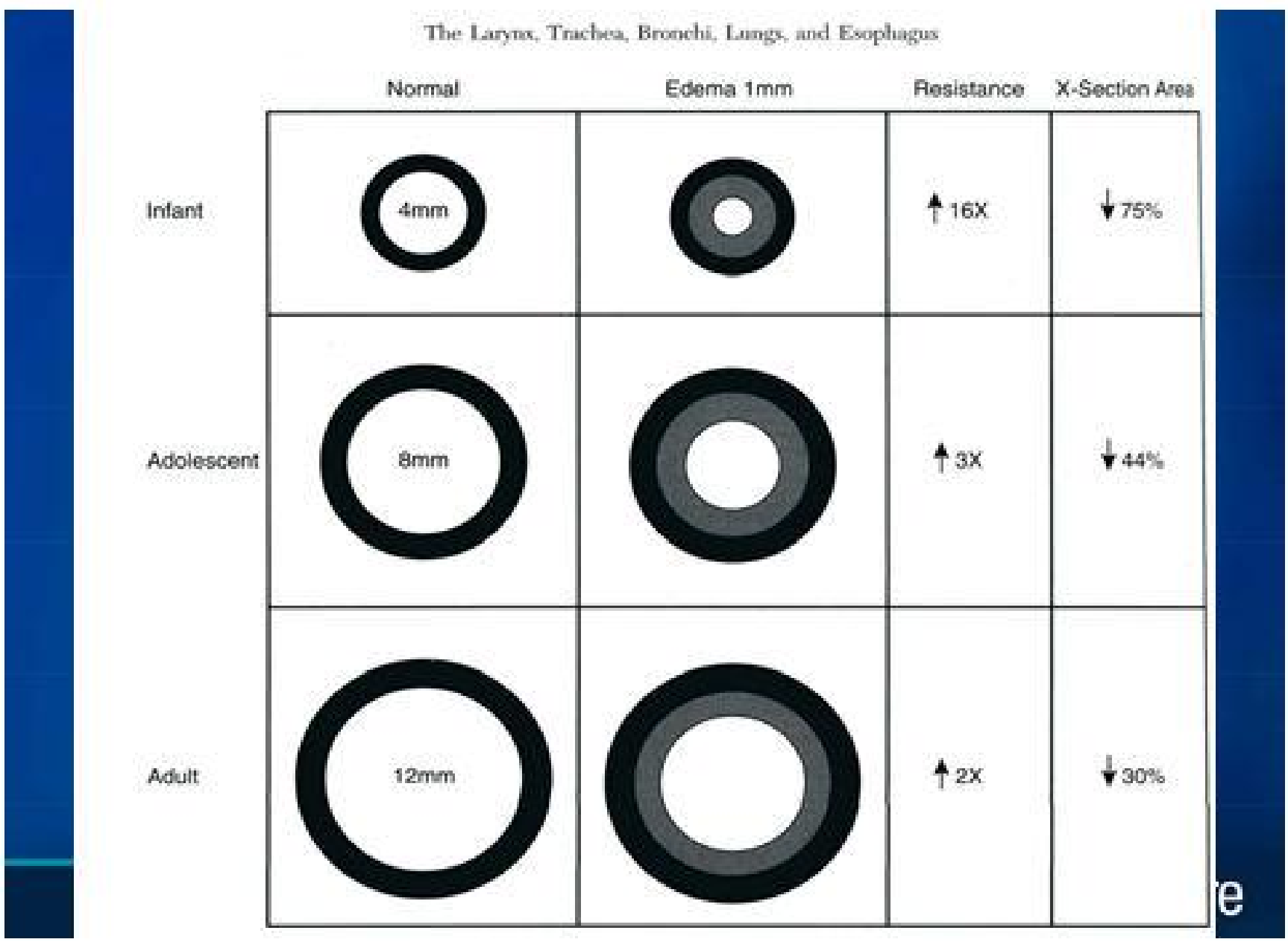
## INFANT AIRWAY

The subglottic diameter measures approximately 4.5

A diameter of less then 3.5 mm suggests a marginal subglottic airway and is consistent with subglottic stenosis

## INFANT AIRWAY

- Circumferential mucosal edema of 1 mm within the larynx of an infant causes a glottis to narrow by over 60% to 75%.




## LOCATION OF OBSTRUCTION

Stridor can be localized to discrete areas of the airway according to the nature of the sound in relationship to the phase of breathing

## LOCATION OF OBSTRUCTION

These discrete regions can be divided into three zones

Supraglottic and supralaryngeal zone which includes the pharynx

Extrathoracic tracheal zone including both glottis subglottis and cervical trachea

Intrathoracic tracheal zone which includes primary and secondary bronchi

## LOCATION OF OBSTRUCTION

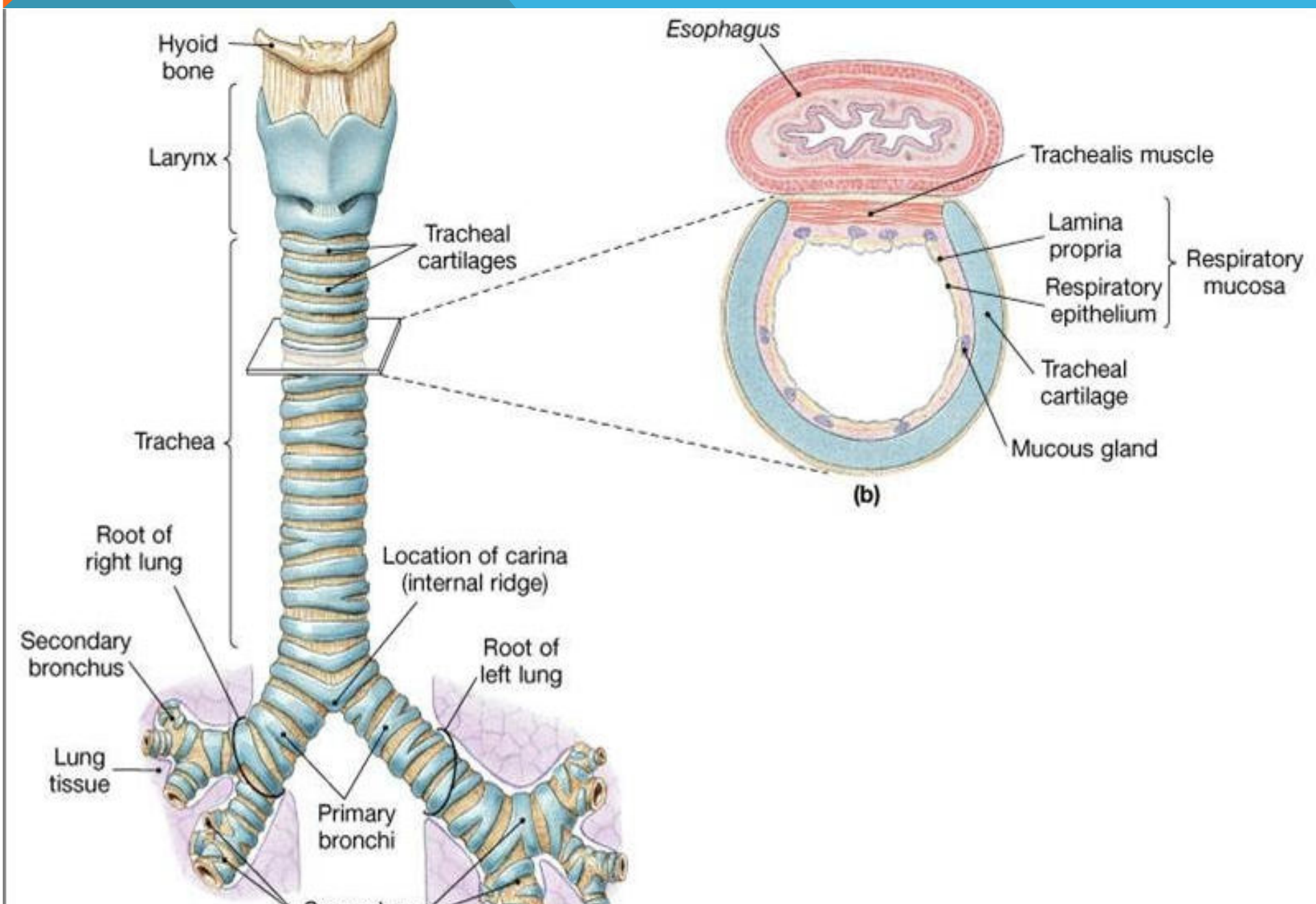
Supraglottis or Pharynx - Inspiratory and high- pitched-

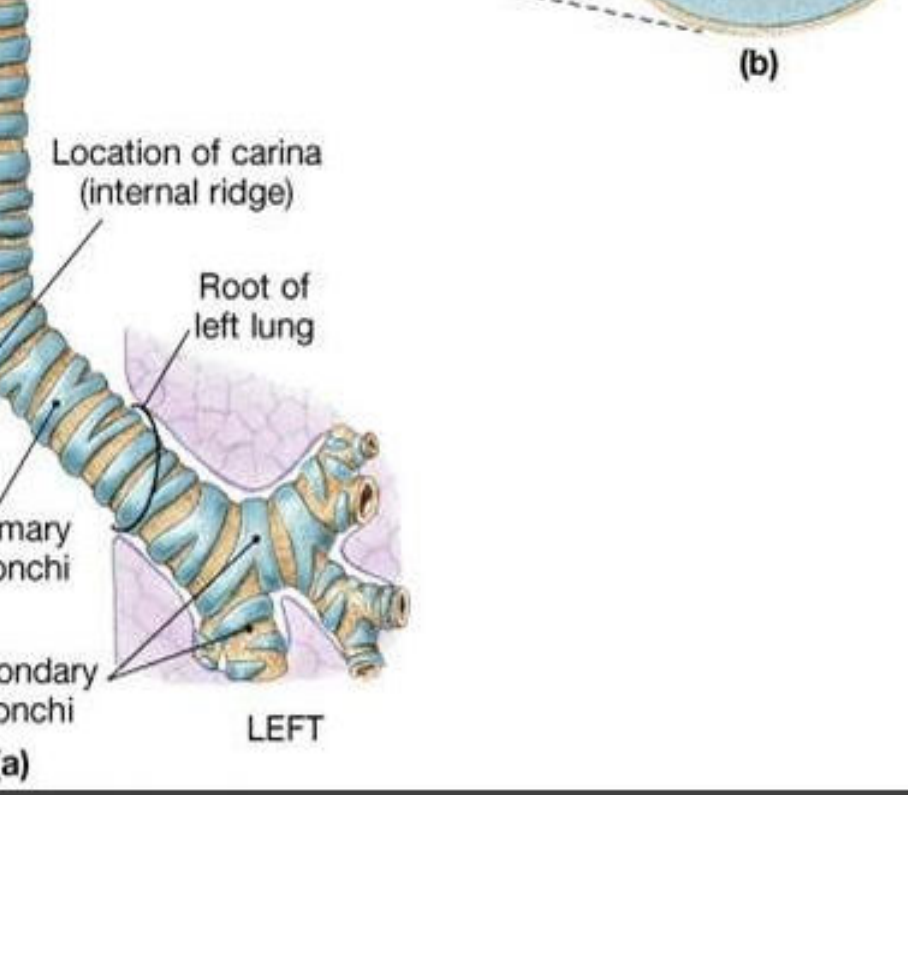
Glottis and Subglottis (extrathoracic tracheal zone)- Biphasic of intermediate pitch

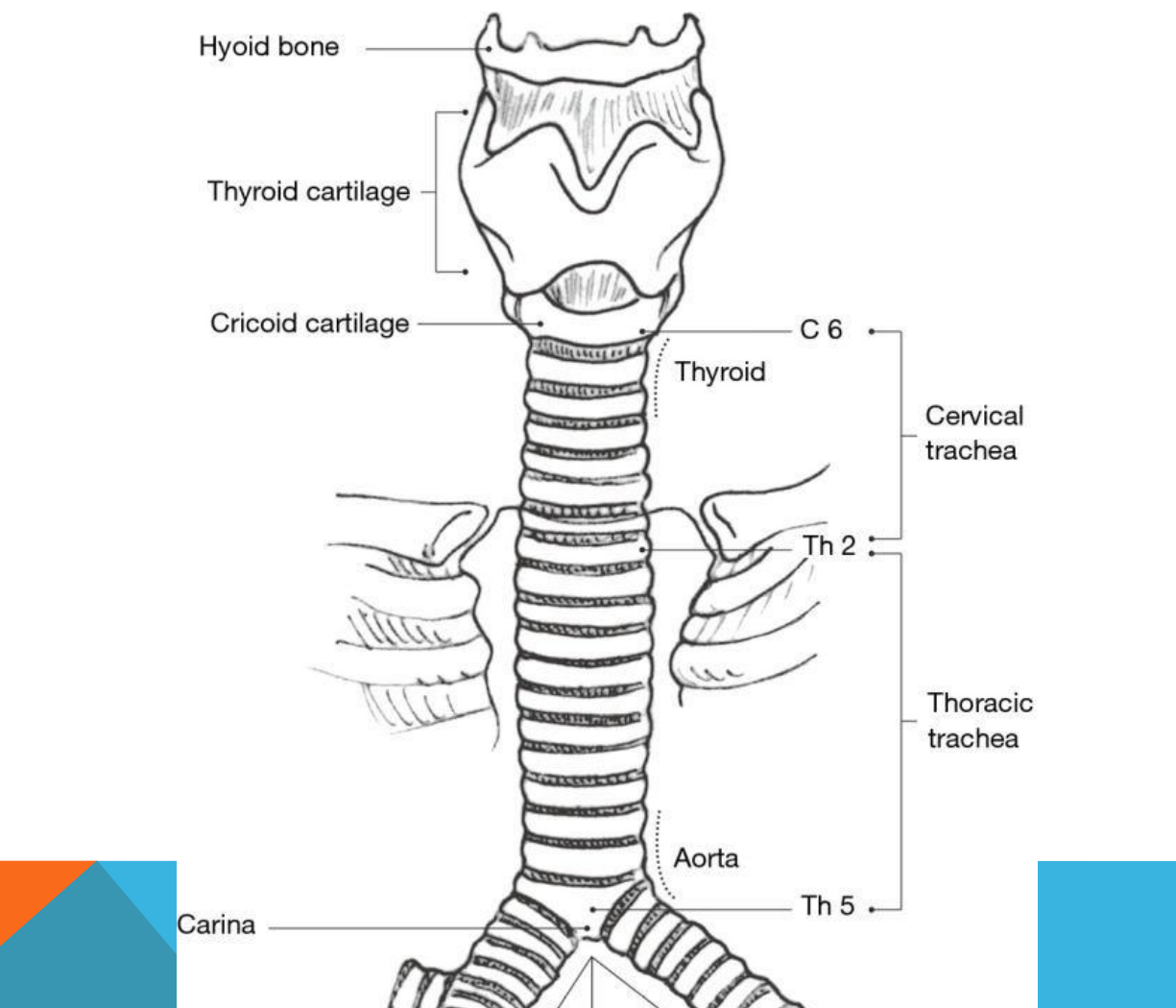
Intrathoracic tracheal/bronchial zone- Expiratory often confused with wheezing

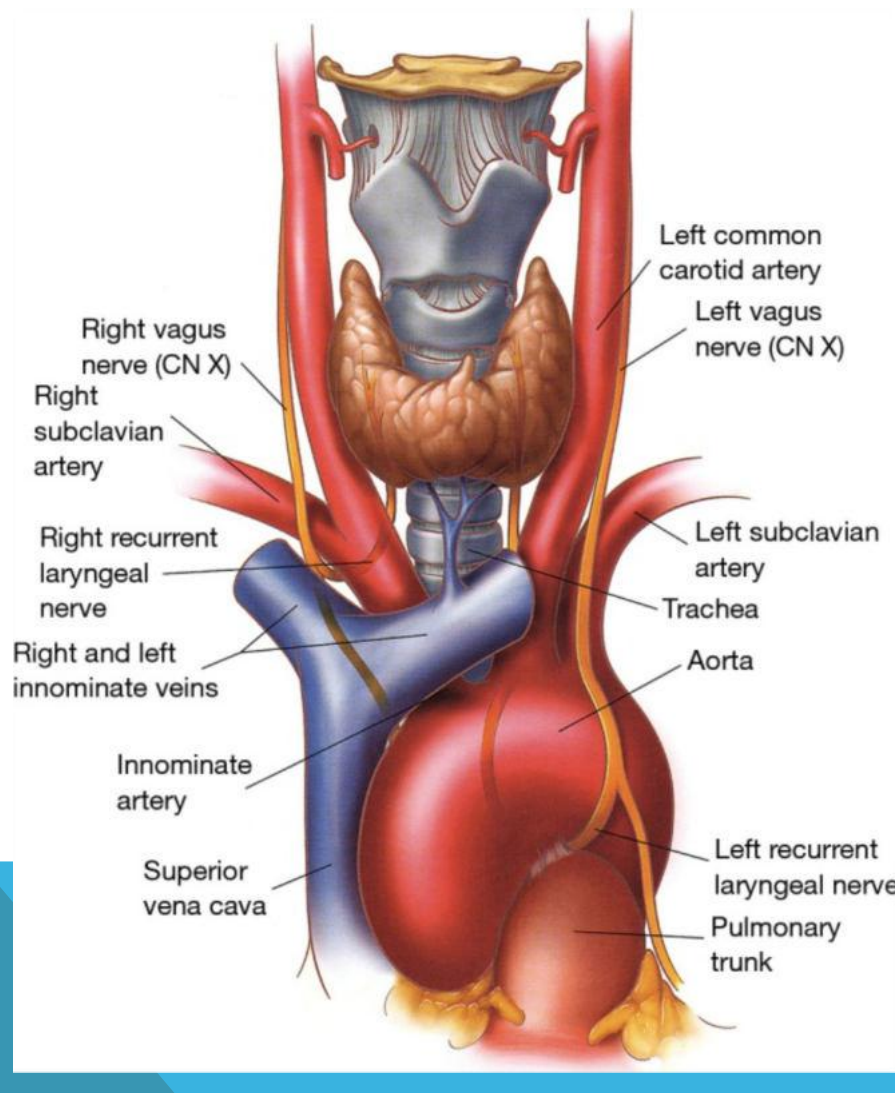
# ANATOMY OF TRACHEA

- Tube made up of cartilage and membrane and measures approx 10-11cm in adult
- Extends from C-6 to T-5
- There are 16-20 incomplete cartilaginous rings. In neck 6-7 rings are present.





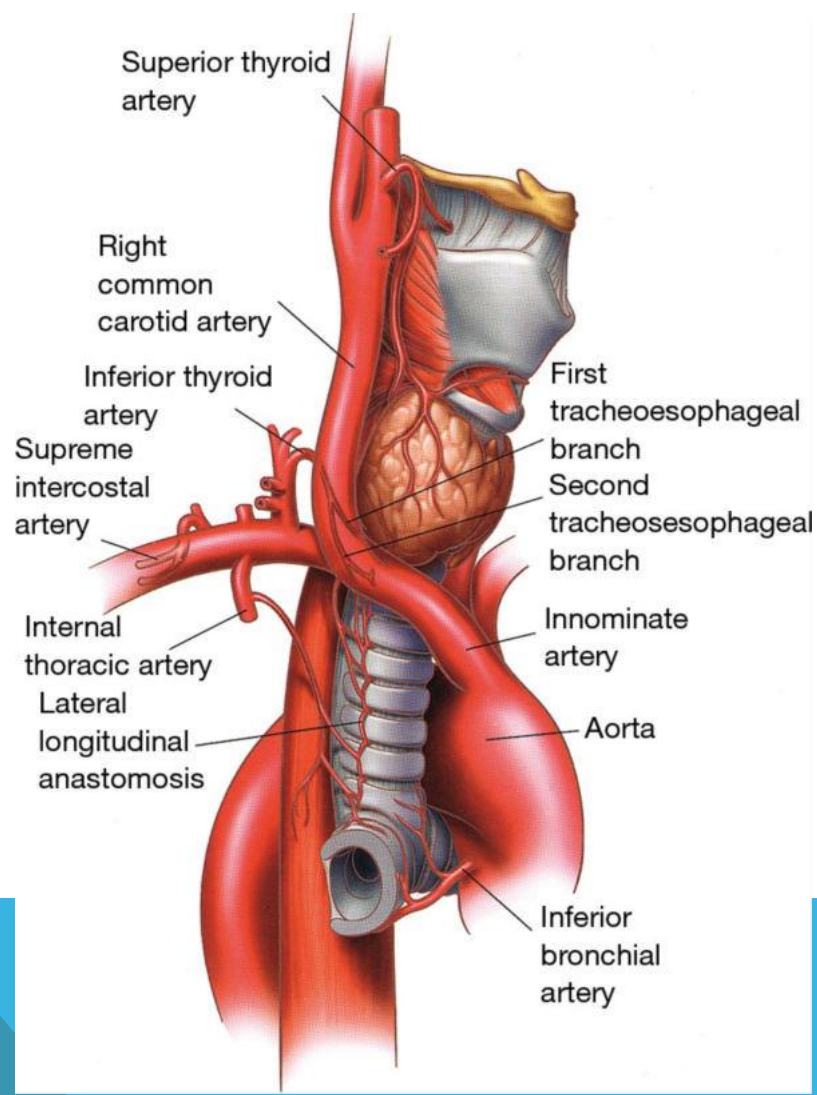

# BLOOD SUPPLY

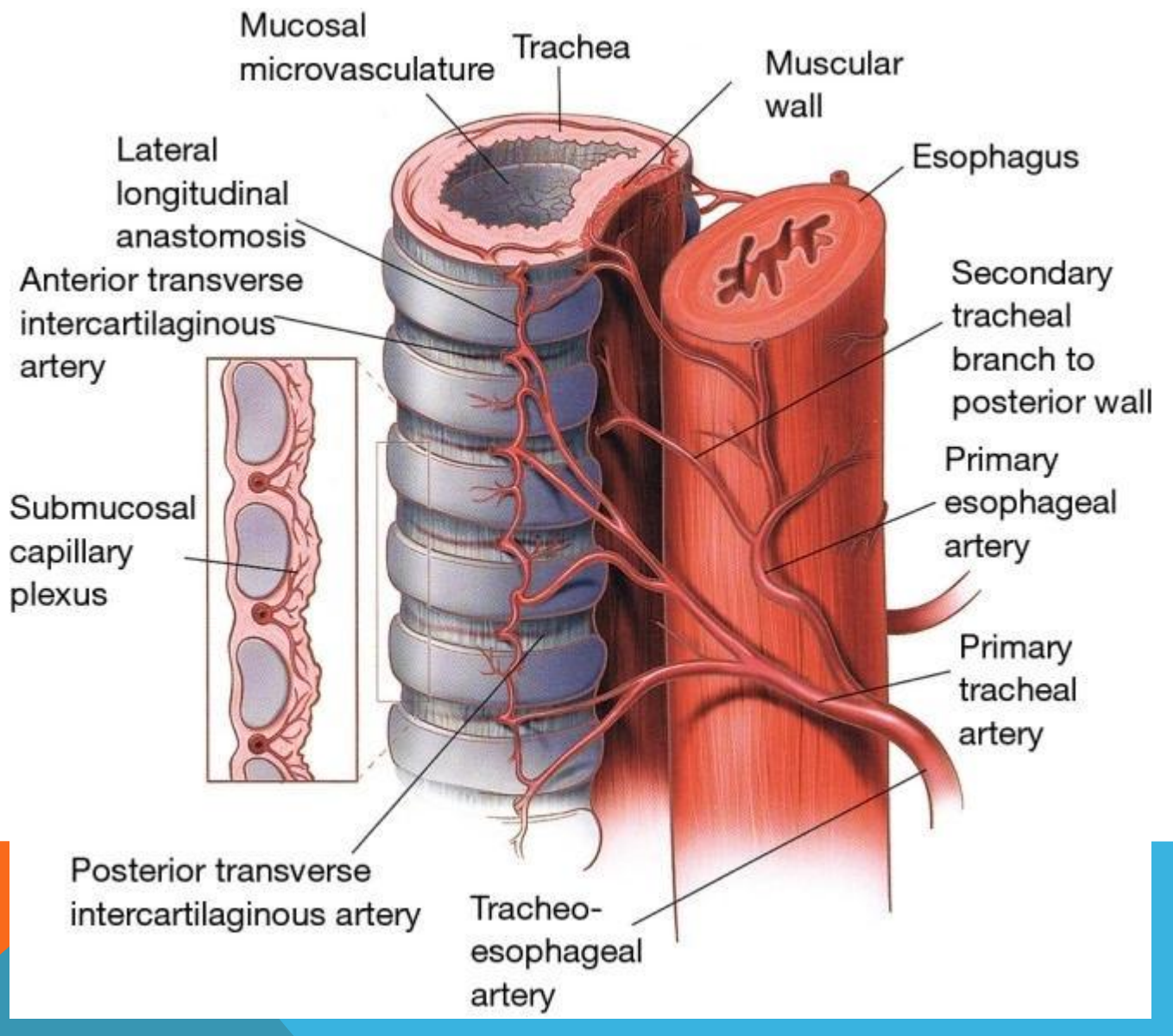
- The inferior thyroid vessels and their tracheoesophageal branches provide blood supply to the proximal trachea while the bronchial arteries vascularize the distal trachea, carina, and main bronchi

The trachea is also supplied by small branches originating from the subclavian artery, internal mammary artery, and innominate artery.

## VENOUS AND LYMPHATIC DRAINAGE

Venous drainage is through the azygos and hemi azygos systems while lymphatic drainage is through the low and high paratracheal nodal chains eventually reaching the deep cervical nodes.






# NERVE SUPPLY

- Vagus, recurrent laryngeal nerve and sympathetic trunk

# LYMPHATICS

- Pretracheal and paratracheal lymph nodes