

Larynx- II

Lesson Plan

❖ Ligaments & Membranes:

- Extrinsic
- Intrinsic

❖ Thyrohyoid membrane.

❖ Thyrohyoid ligaments.

❖ Hyoepiglottic ligament.

❖ Thyroepiglottic ligament.

❖ Cricothyroid ligament.

❖ Cricotracheal ligament.

❖ Intrinsic ligaments and membranes:

- Quadrangular membrane and vestibular ligaments.
- Cricovocal membrane and vocal ligaments.

❖ Muscles:

- Extrinsic
- Intrinsic

❖ Cricothyroid muscle.

❖ Vocalis muscle.

❖ Posterior Cricoarytenoid muscle.

Ligaments & Membranes

- Extrinsic
- Intrinsic

Extrinsic Ligaments & Membrane

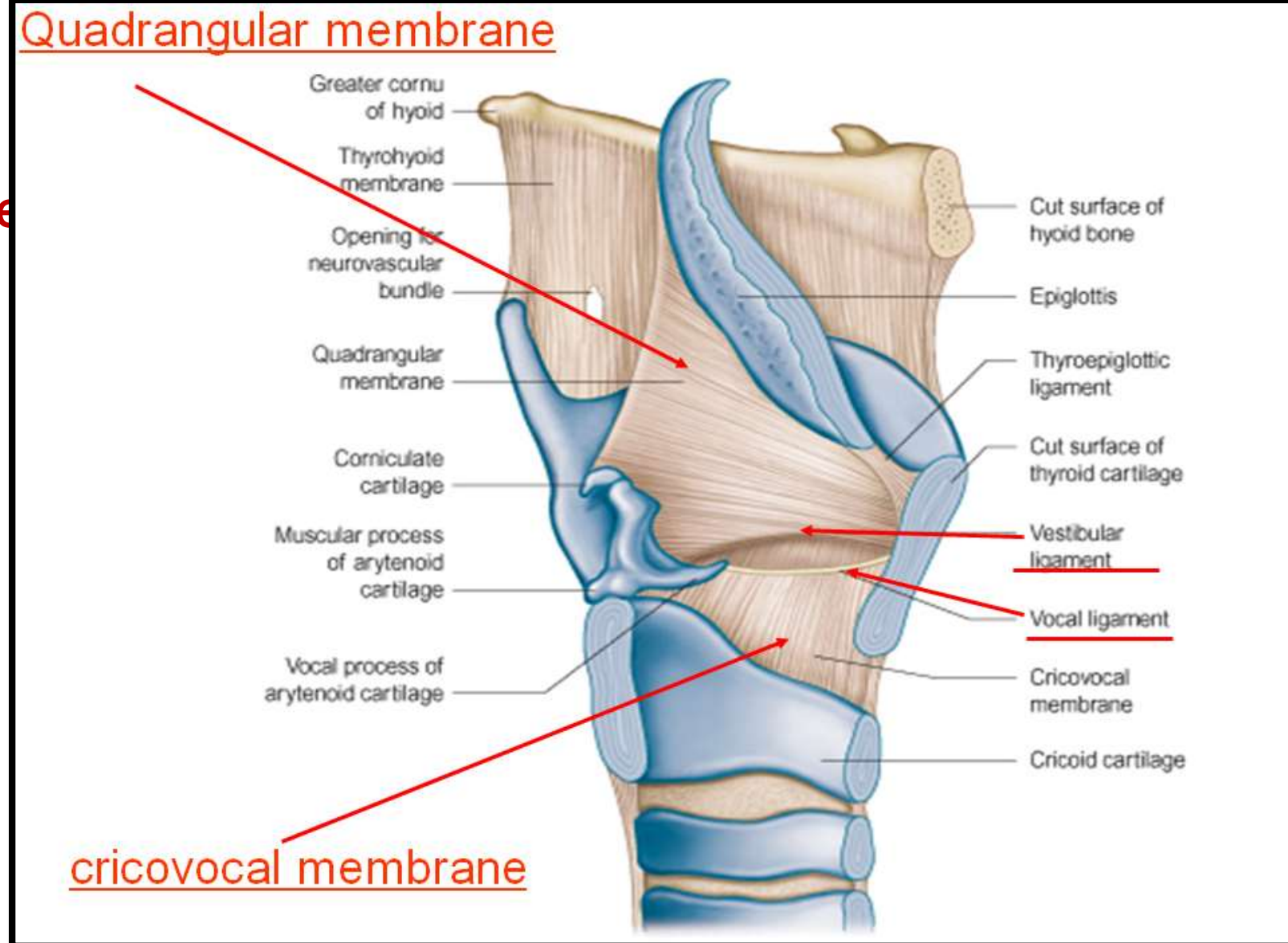
- They are outside the laryngeal

Extrinsic Membrane-

- Thyrohyoid membrane.

Extrinsic Ligaments-

- Hyoepiglottic ligament.
- Thyrohyoid ligaments.
- Thyroepiglottic ligament.
- Cricothyroid ligament.
- Cricotracheal ligament.



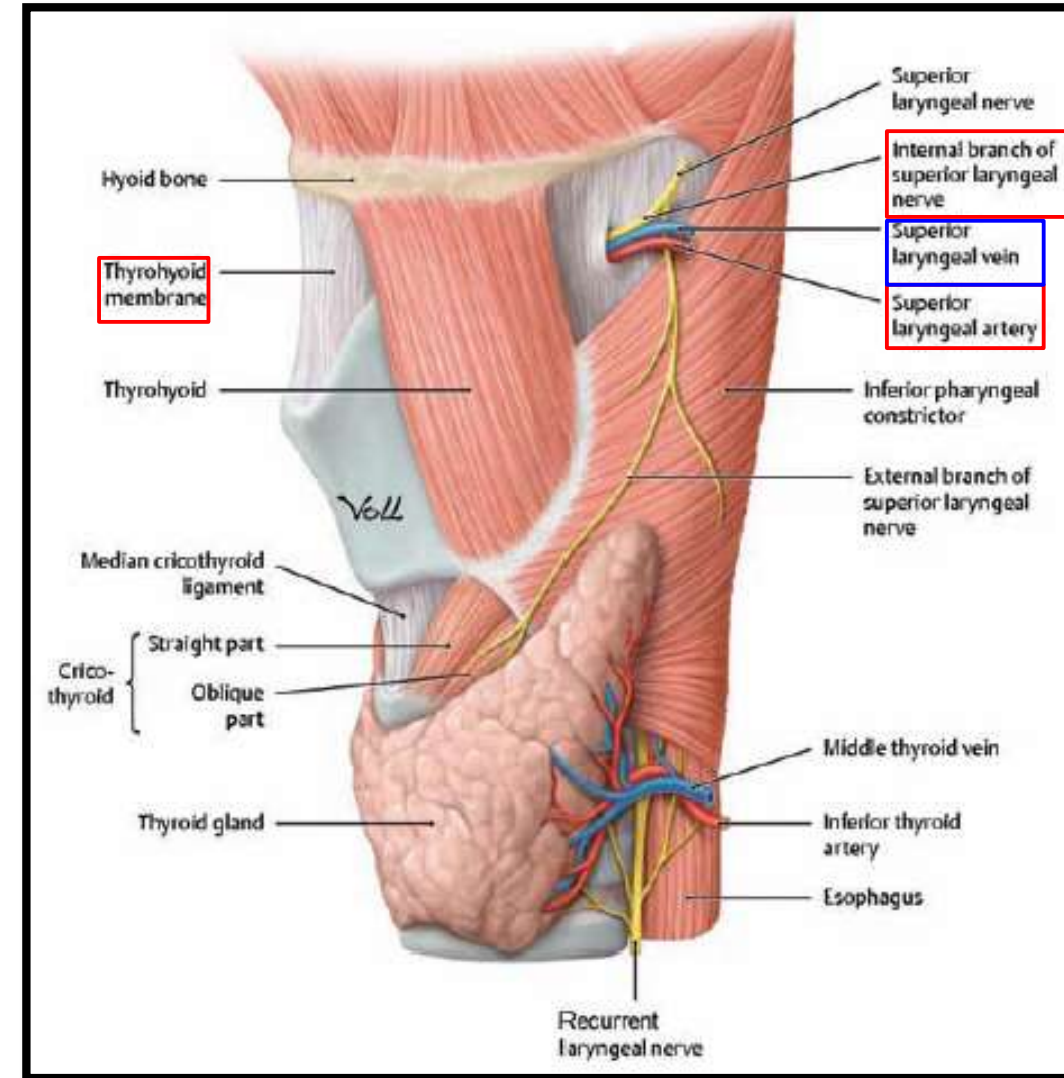
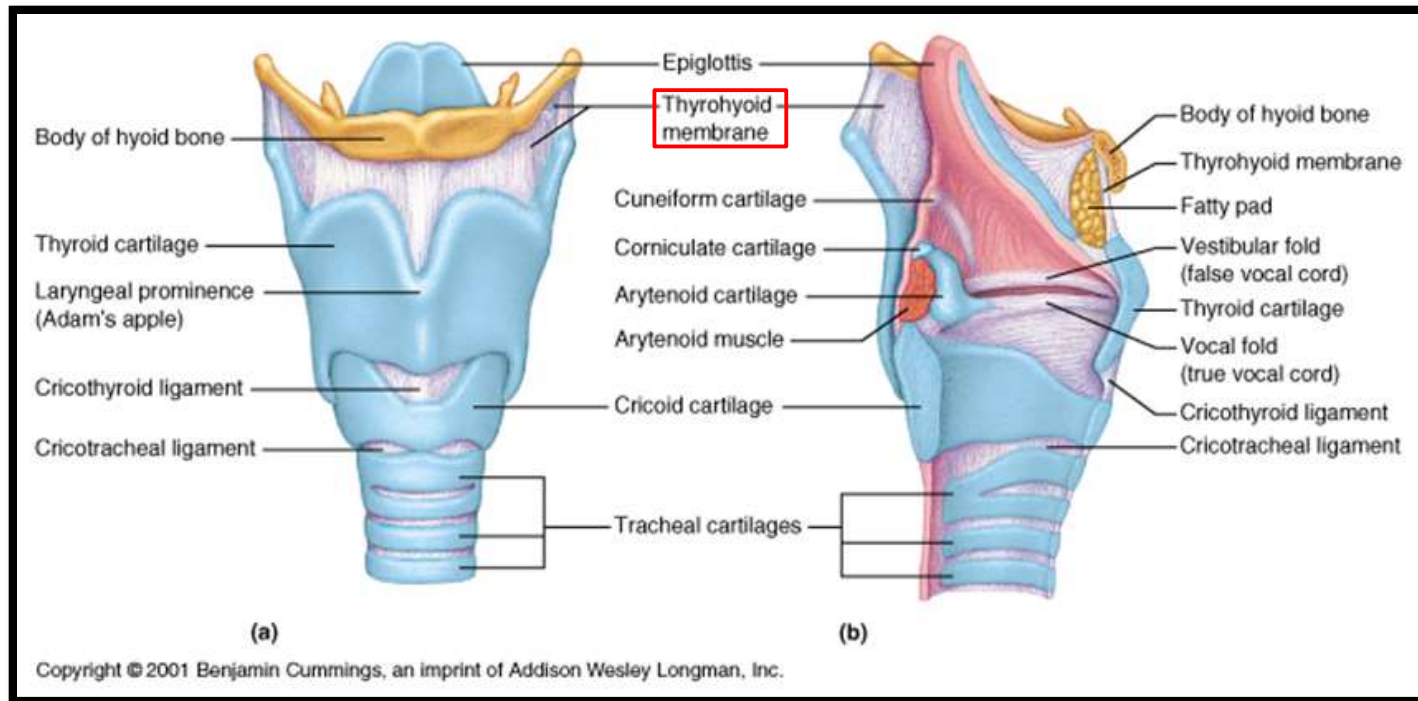
Thyrohyoid Membrane

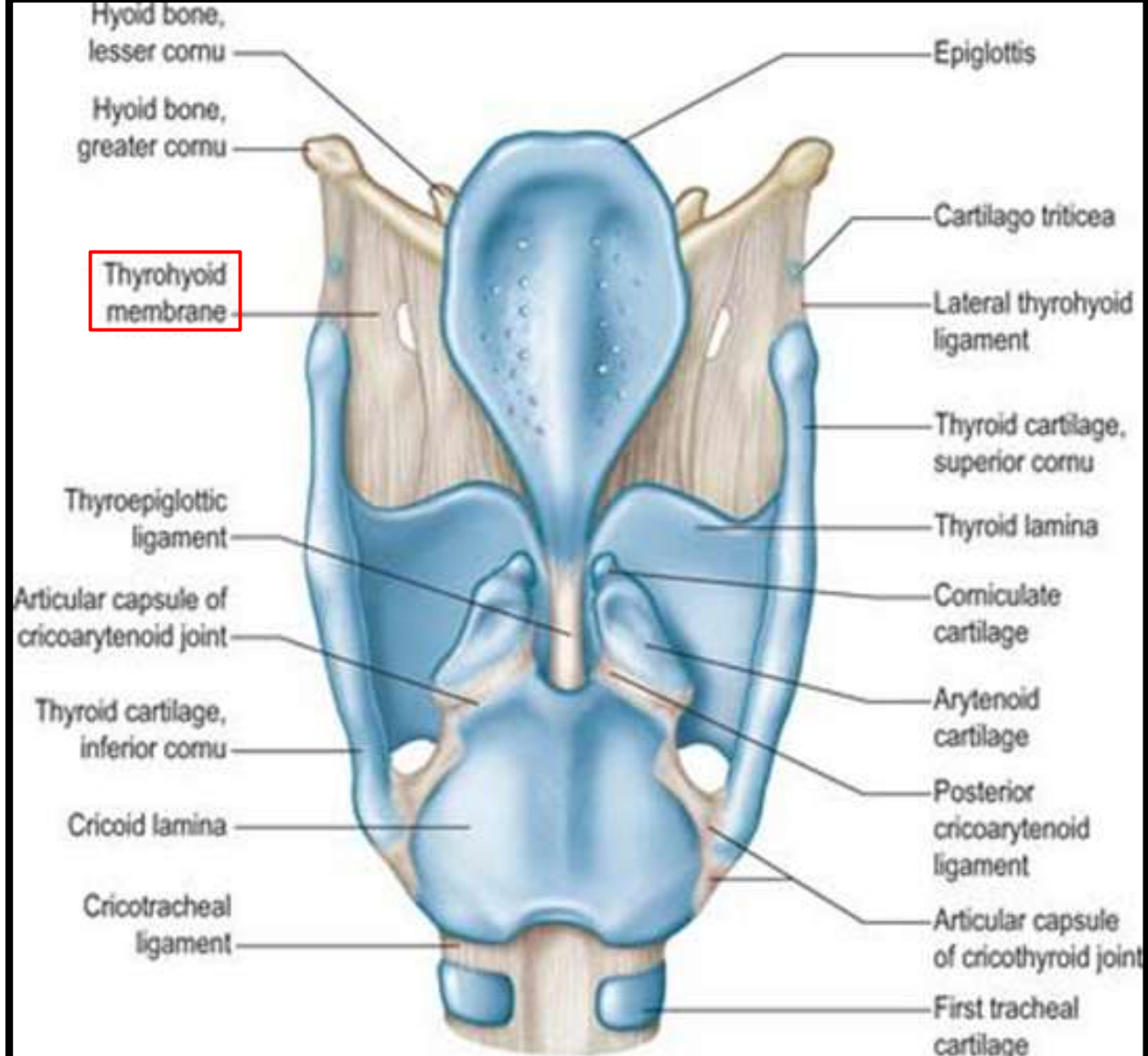
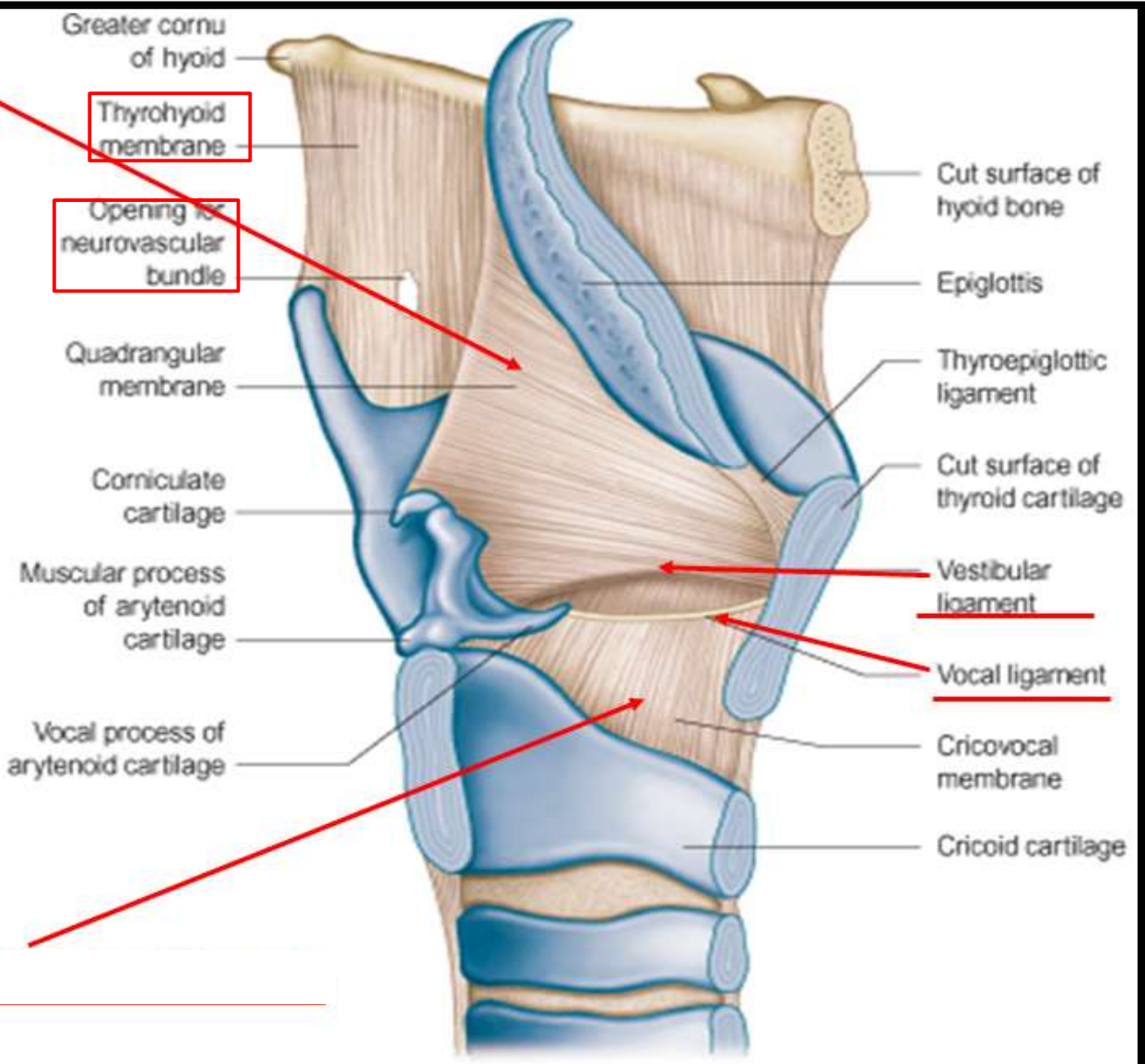
Extent-

❖ From upper border of thyroid cartilage to the upper border of hyoid bone.

❖ Pierced on either side by:

- Internal laryngeal nerve.
- Superior laryngeal vessels.



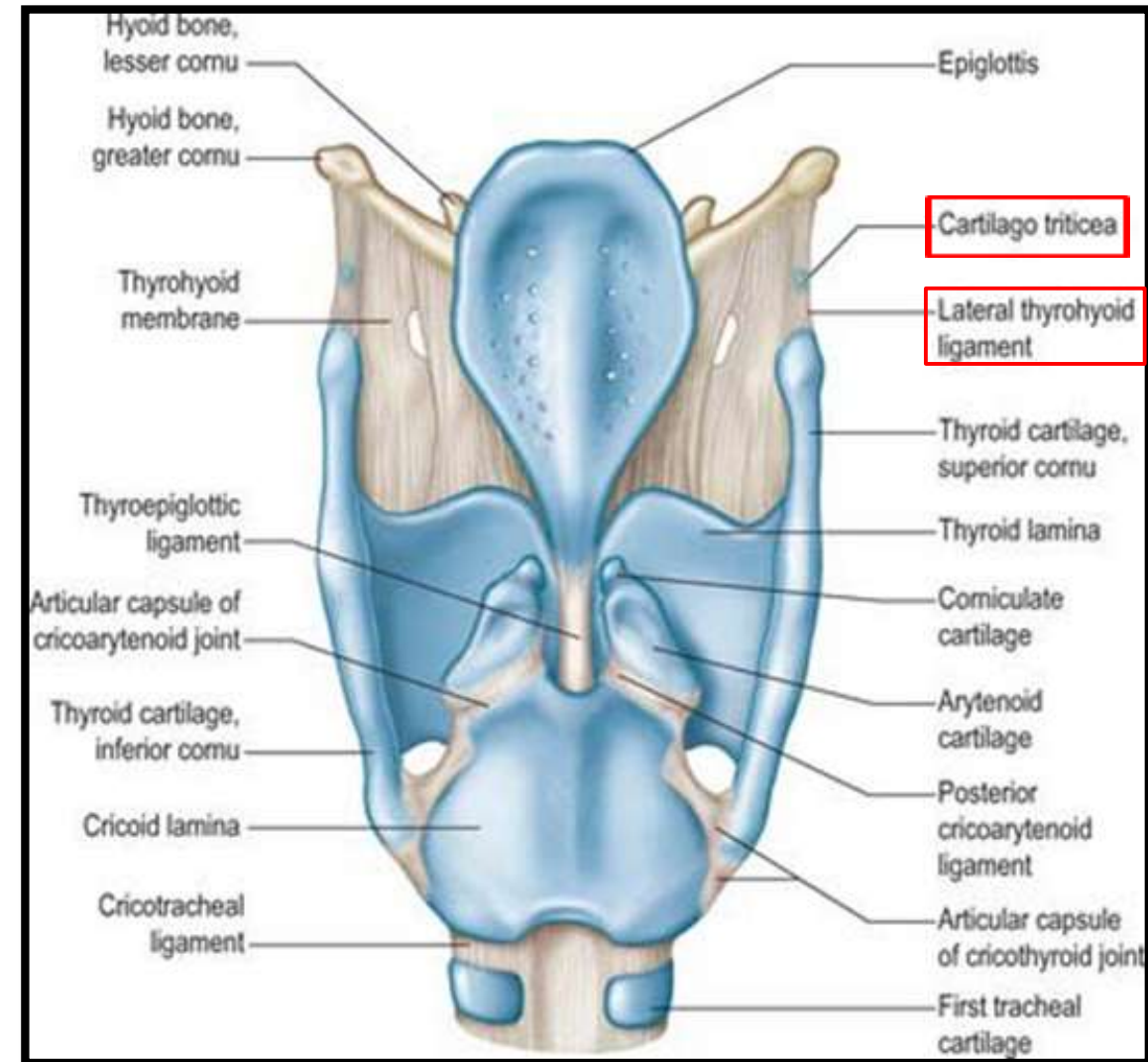
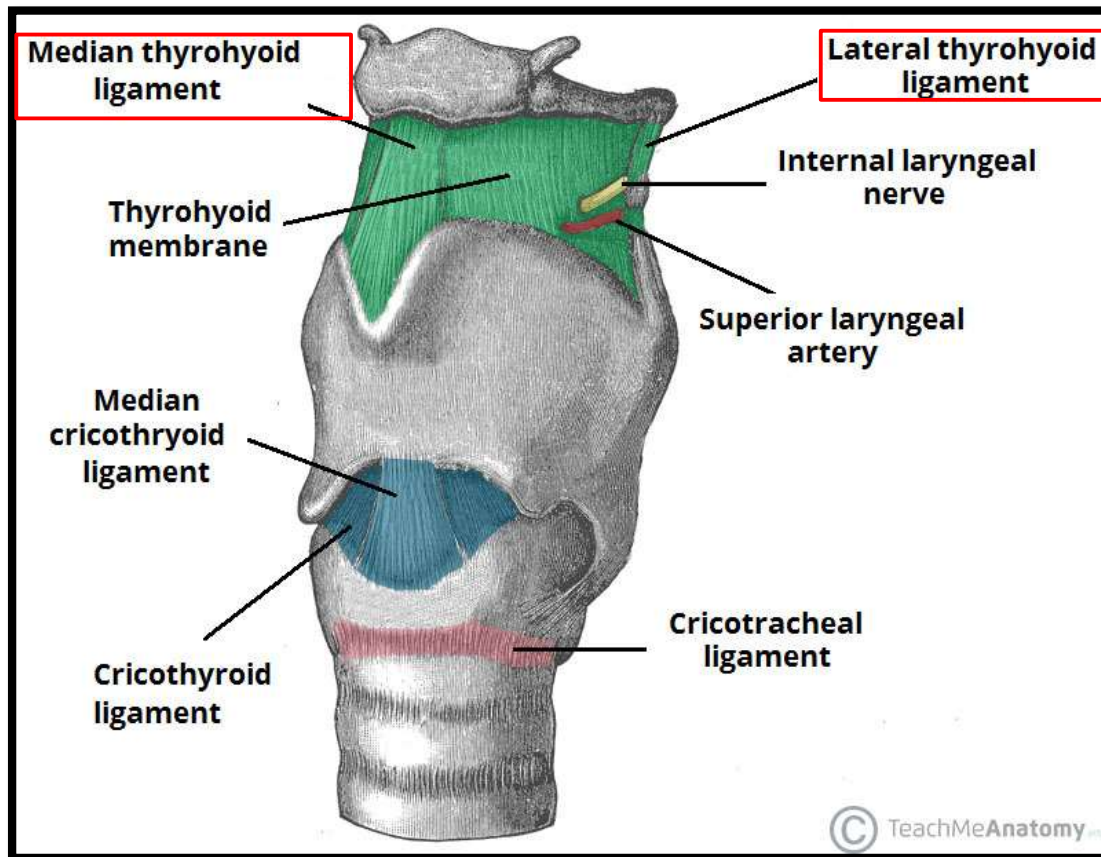


Thyrohyoid Ligaments

- 3 in number- 1 median & 2 lateral.
- Formed by the thickening of thyrohyoid membrane in median and lateral parts.

Cartilago-triticea-

- A small nodule of elastic cartilage.
- It is present in each lateral thyrohyoid ligament.



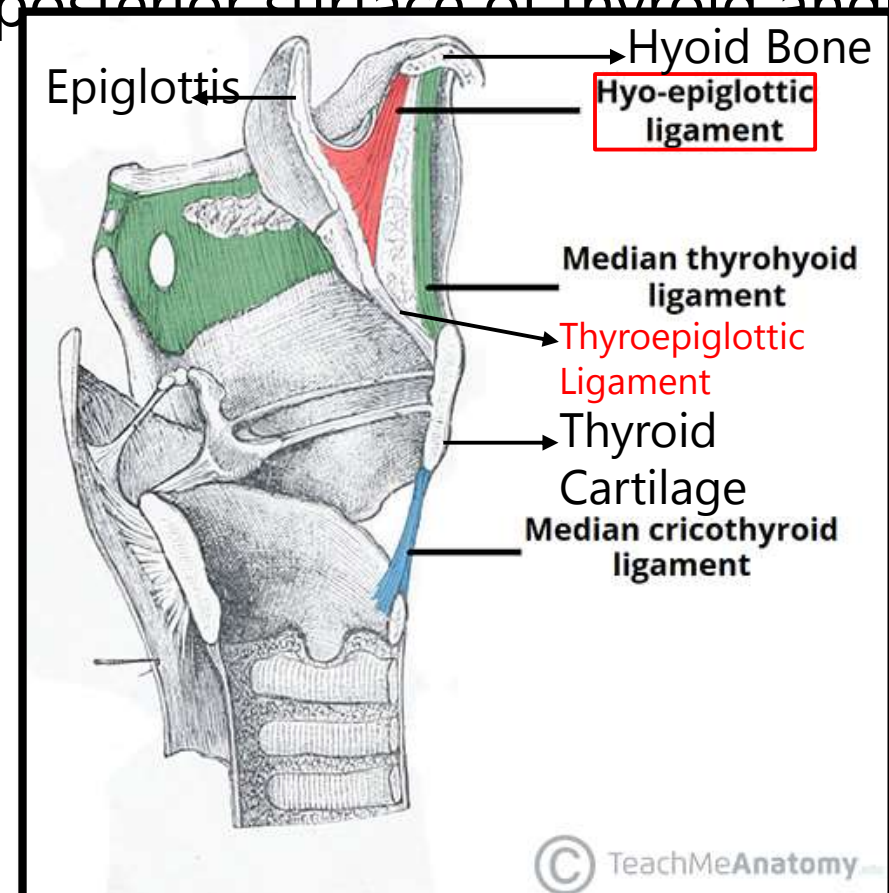
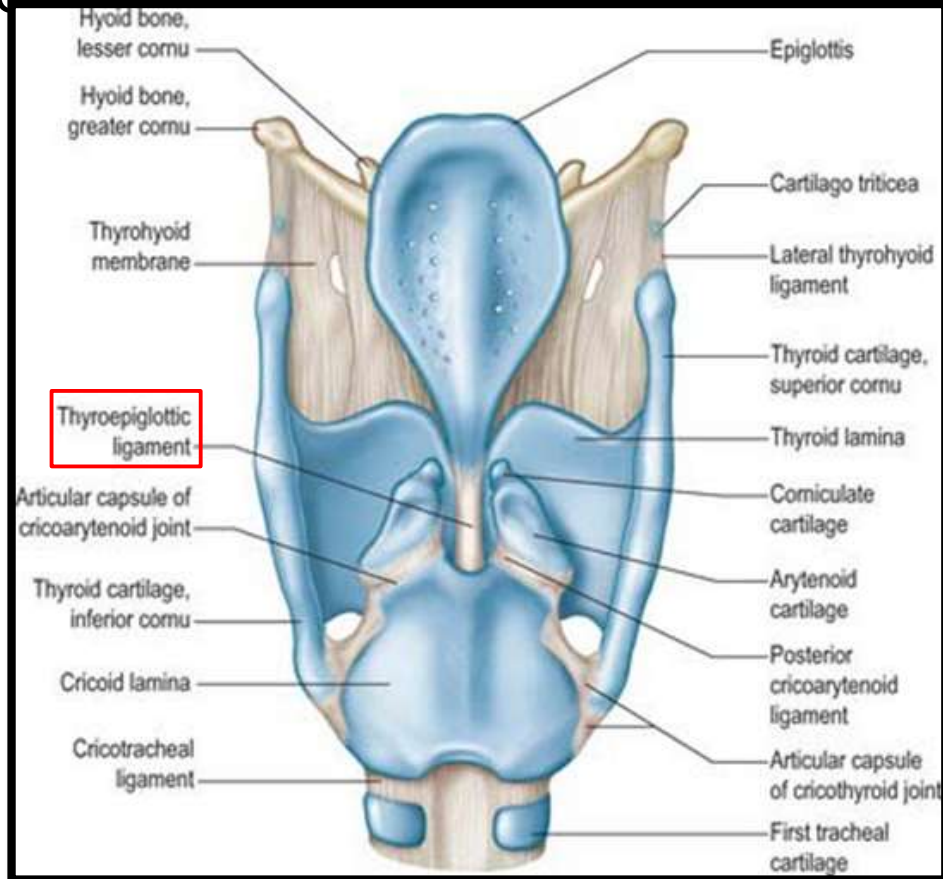
Extrinsic Ligaments & Membranes contd...

Hyoepiglottic ligament-

- Connects posterior aspect of hyoid bone with the anterior surface of upper end of epiglottis.

Thyroepiglottic ligament-

- Attaches lower narrow end of epiglottis to the posterior surface of thyroid angle.



An anatomical dissection of the larynx. The epiglottis is visible at the bottom, and the hyoepiglottic ligament is highlighted with a black circle. The surrounding tissues are pinkish-red, and the ligament is a pale, fibrous structure.

HYOEPIGLOTTIC LIGAMENT

Epiglotti
s

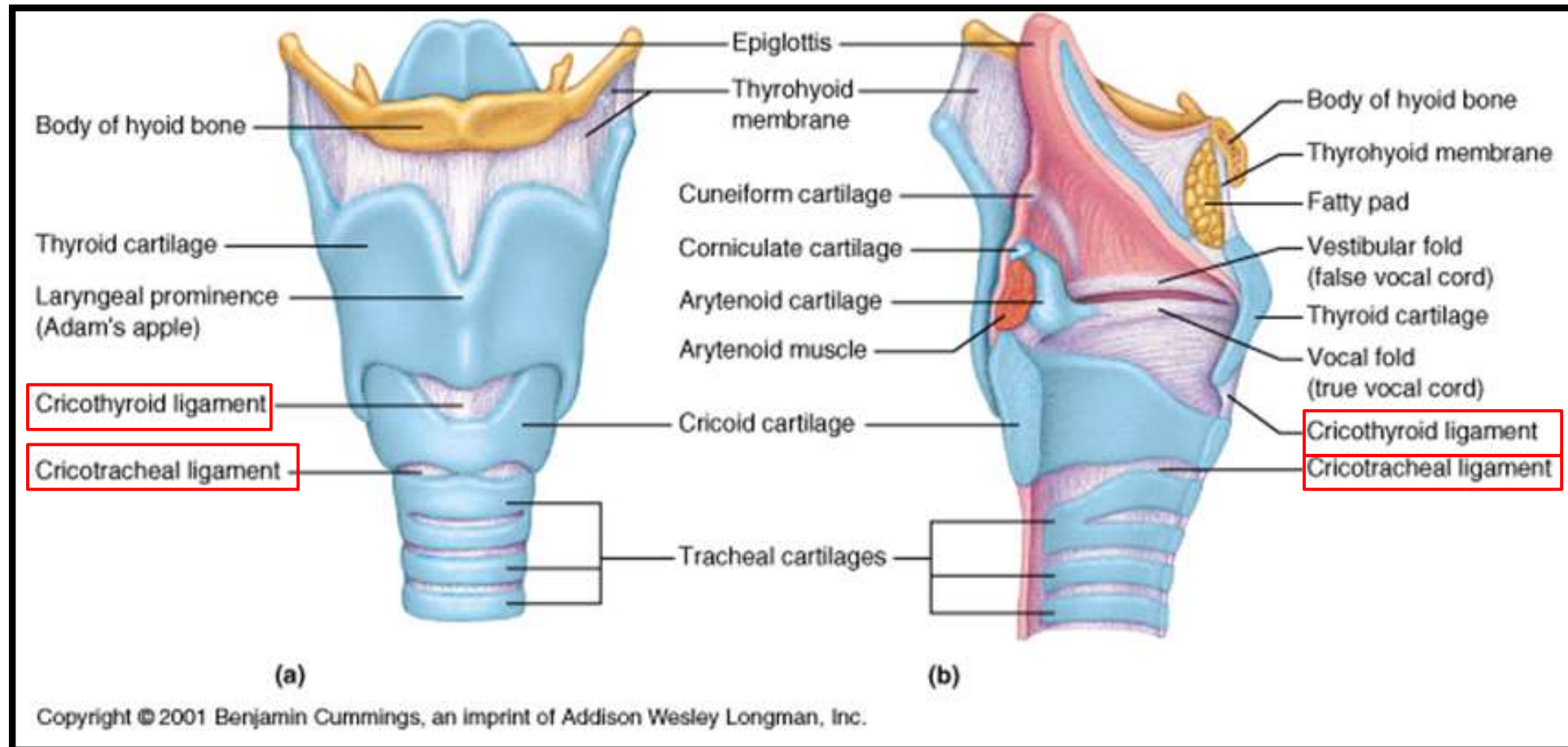
Extrinsic Ligaments & Membranes contd...

Cricothyroid ligament-

- Connects the lower border of thyroid cartilage to the cricoid cartilage in the midline.

Cricotracheal ligament-

- Connects the cricoid cartilage with the first tracheal ring.



Intrinsic Ligaments & Membranes

Membranes-

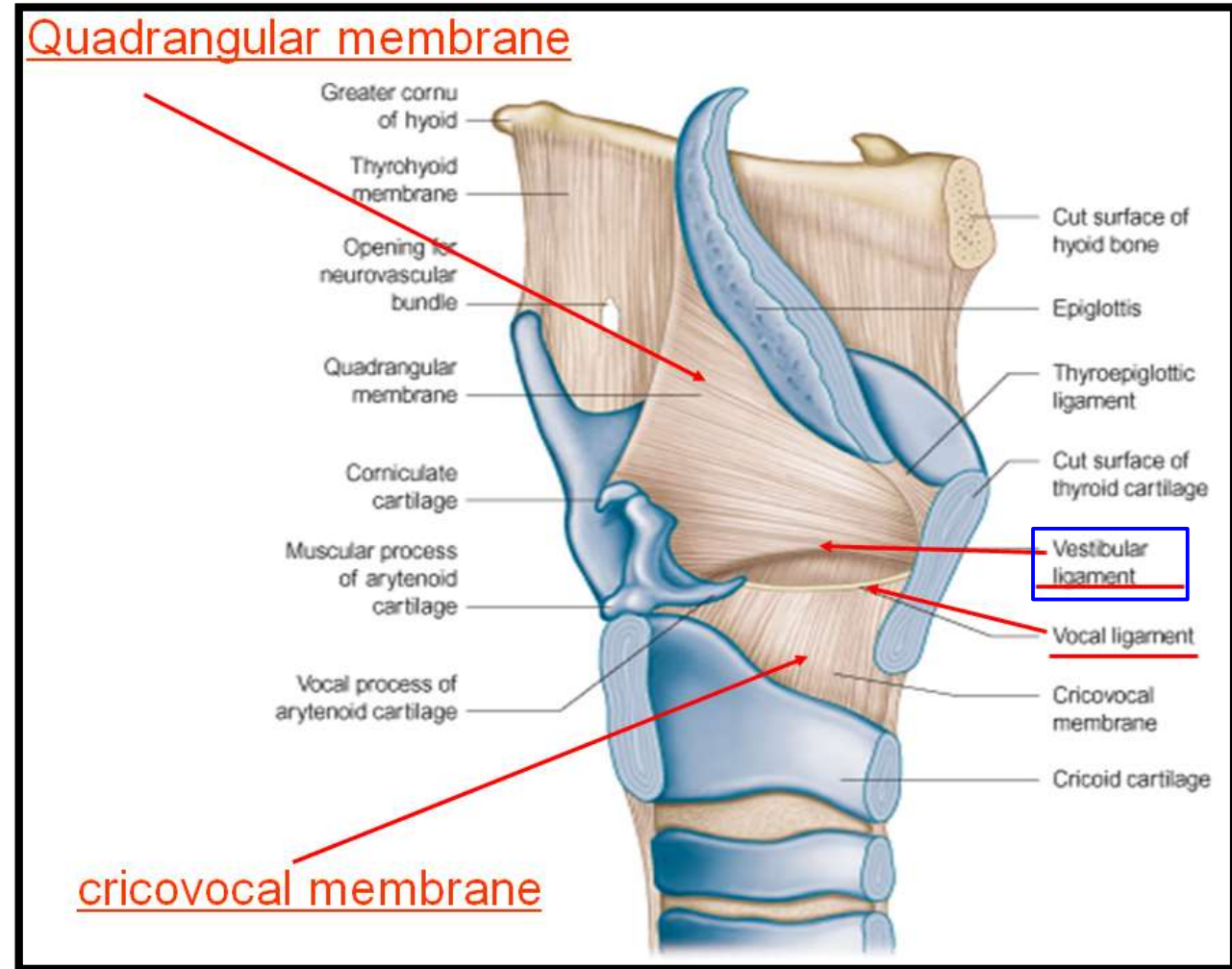
- Quadrangular (Quadrated) membrane.
- Cricovocal membrane (Conus Elasticus).

Ligaments-

- Vocal ligaments.
- Vestibular ligaments.

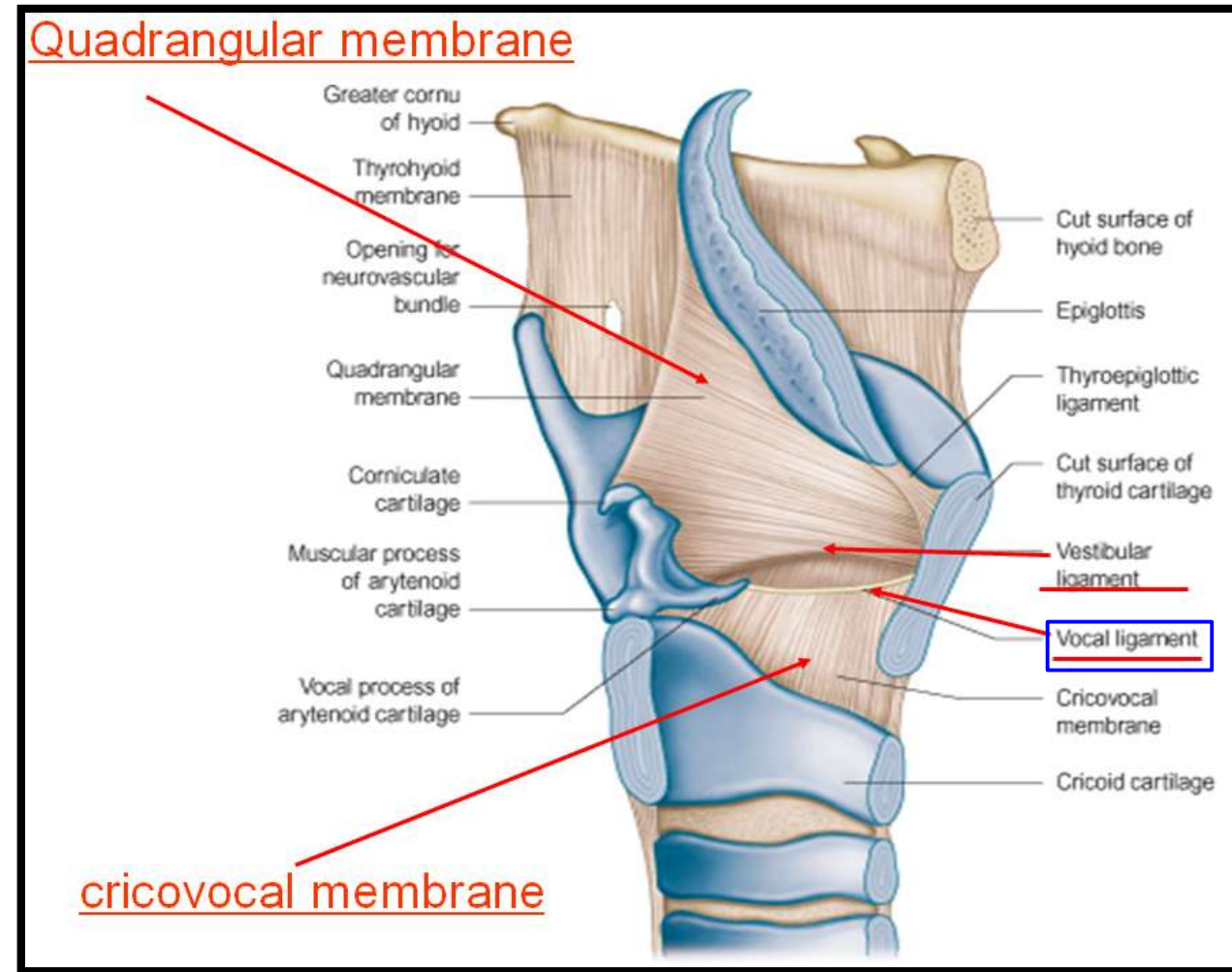
Quadrangular Membrane-

- Extends from side of epiglottis to the arytenoid cartilage.
- Its lower edge is free and is thickened to form the **Vestibular ligament**.
- Its lower free edge is attached anteriorly to the posterior surface of thyroid cartilage and posteriorly to the lateral surface of arytenoid



Cricovocal membrane (Conus Elasticus)

- Extends from upper border of arch of cricoid cartilage.
- Its upper edge is free and is thickened to form the **Vocal ligament**.
- Its upper free edge is attached anteriorly to the posterior surface of thyroid cartilage and posteriorly to the vocal process of arytenoid cartilage.



Vocal fold-

A fold of mucous membrane over vocal ligament

Muscles

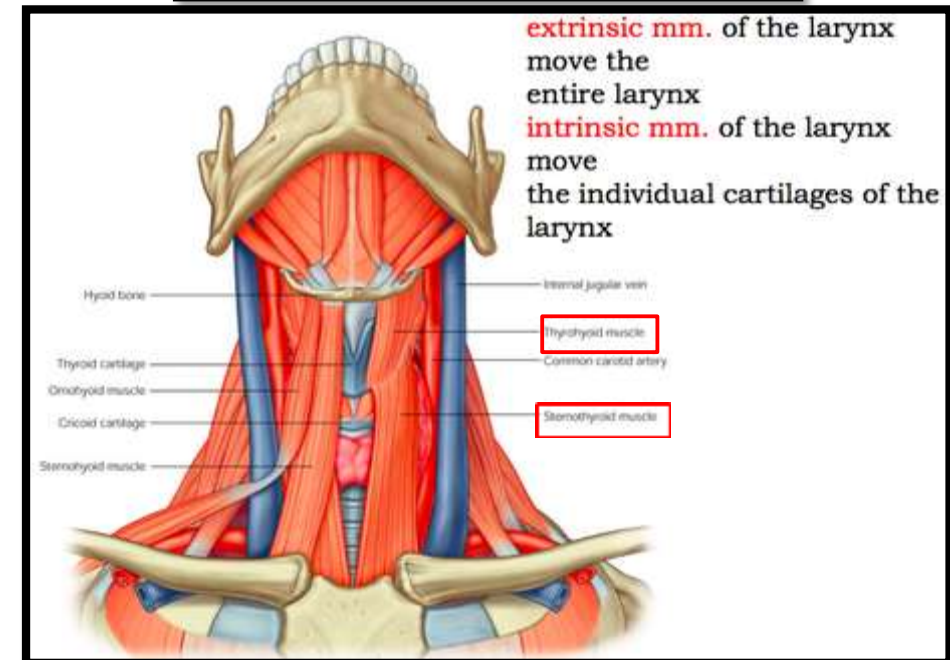
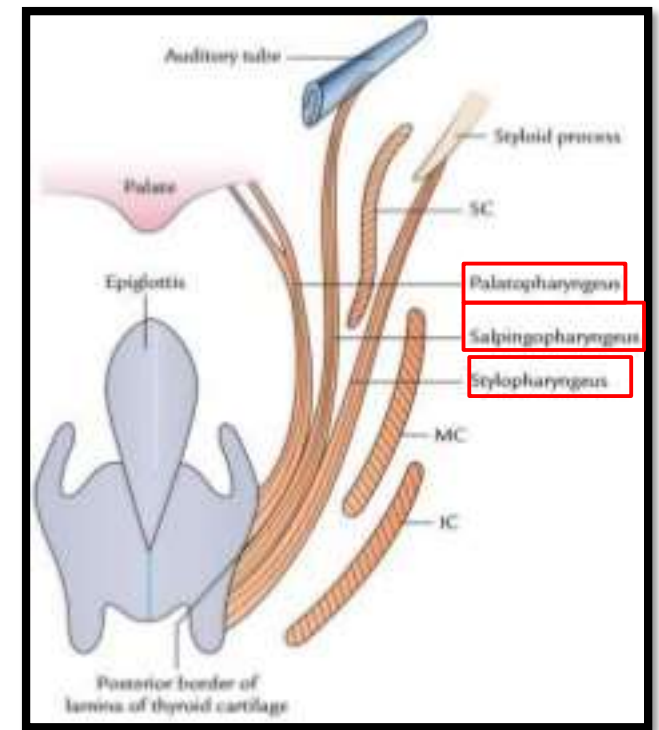
- Extrinsic.
- Intrinsic.

Extrinsic Muscles-

- ❖ Attach the larynx to the surrounding structures.
- ❖ All are paired.
- ❖ Include:

- Palatopharyngeus.
- Salpingopharyngeus.
- Stylopharyngeus.
- Sternothyroid.
- Thyrohyoid.

- ❖ All these muscles elevate the larynx **except** Sternothyroid, which depress the larynx.

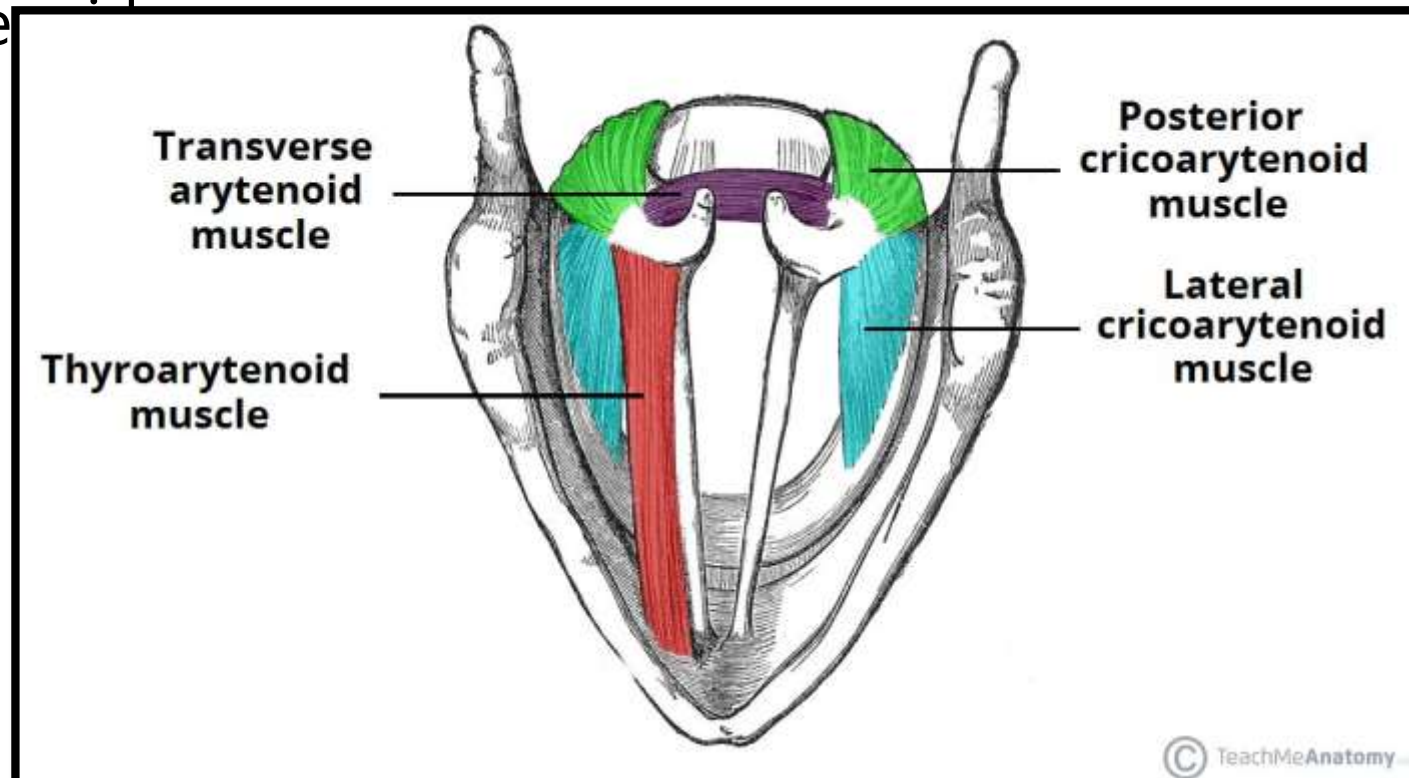


Intrinsic Muscles

- These muscles attach the laryngeal cartilages to each other.
- These are responsible for the movements of laryngeal.
- All are paired except Transverse Arytenoid which is unpaired.

Functions-

- Open and close the laryngeal inlet.
- Adduct and abduct the vocal cords.
- Increase and decrease the tension of vocal



Intrinsic Muscles That Open and Close the Laryngeal Inlet

Muscles that open the Laryngeal Inlet-

- Thyroepiglotticus

Muscles that close the Laryngeal Inlet-

- Oblique arytenoids.

Grays Anatomy 20th Ed, 1918 (copyright free) Fig. 959
Ch.11, p.256

Aryepiglottic

-apex arytenoid to side of epiglottis

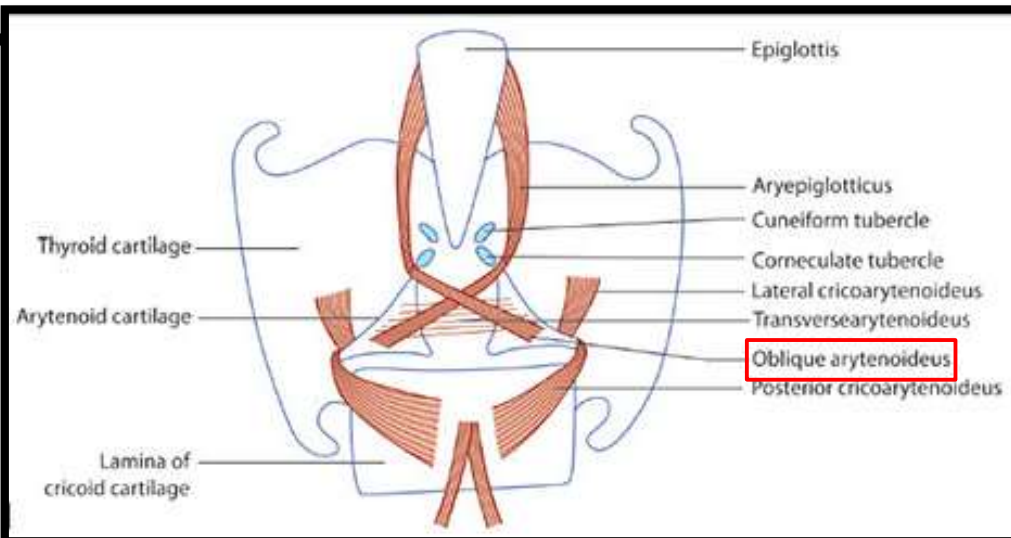
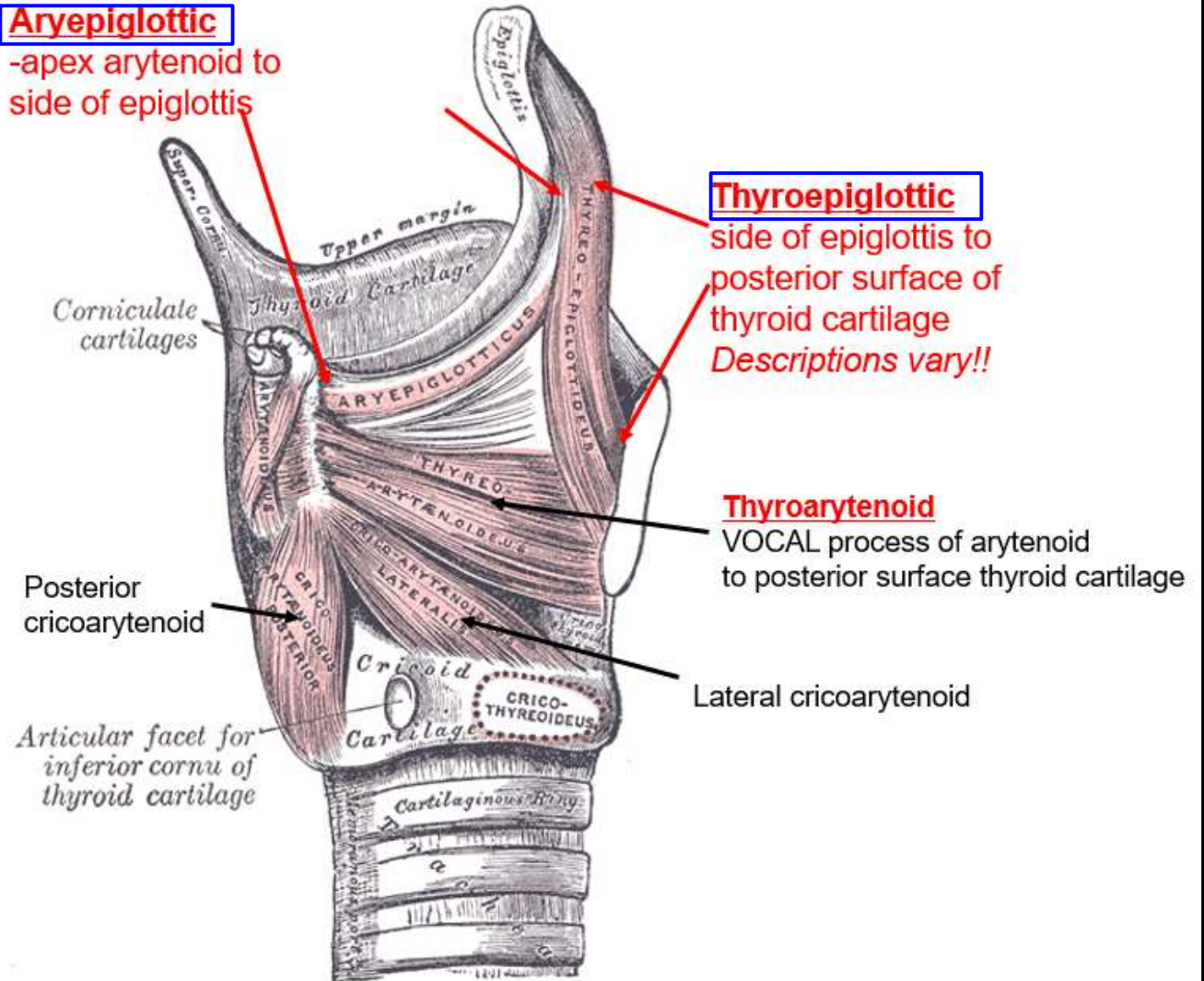
Thyroepiglottic

side of epiglottis to posterior surface of thyroid cartilage
Descriptions vary!!

Thyroarytenoid

VOCAL process of arytenoid to posterior surface thyroid cartilage

Lateral cricoarytenoid



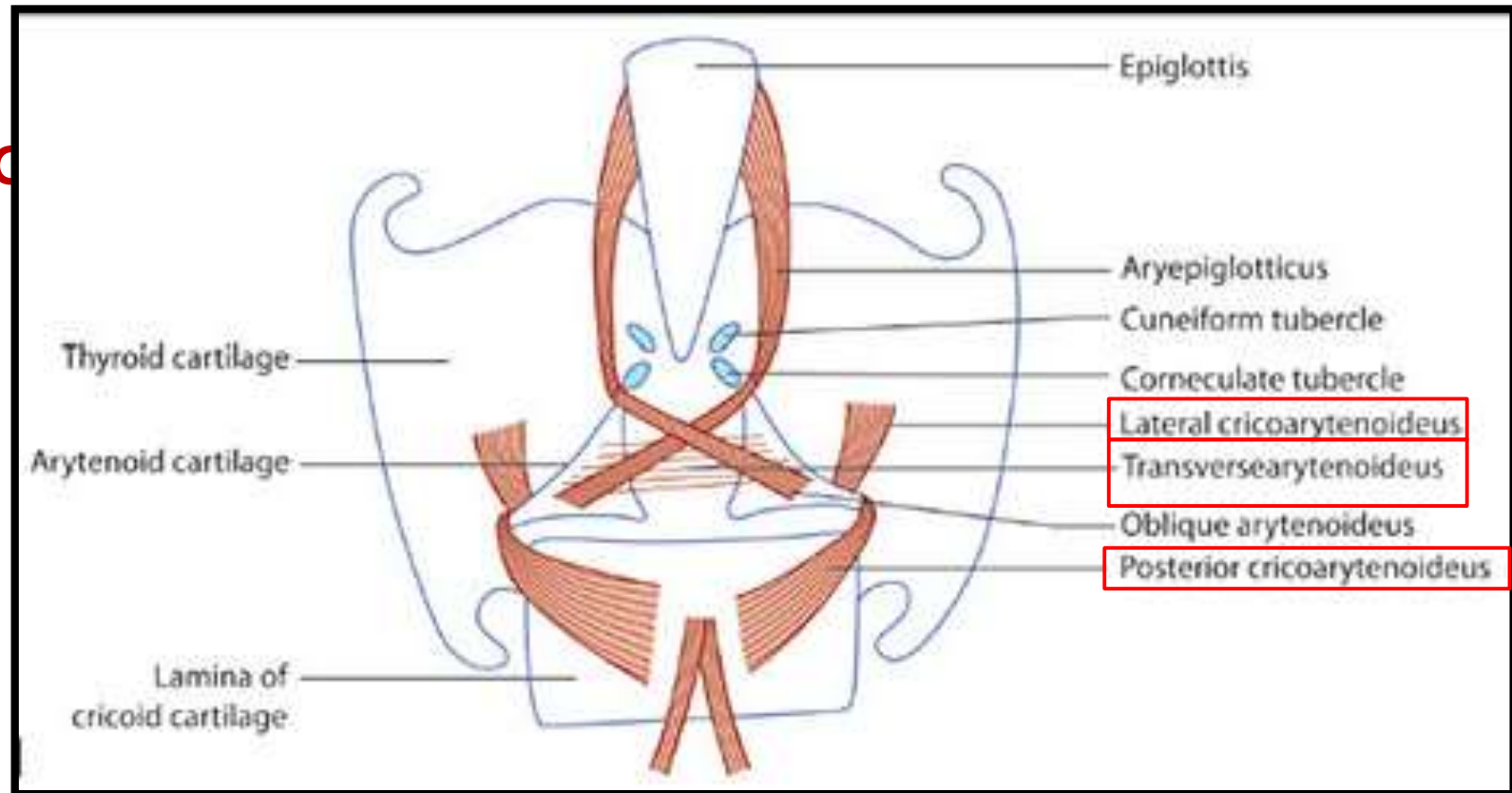
Intrinsic Muscles That Adduct and Abduct the Vocal Cords

Muscles that abduct the Vocal Cords-

- Posterior Cricoarytenoids.

Muscles that adduct the Vocal Cords-

- Lateral Cricoarytenoids.
- Transverse arytenoid.



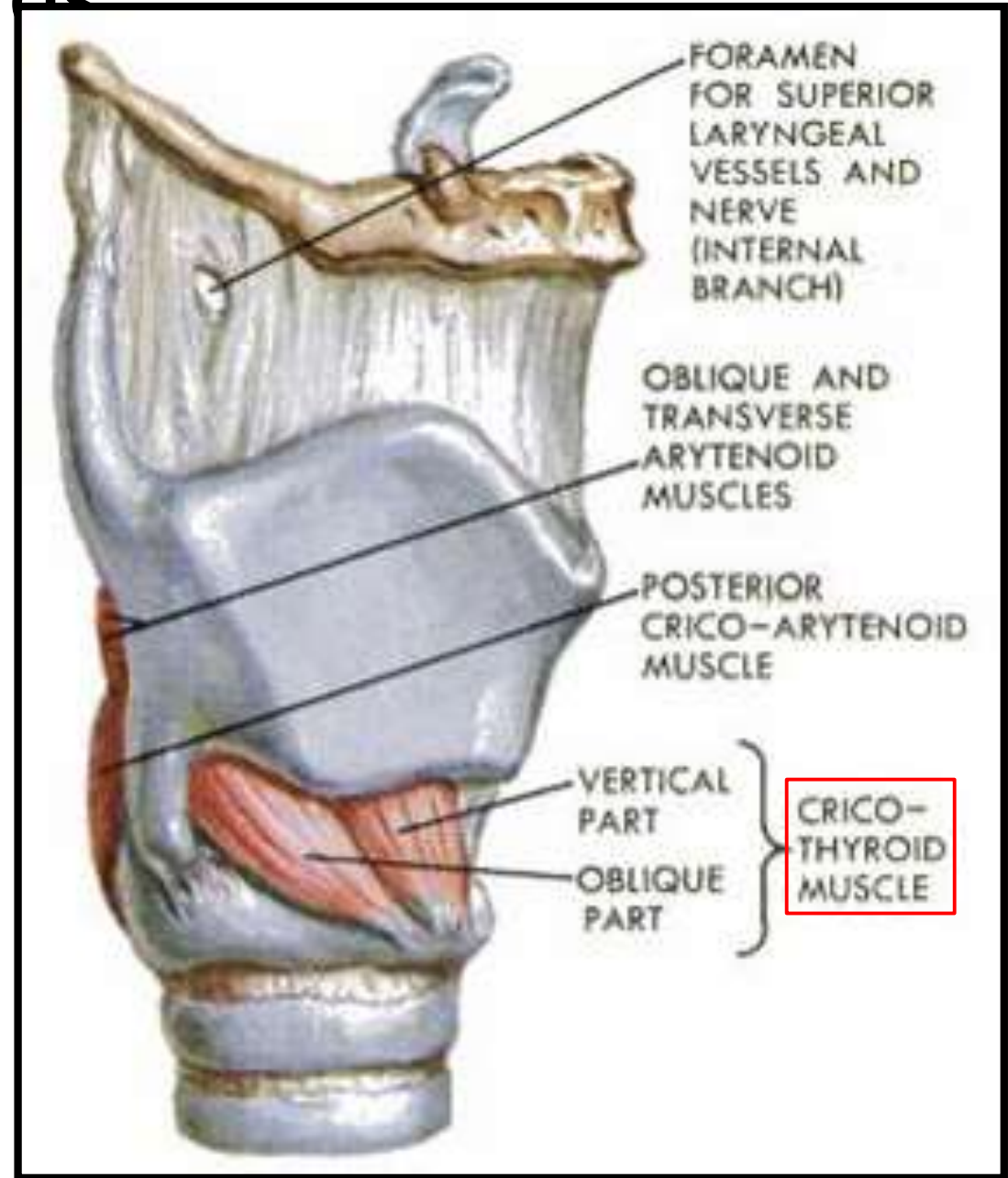
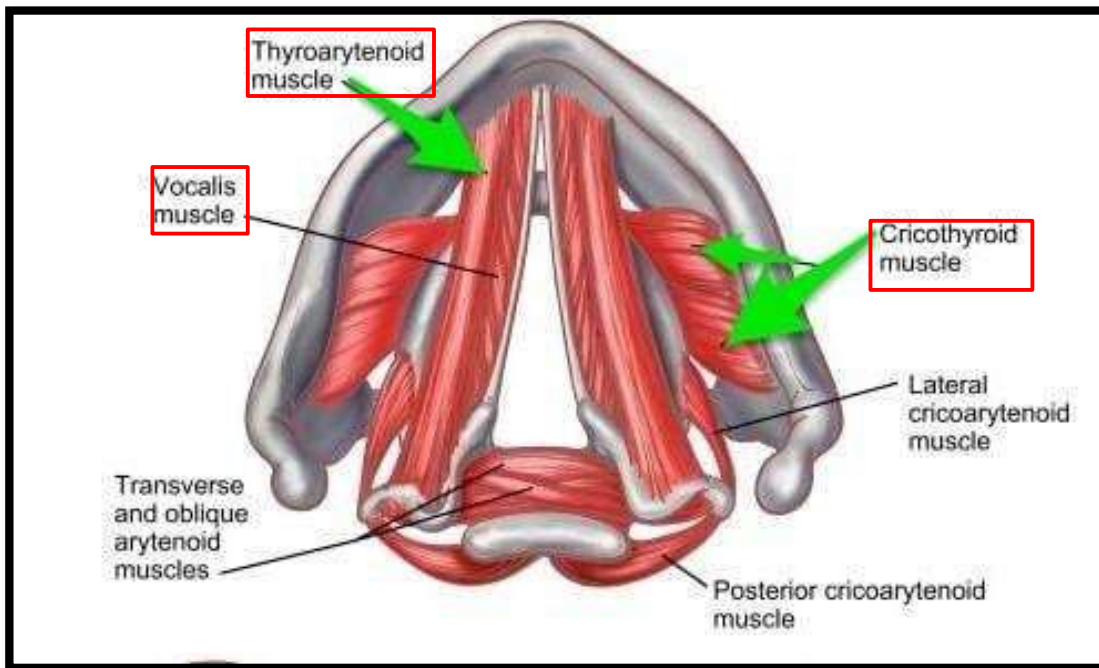
Intrinsic Muscles That Increase and Decrease the Tension of Vocal Cords

Muscles that tense the Vocal Cords-

- Cricothyroids.
- Vocalis.

Muscles that relax the Vocal Cords-

- Thyroarytenoids.



Cricothyroid Muscle

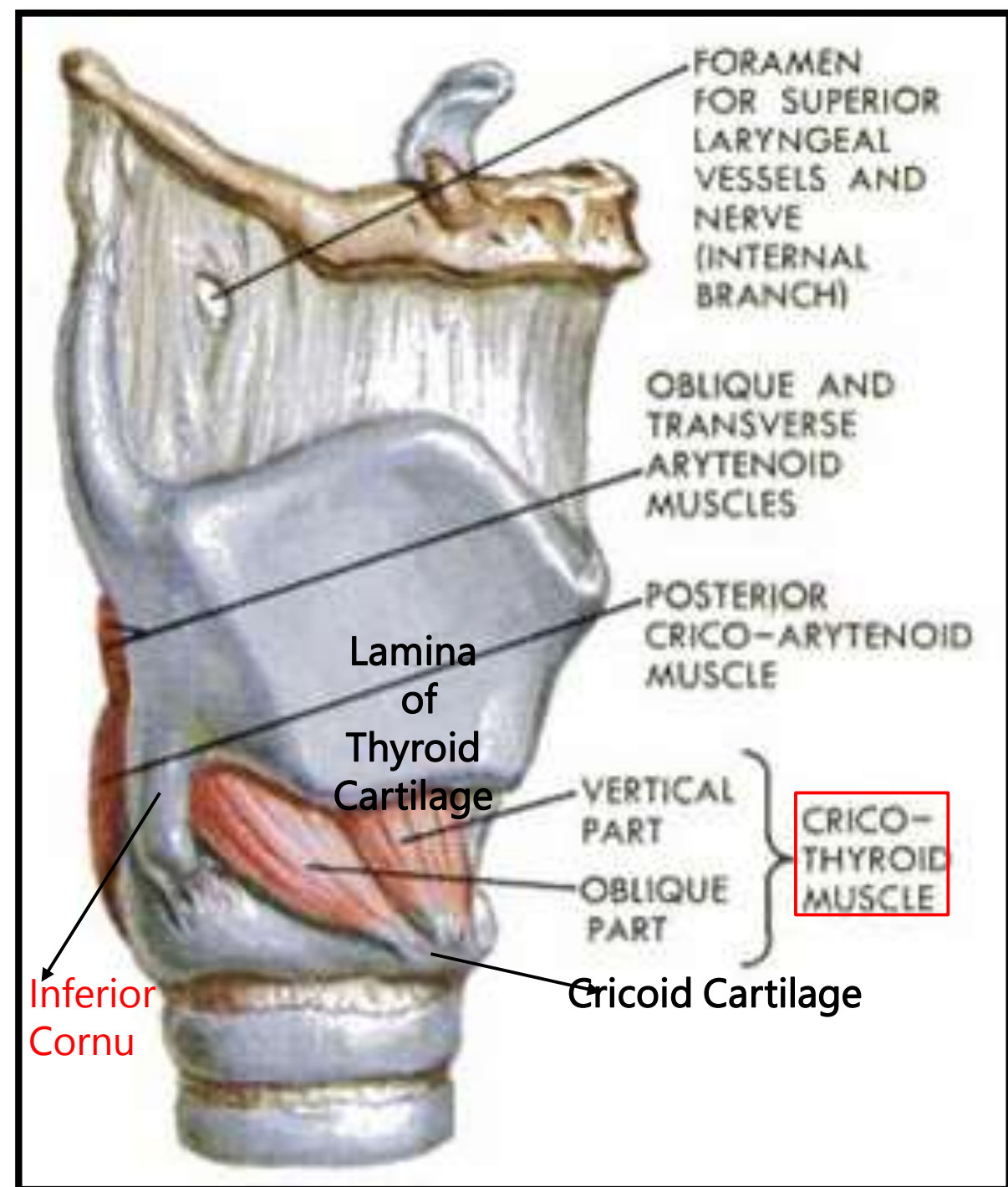
- It is the only intrinsic muscle of larynx which lies on external aspect of larynx.
- A small fan-shaped muscle.
- It is an important muscle for the **tone** and **pitch** of the voice.
- It is also known as '**Tuning Fork of Larynx**'.

Origin-

- Anterolateral aspect of Cricoid cartilage.

Insertion-

- Inferior cornu and adjacent lower border of lamina of Thyroid cartilage.



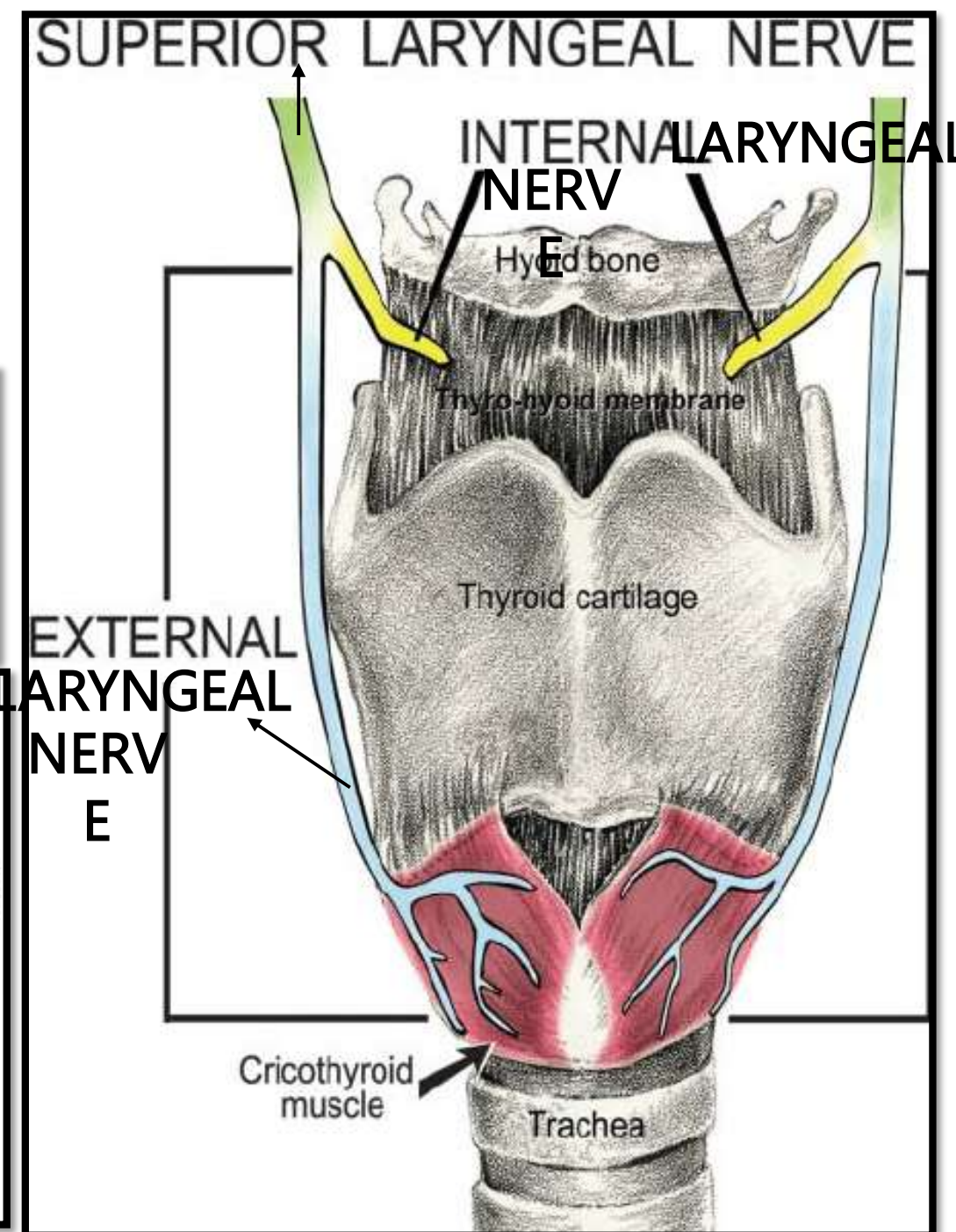
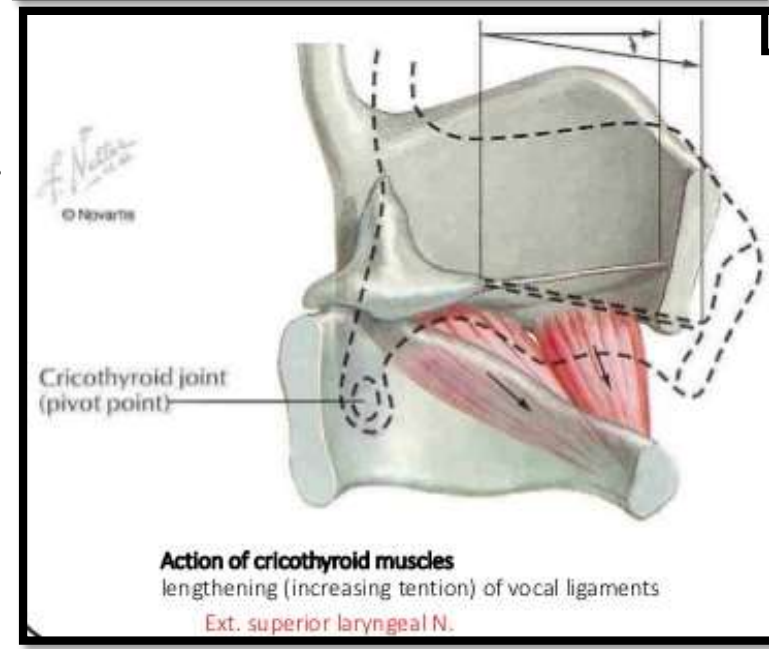
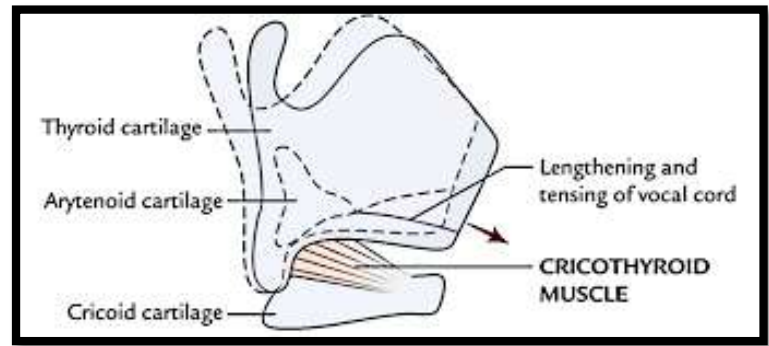
Cricothyroid Muscle contd...

Nerve Supply-

- External Laryngeal Nerve (branch of Superior Laryngeal Nerve).

Actions-

- Downward and forward movement of thyroid cartilage.
- Lengthening and tensing the vocal cords.

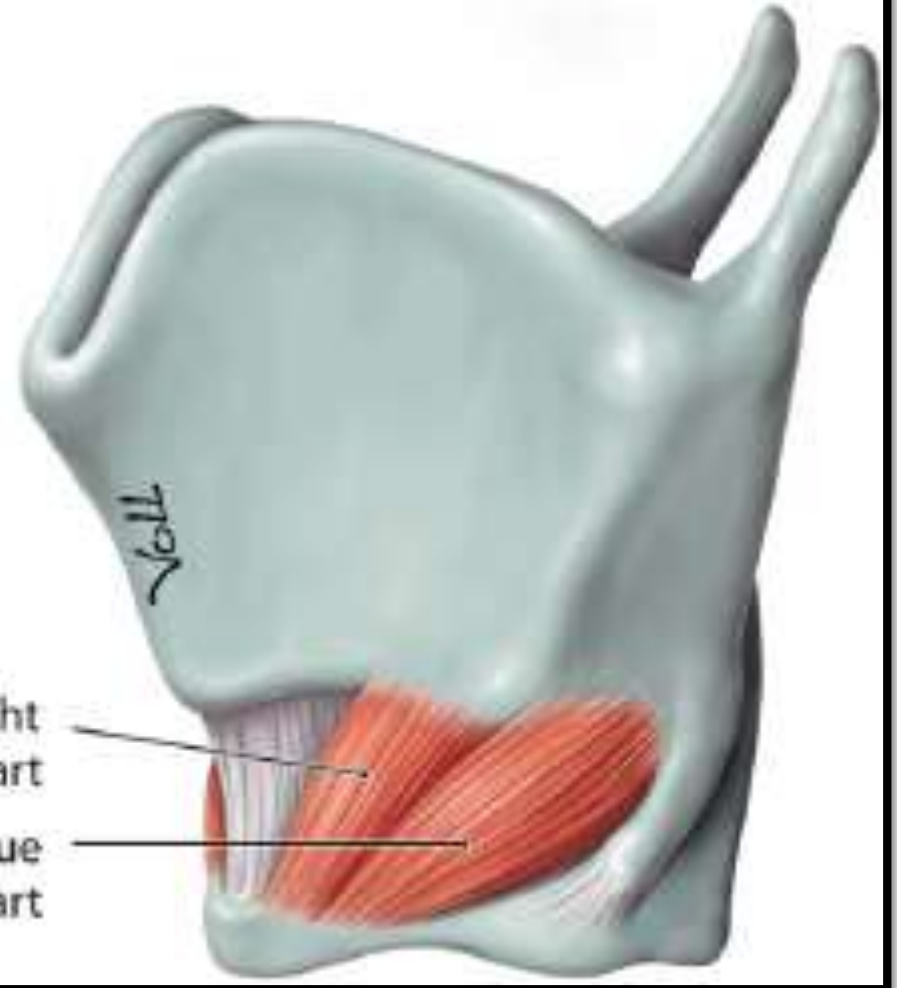
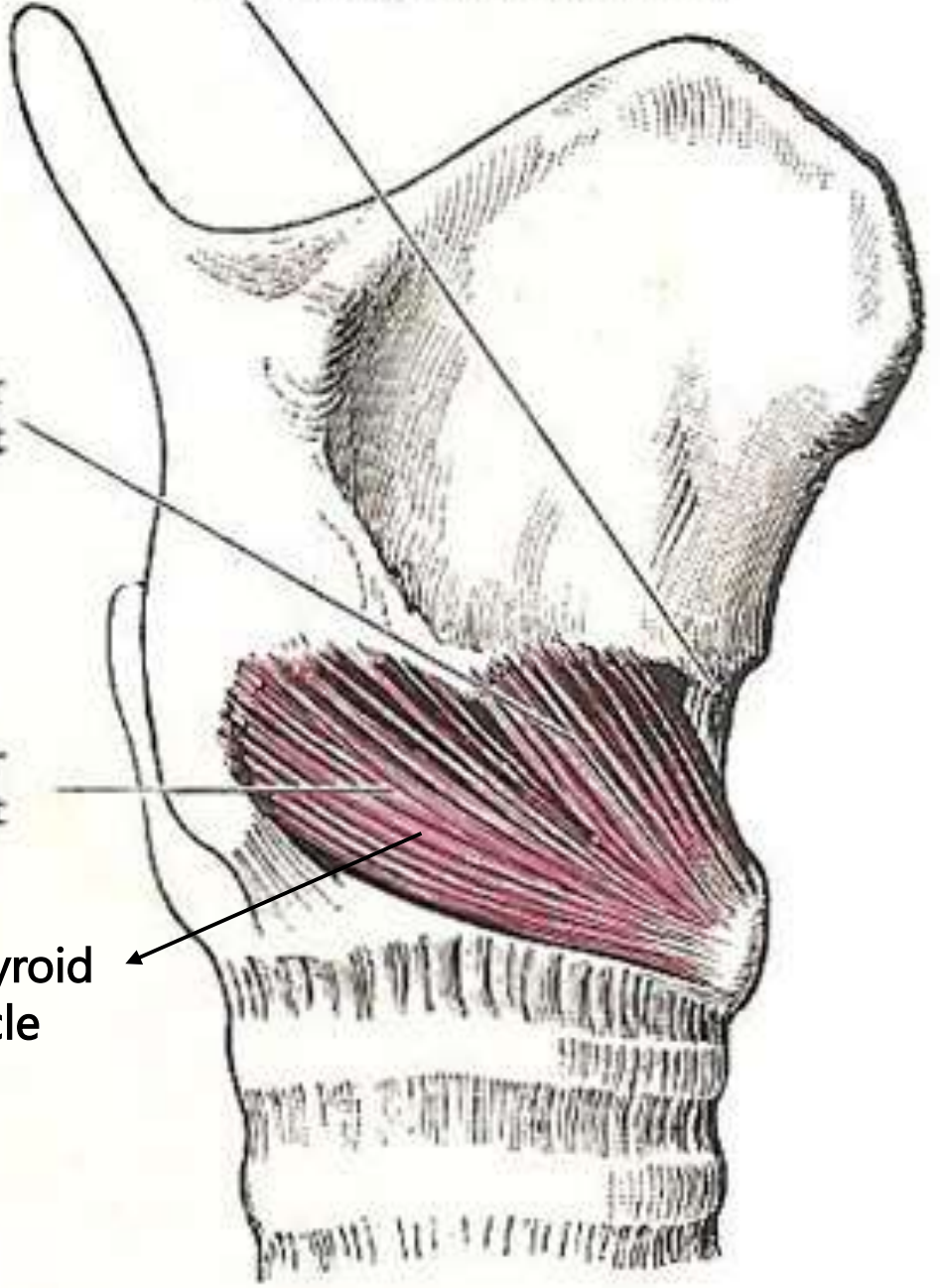


Crico-thyroid ligament

Anterior part

Posterior part

Cricothyroid Muscle



Crico-thyroid

Straight part

Oblique part



Vocalis Muscle

- It is the detached medial part of Thyroarytenoid muscle.
- It lies within the vocal fold, just lateral and cranial to the vocal ligament.

Origin-

- Posterior aspect of thyroid angle and anterior part of vocal ligament.

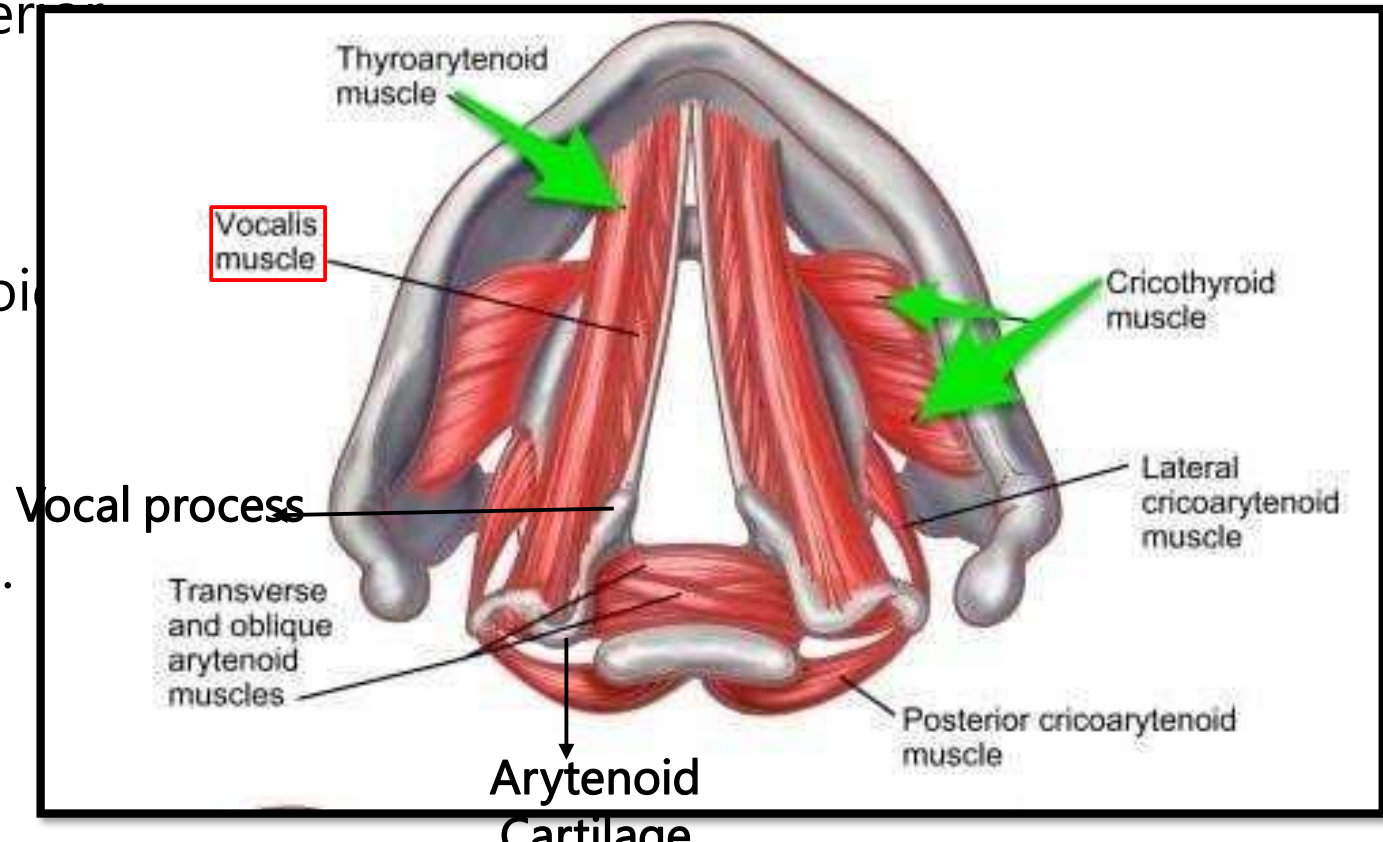
Insertion-

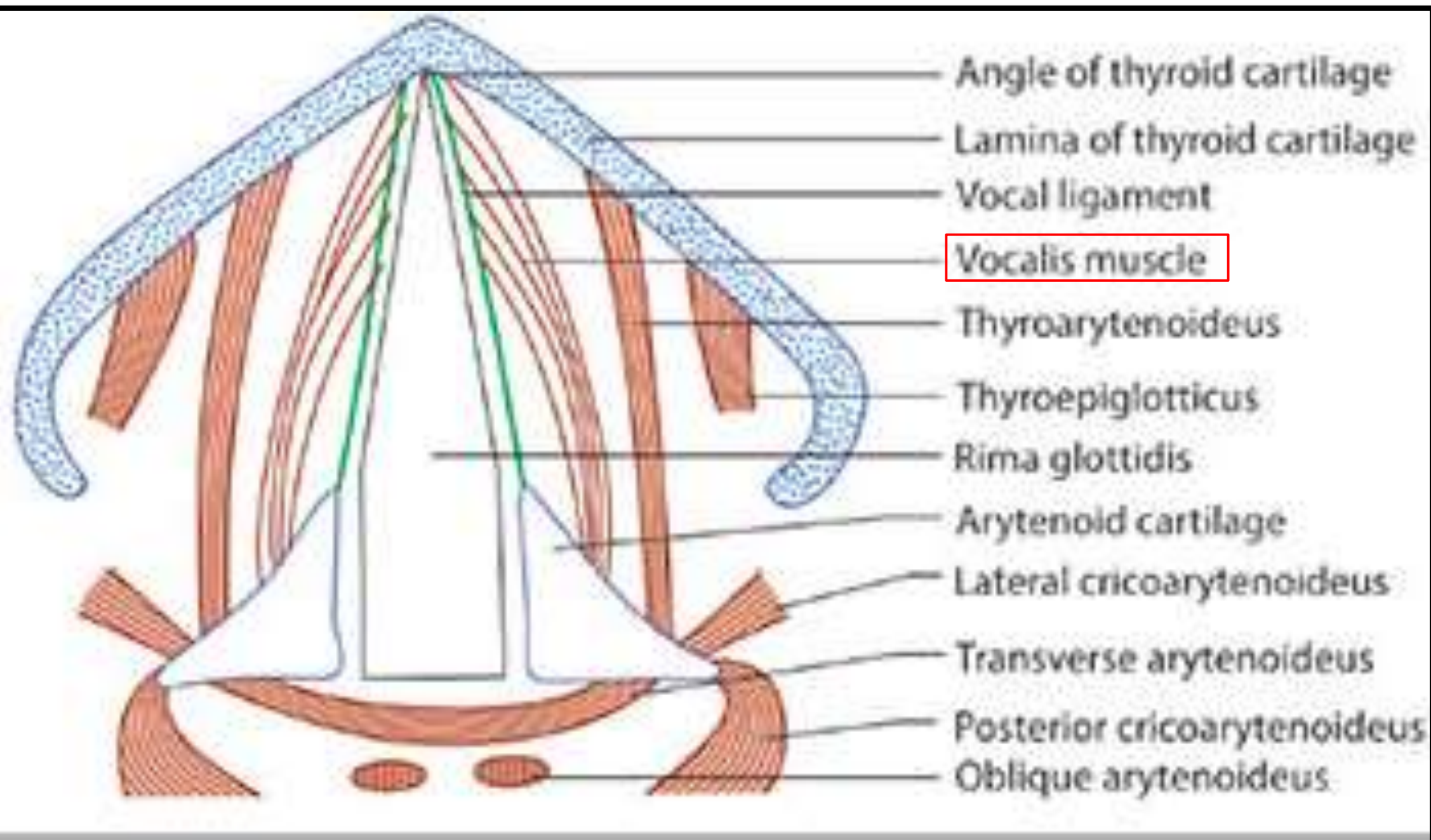
- Lateral surface of vocal process of arytenoid cartilage.

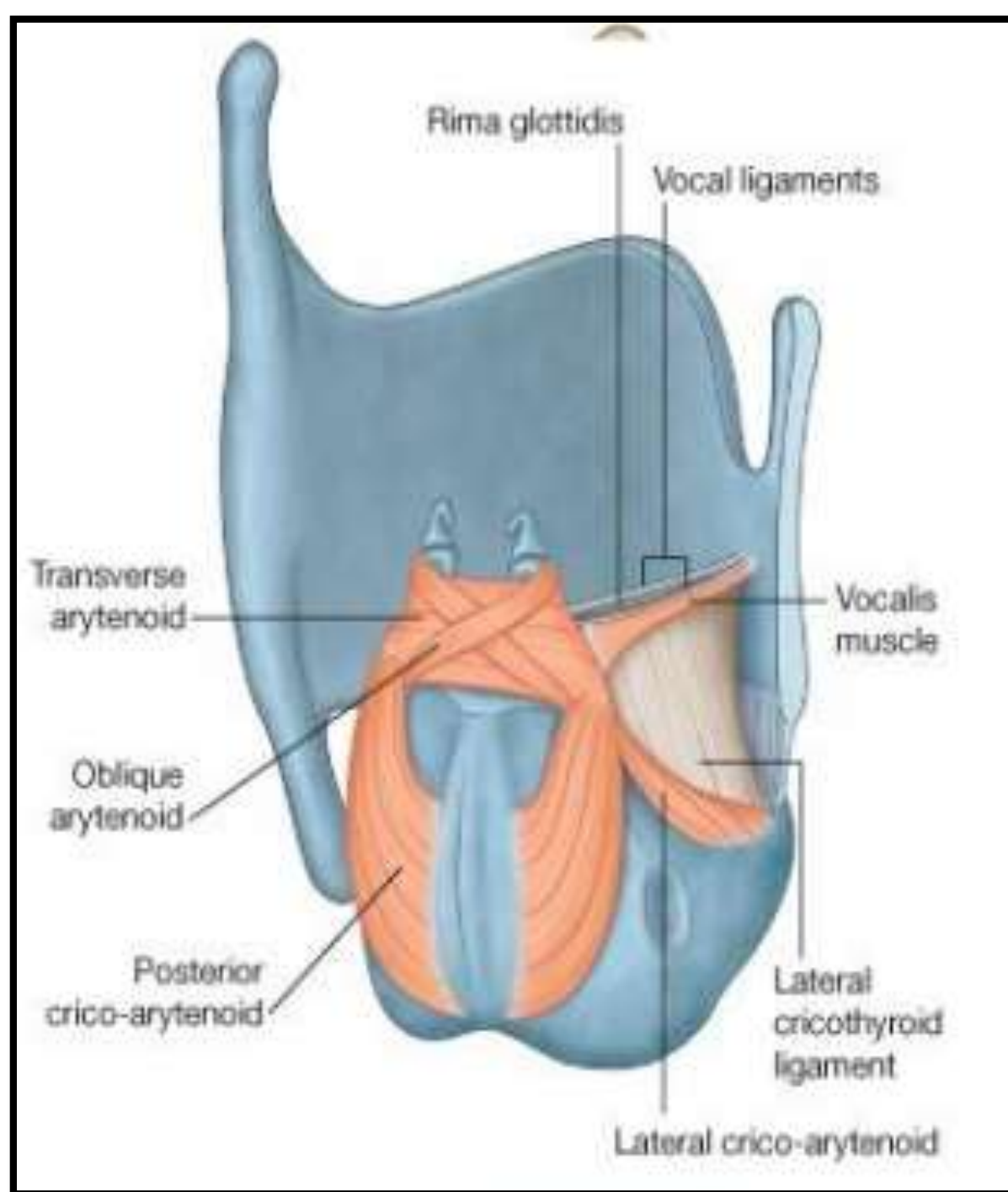
Action-

- Tenses the anterior part of vocal ligament.
- Helps in **modulation** of voice.

Nerve Supply-







Posterior Cricoarytenoid Muscle

- It is a **triangular** muscle.
- It is the **only abductor** of vocal cords.
- It is called '**Safety Muscle of the Larynx**'.

Origin-

- Posterior surface of Cricoid lamina, lateral to its median ridge.

Insertion-

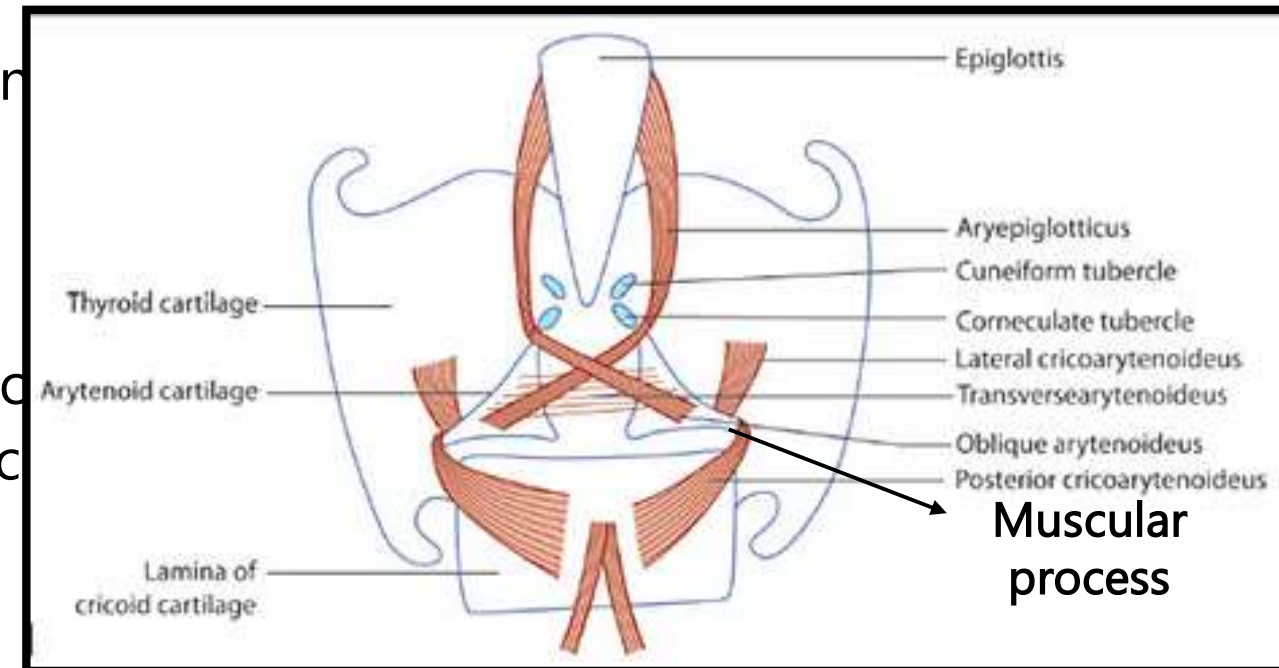
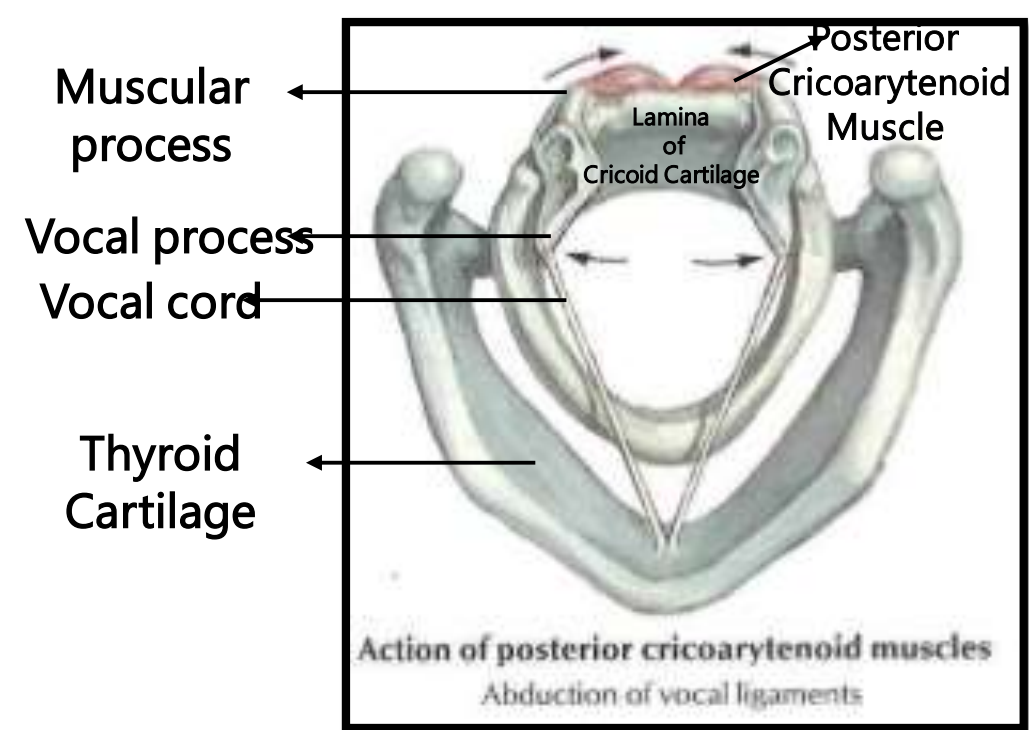
- Posterior surface of muscular process of arytenoid cartilage

Action-

- Abduction of vocal cords.
- Medial rotation of muscular process of arytenoid cartilage
- Lateral rotation of vocal process of arytenoid cartilage

Nerve Supply-

- Recurrent Laryngeal Nerve



**Thank
You**

