



Anatomy Of The Larynx

By

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Anatomy

Developmental

I-II

Start at the 4th

Supraglottic larynx

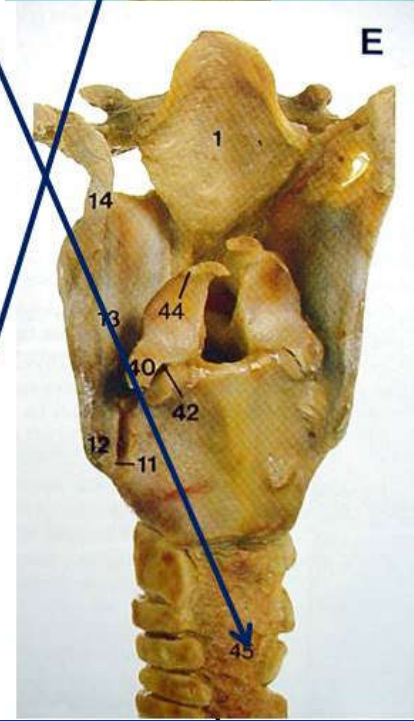
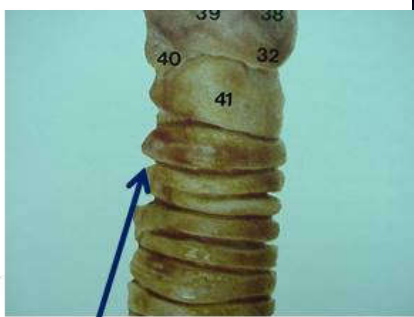
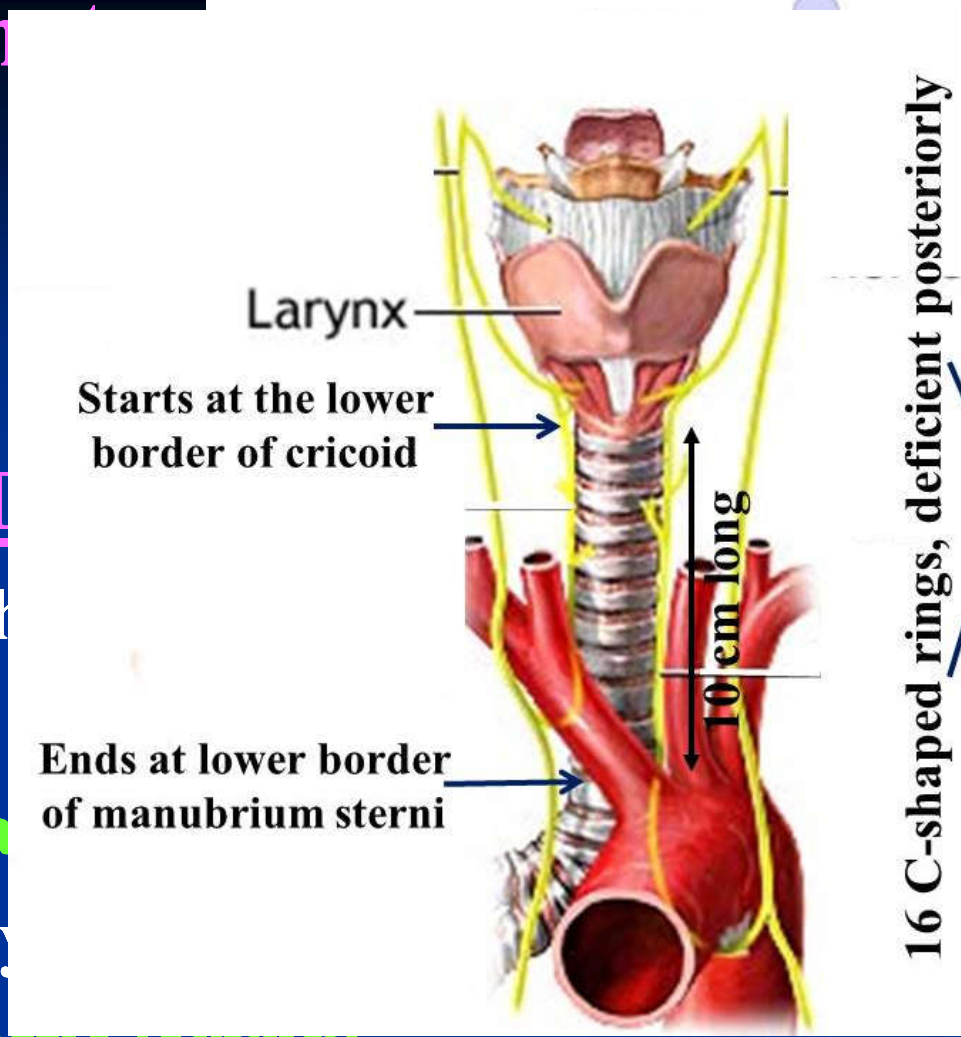
.Arises from hyoid

Glottic, subglottic larynx:

.Arise from laryngotracheal groove and arch VI.

Tracheo-esophageal septum:

.Separates the trachea from the esophagus.



16 C-shaped rings, deficient posteriorly

II-Descriptive anatomy:

(1) General description:

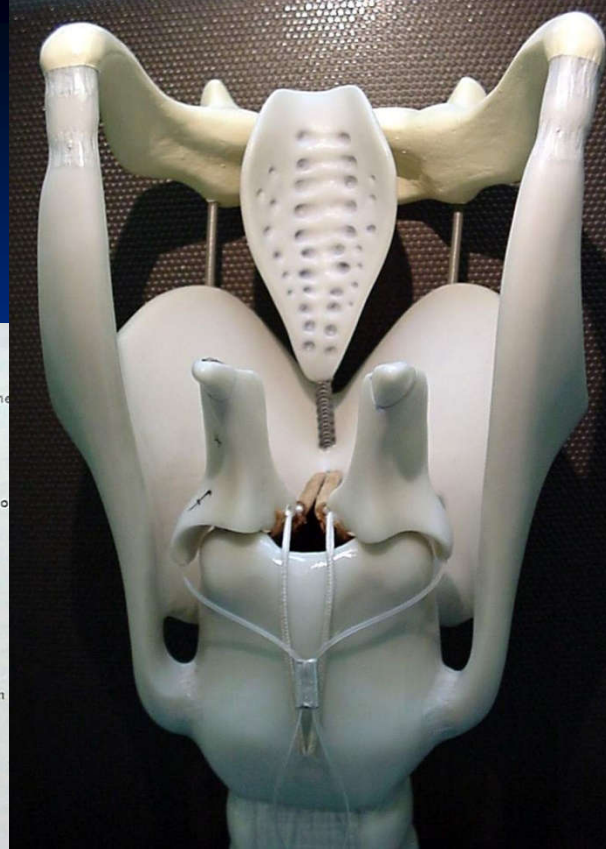
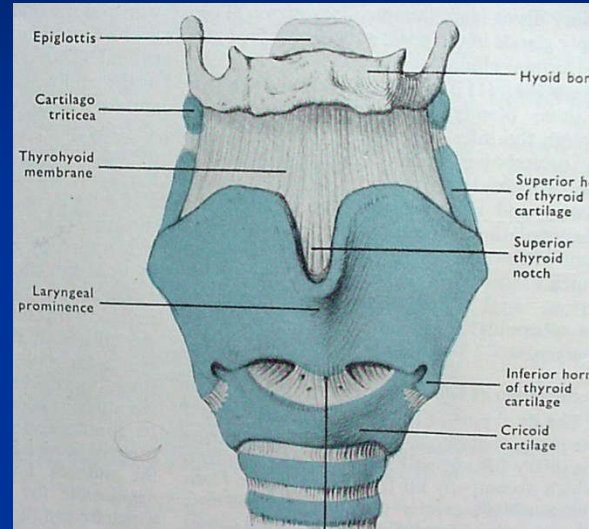
- **Organ of voice {×}** → (Or)
- **Site:** midline of neck, above t
- **Protection of Lx:**
 - **Externally:**
 - Anteriorly
 - Post
 - Elasticity of cartilages
 - Relative mobility
 - **Internally:**
 - Reflex closure
 - Ref
- **Differences between child**
 - **Size:** Relatively smaller
 - **Site:** Higher
 - **Shape:** Long, tubular epiglottis, larger aryepiglottic folds. →
 - **Structure:** .Softer .MM loosely attached to subglottic Lx



(2) Framework of larynx:

■ The larynx consists of:

- Number of cartilages
- Articulate in joints
- Connected by:
membranes, ligaments
- Moved by muscles



❖ A- Cartilages:

Single

Thyroid

Cricoid

Epiglottis

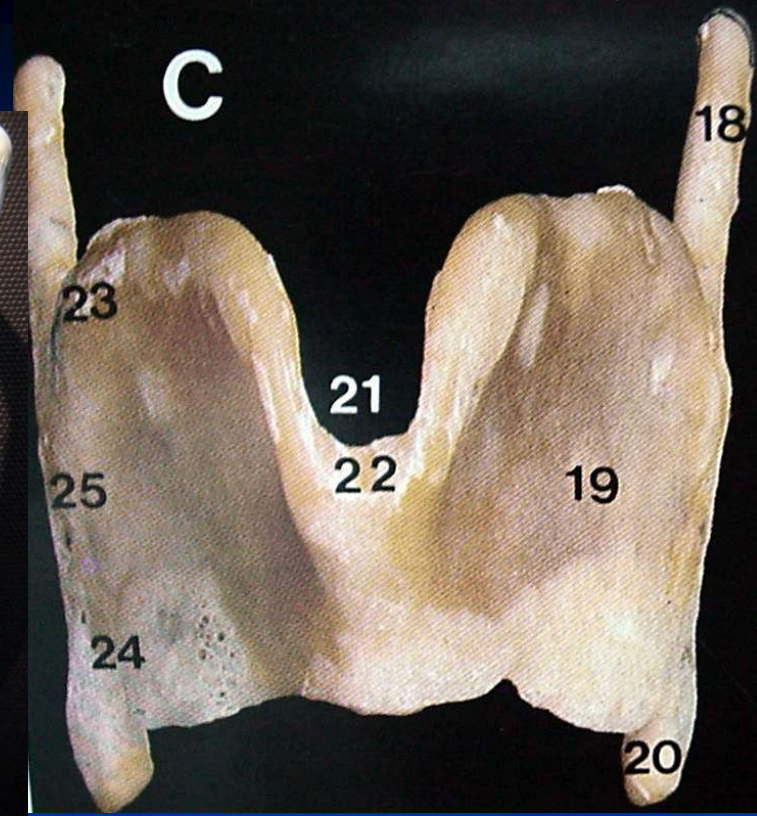
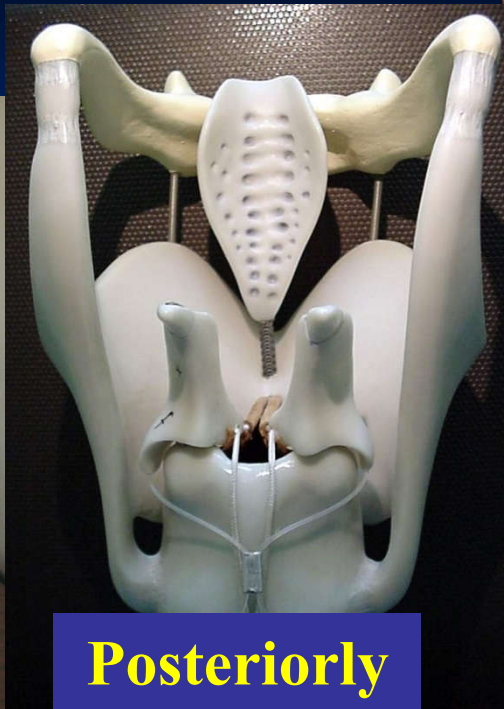
Paired

Arytenoid

Corniculate

Cuneiform

■ 1- Thyroid cartilage:



■ 2 laminae (alae)(19):

*Fused anteriorly:

~Forming thyroid angle (22): acute in males, obtuse in females.

~The fusion is incomplete superiorly forming thyroid notch (21)

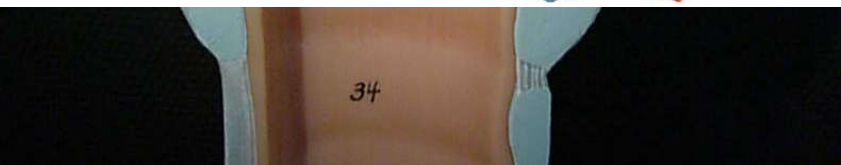
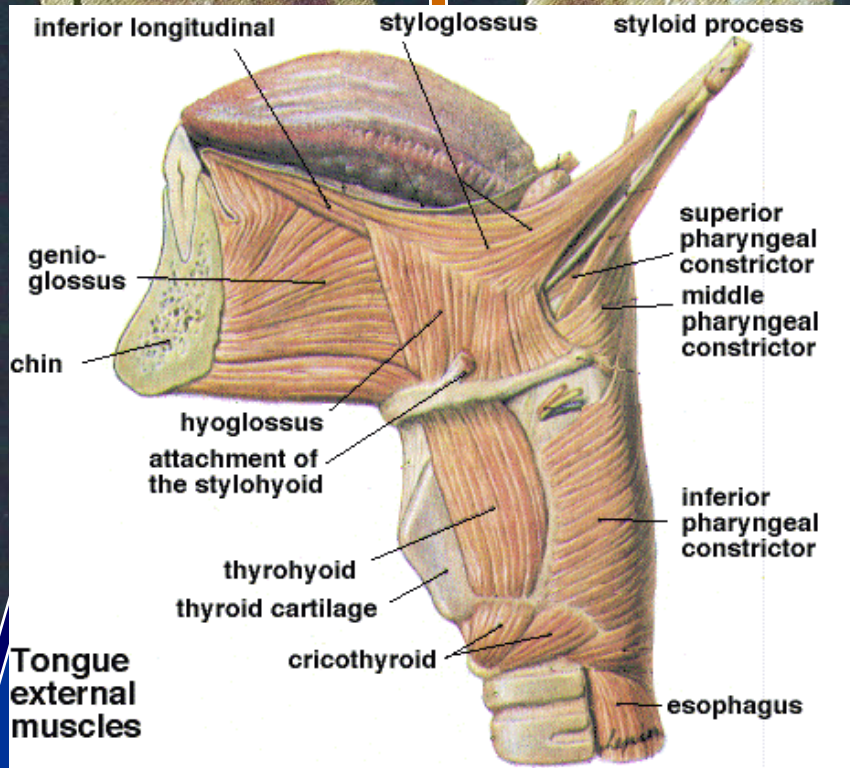
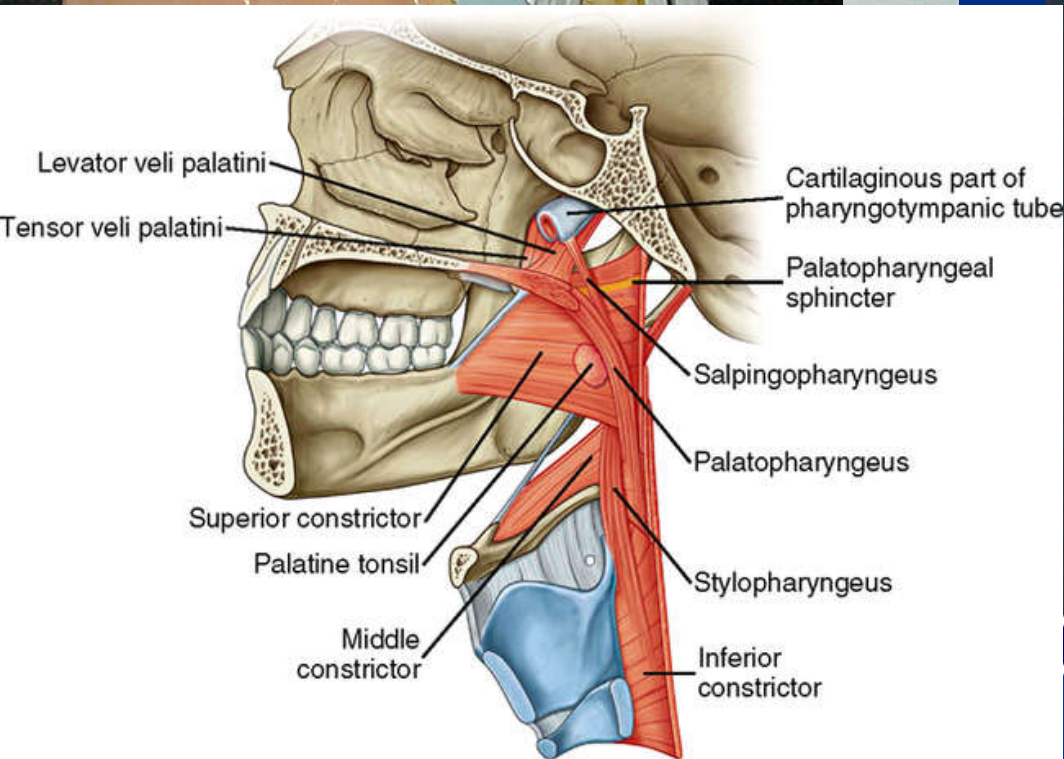
*Deficient posteriorly: like an open book

*Superior, inf. horns (18,20): projecting from the ala posteriorly.

*Oblique line: on lateral surface, site of muscle attachment (25)

■ **Attachment: 1-Sup, inf borders**

3-Inner aspect

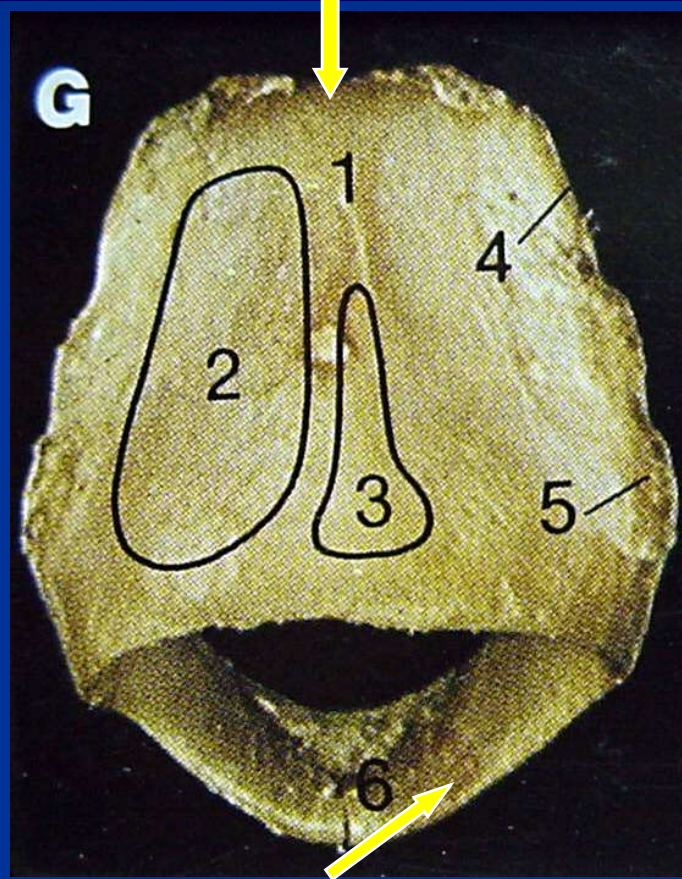


2-Posterior border:
Longitudinal muscles of pharynx

■ **2- Cricoid cartilage:**

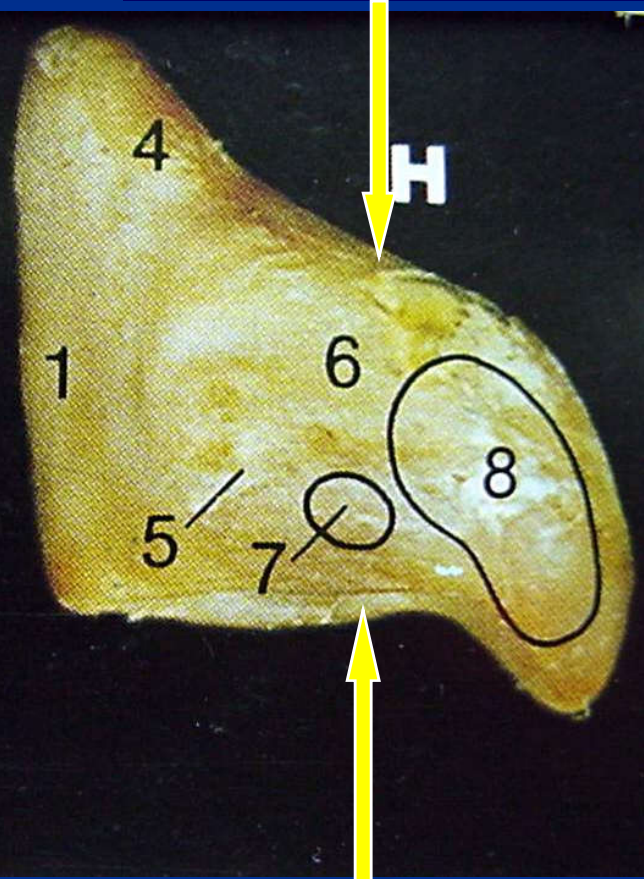
- **Only complete** cartilaginous ring in the airway
- **Signet ring with:**

Broad posterior lamina



Narrow anterior arch

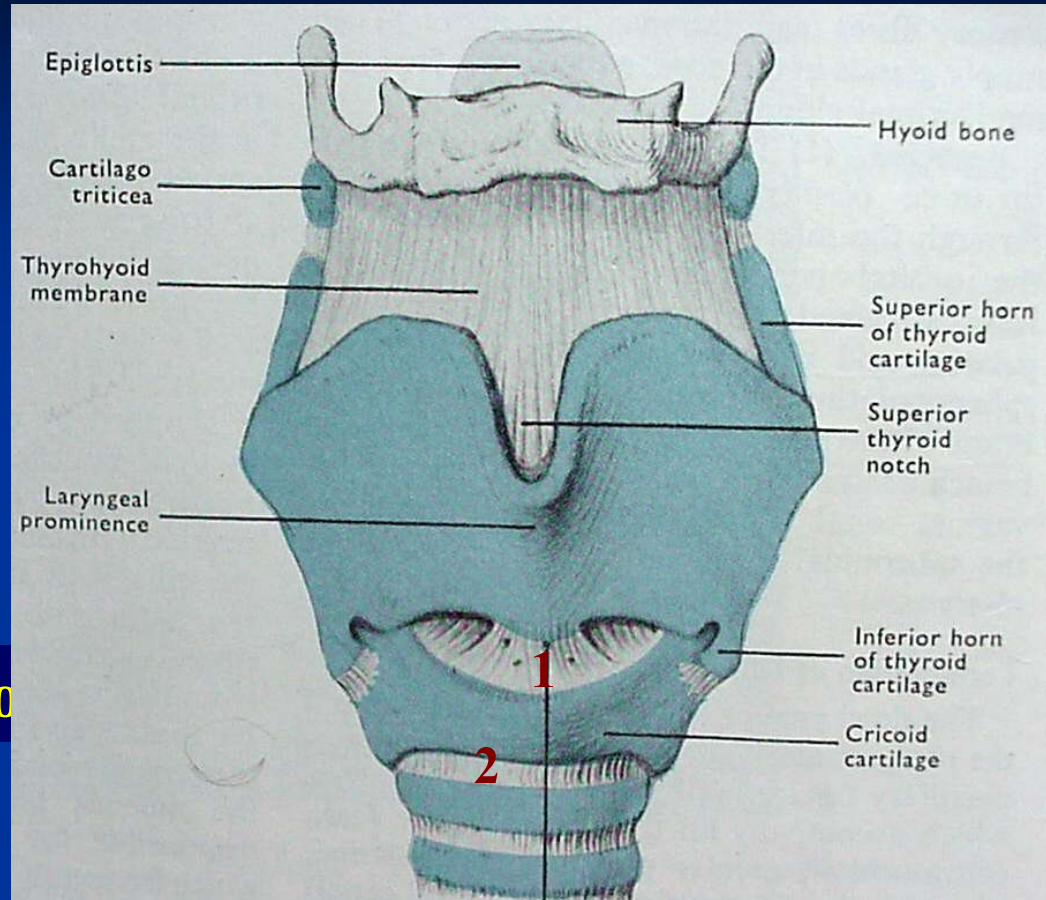
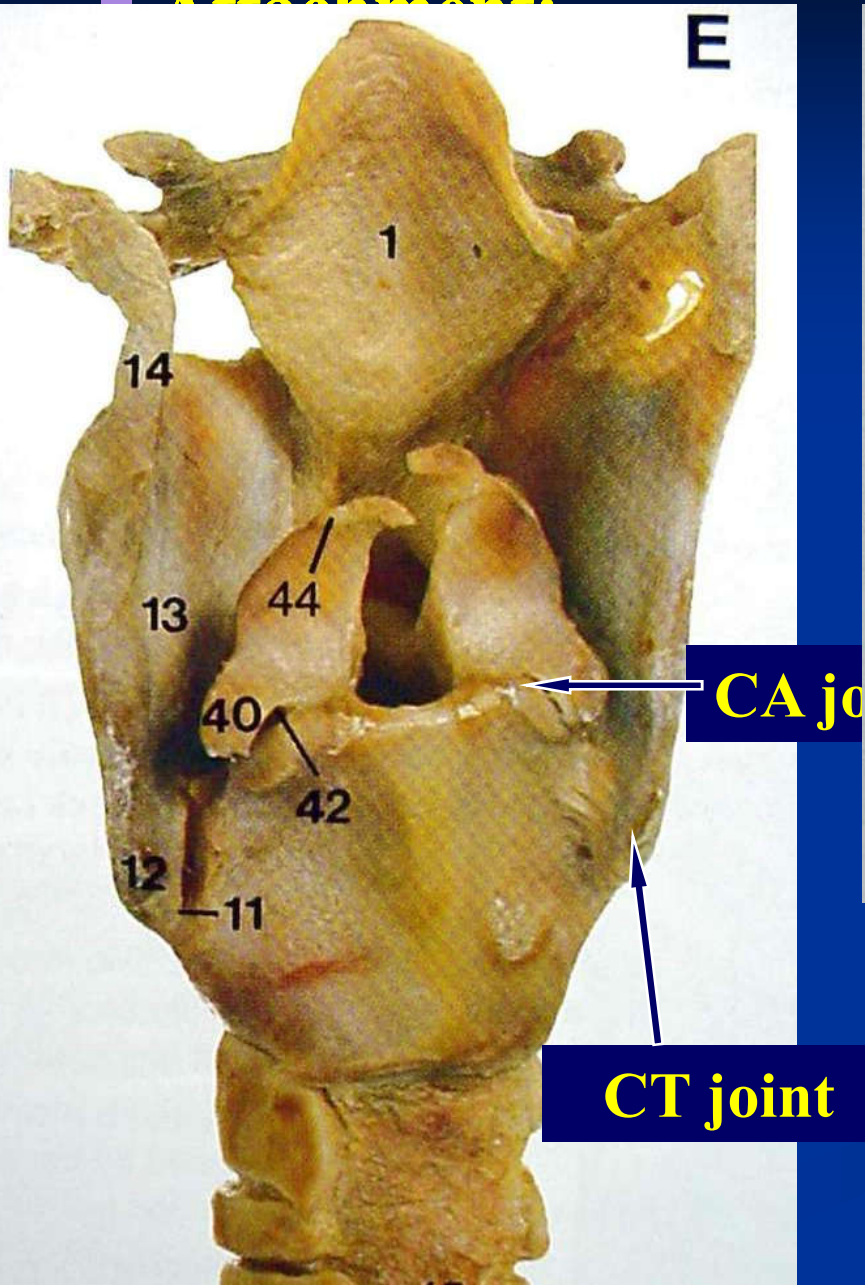
Slopping sup. margin



Horizontal inf. margin

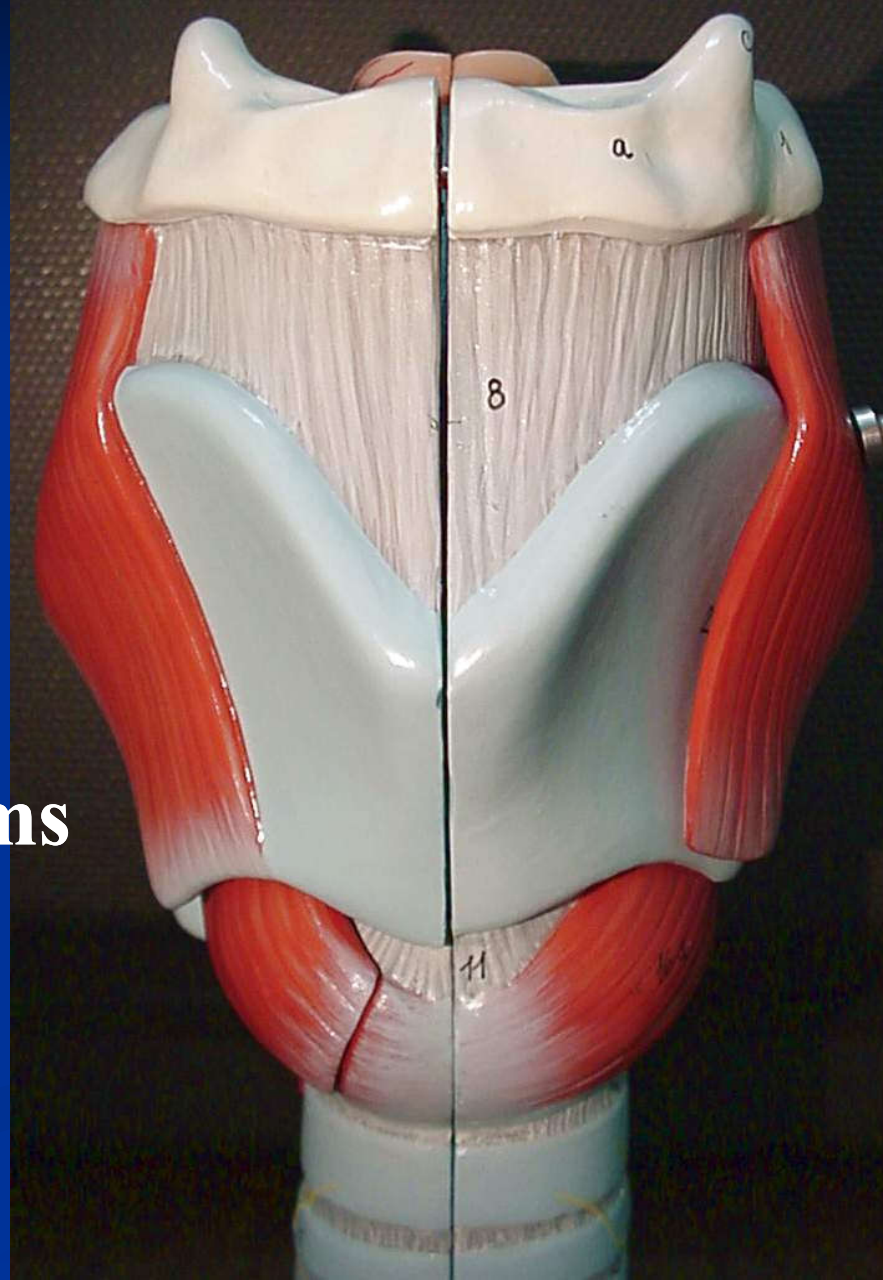
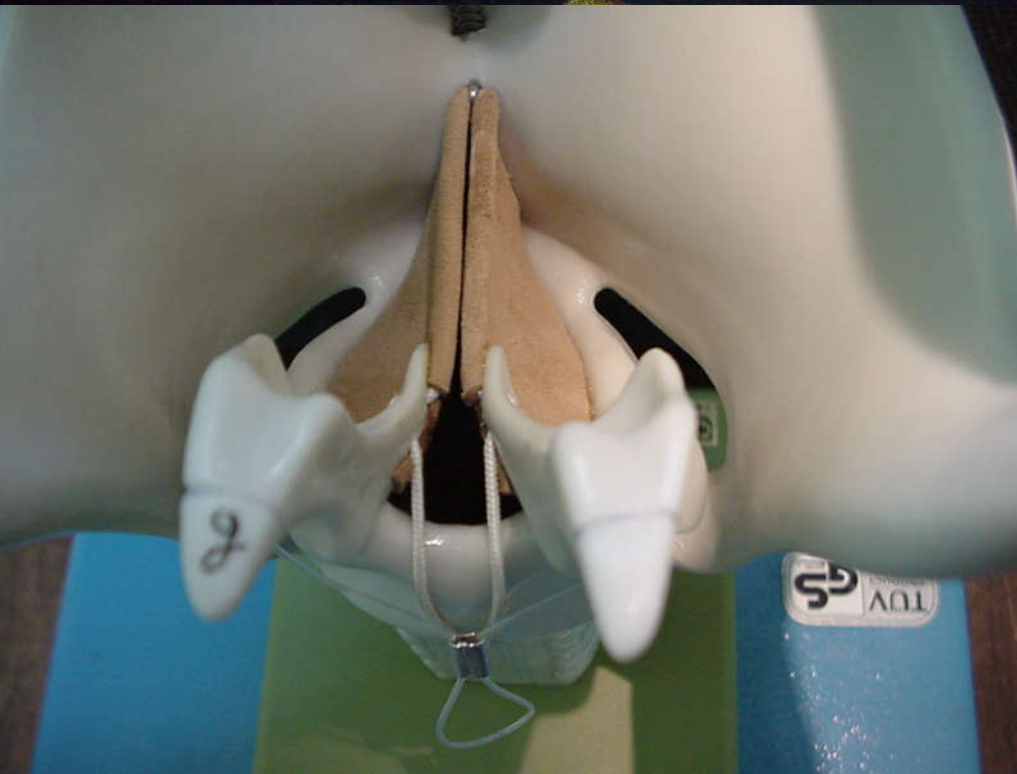
■ Articulations:

■ Attachments:



- * (1) Cricothyroid ligament
- * (2) Cricotracheal ligament

■ **Muscle attachment:**



2-Posterior cricoarytenoid ms

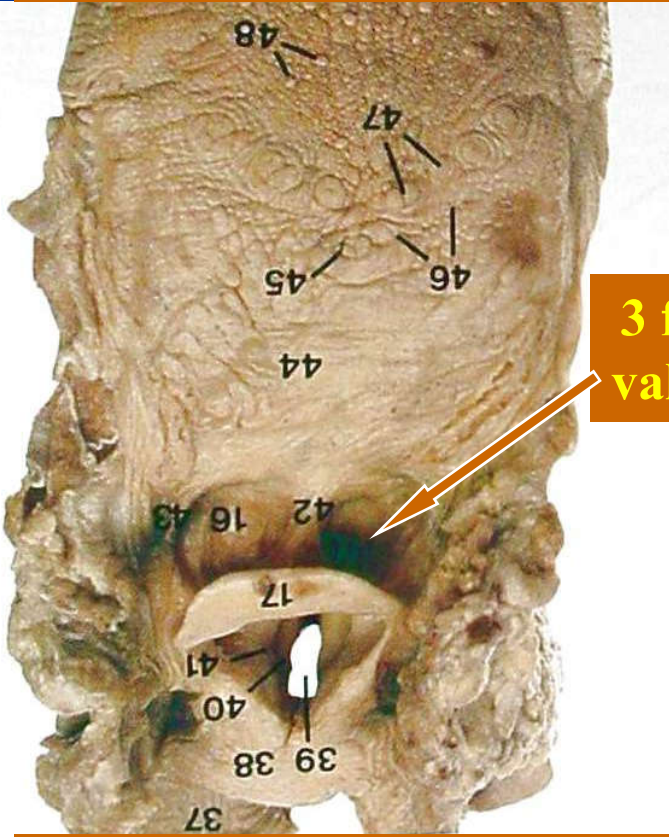
**9-Lateral cricoarytenoid
muscle**

8-Cricothyroid ms

■ 3- Epiglottis:

- Leaf like elastic fibrocartilage projecting up behind the hyoid bone and tongue, with pits on the surface.
- It has:

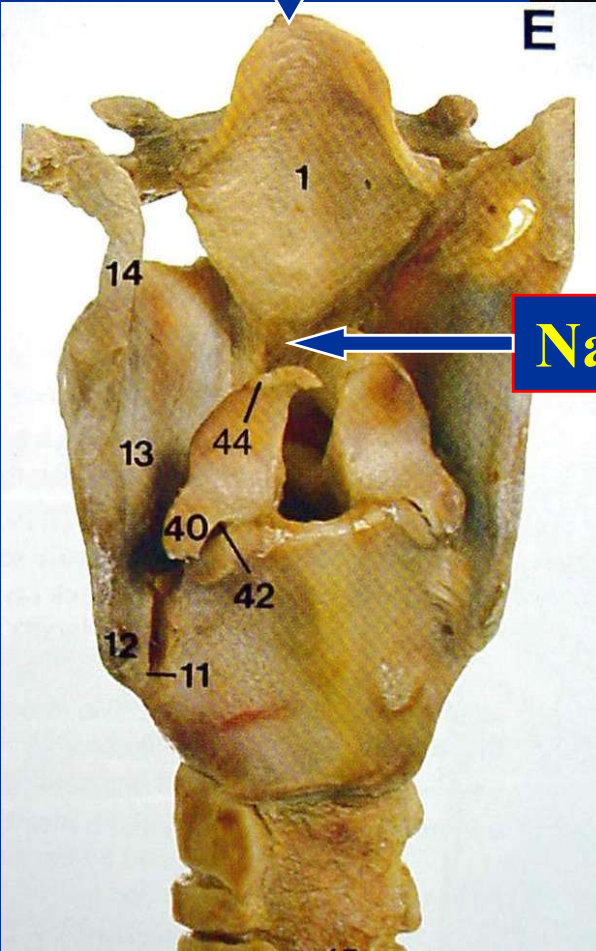
Lingual (ant.) surface



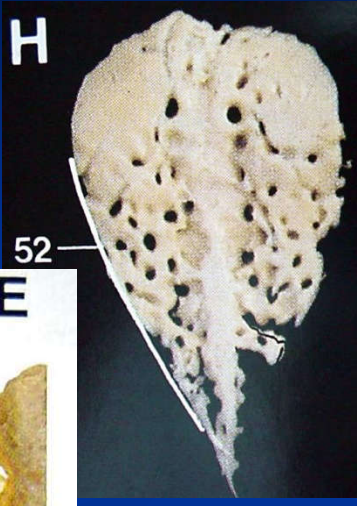
3 folds; 2 valleculae

Laryngeal (post.) surface

Broad base



Narrow stem

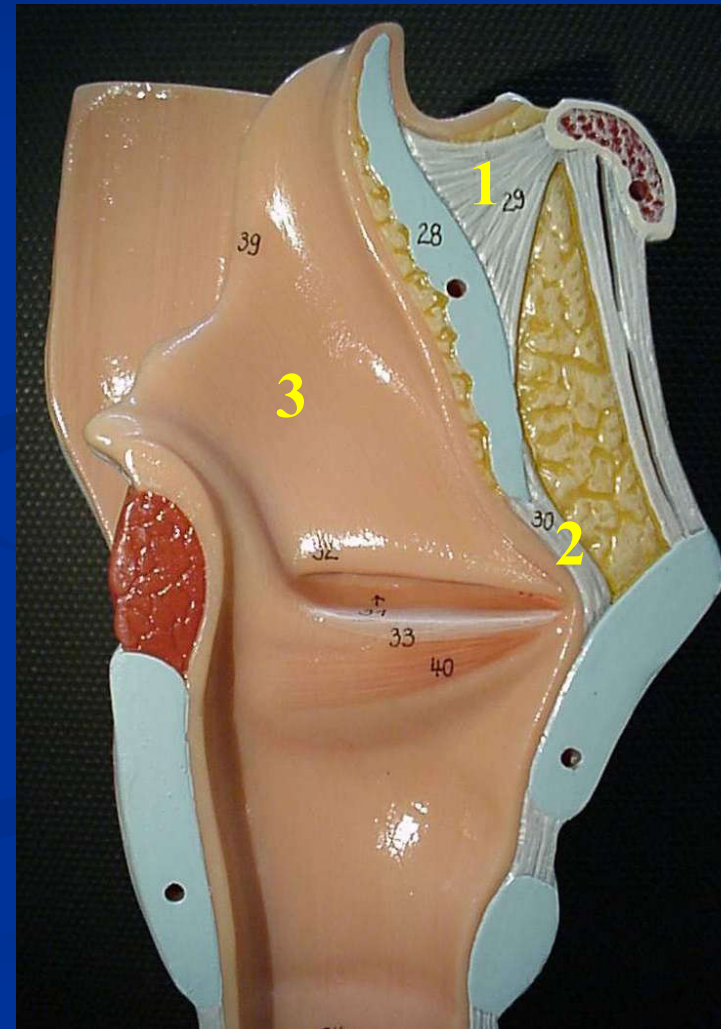
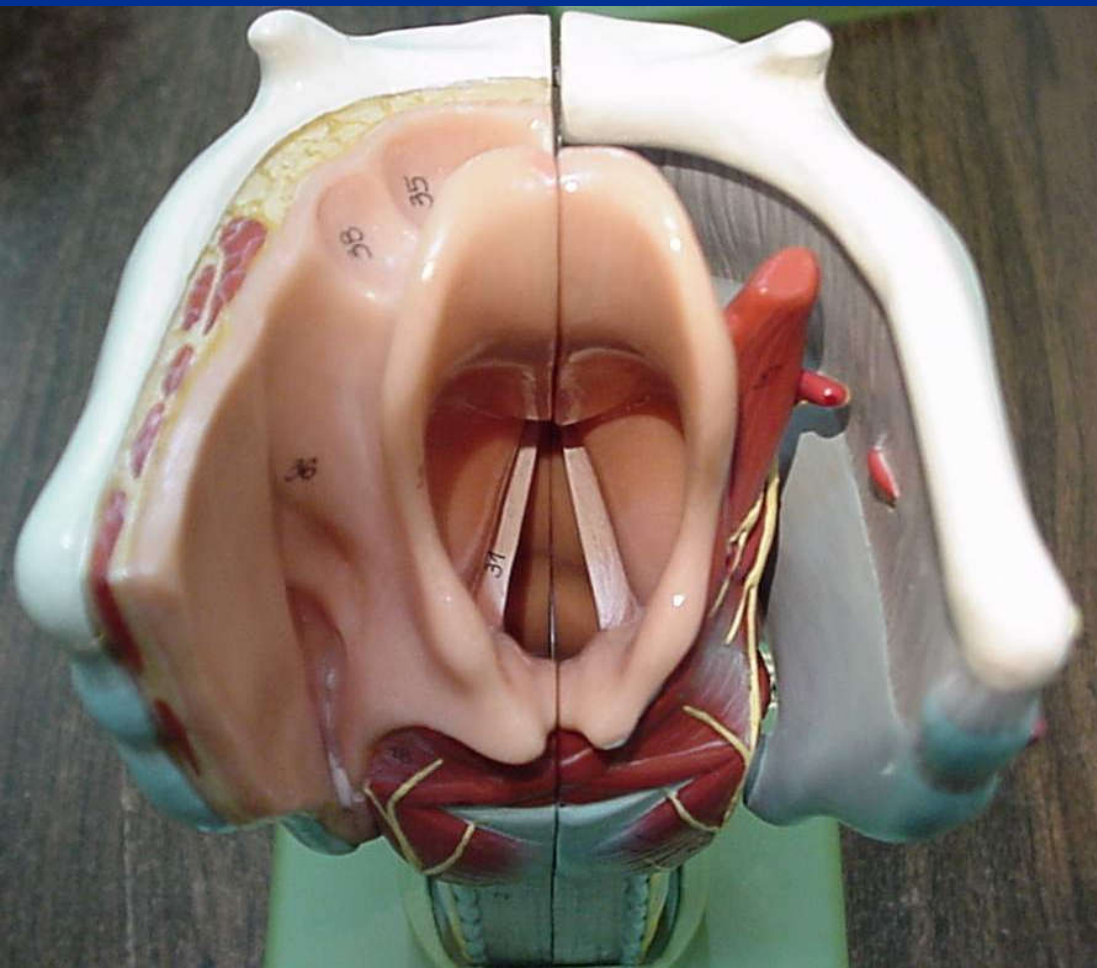


■ Attachment:

1-Hyoid bone: by hyoepiglottic ligament

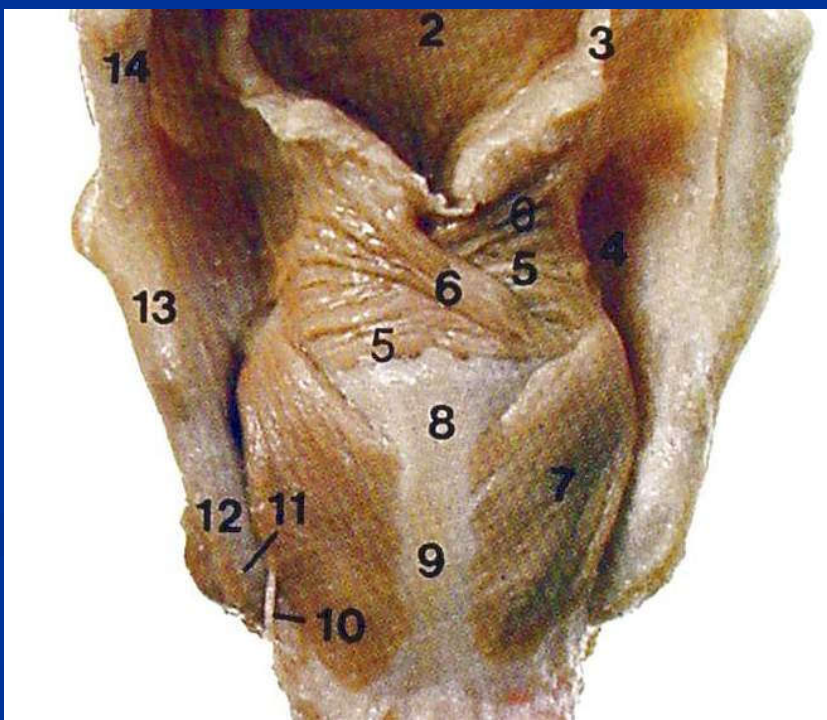
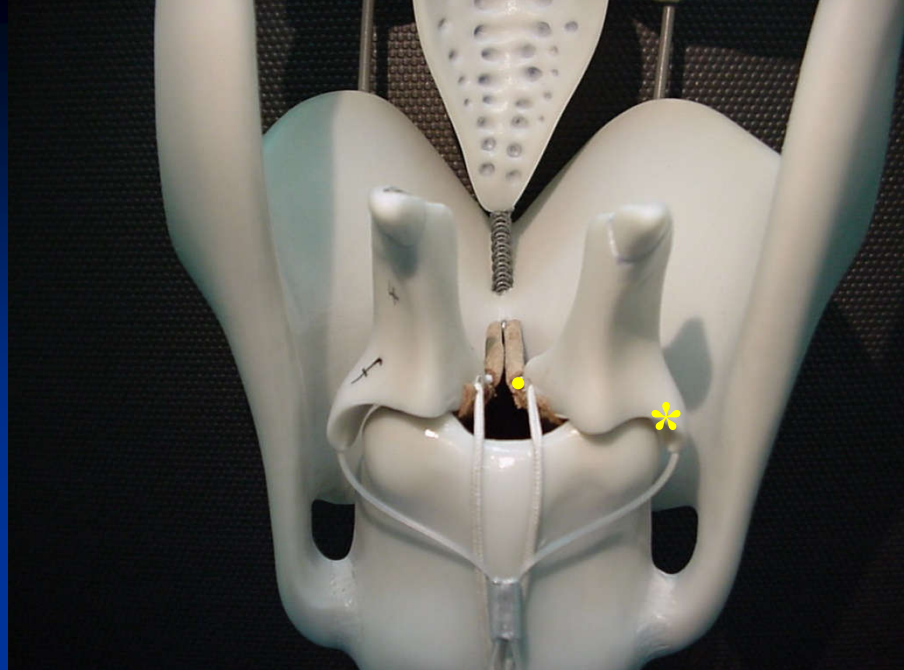
2-Thyroid angle: by thyroepiglottic ligament

3-Arytenoid: by quadrangular membrane



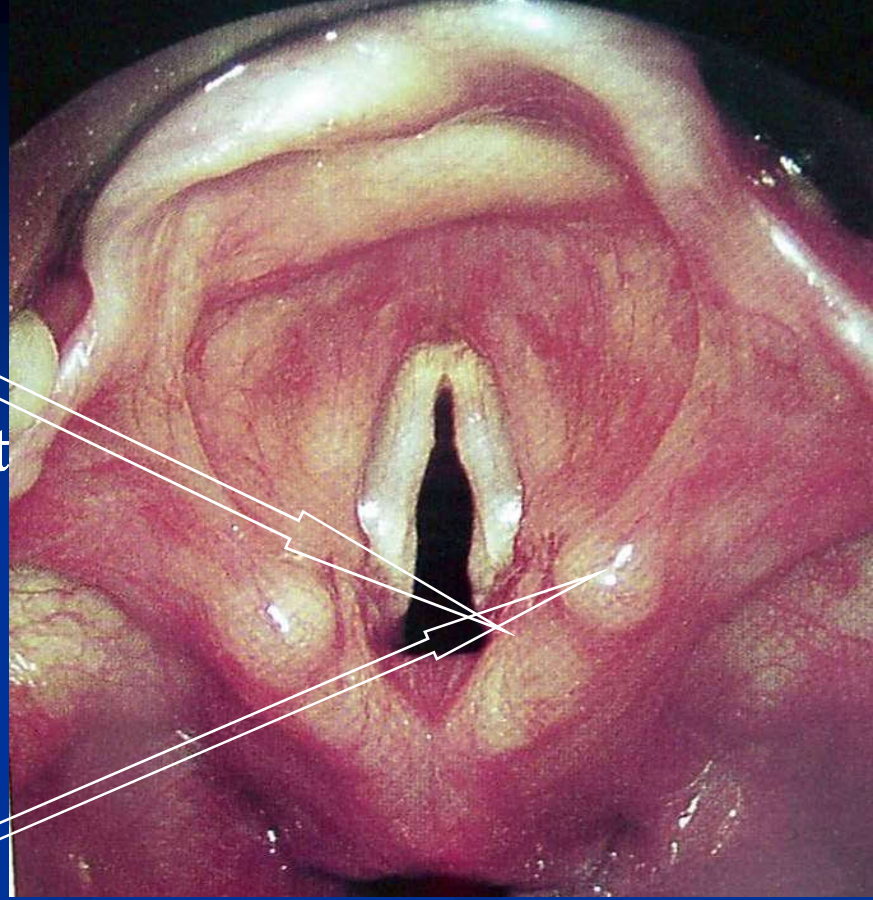
■ Arytenoid cartilage:

- **Largest** of paired ones, pyramidal in shape.
- **Site:** upper border of cricoid
- **It has:**
 - 1-**Apex:** articulates with corniculate.
 - 2-**Base**
 - 3- **3 surfaces:**
 - A-Posterior
 - B- medial
 - C-Anterolateral
 - 4- **2 processes:**
 - * Muscular: lateral
 - * Vocal: anterior
- **Articulations:**
 - * Cricoid
 - * Corniculate
- **Attachment:**
 - * Vocal ligament
 - * Quadrangular M.
 - * Muscles



- **Corniculate cartilage:**

- Small elastic fibro-cartilage
- In the posterior part of aryepiglottic fold
- Articulates with apex of arytenoid



- **Cuneiform:**

- Small elastic fibro-cartilage in the aryepiglottic fold, anterior to corniculate.

- **Both provide stiffness and elastic recoil to aryepiglottic fold**

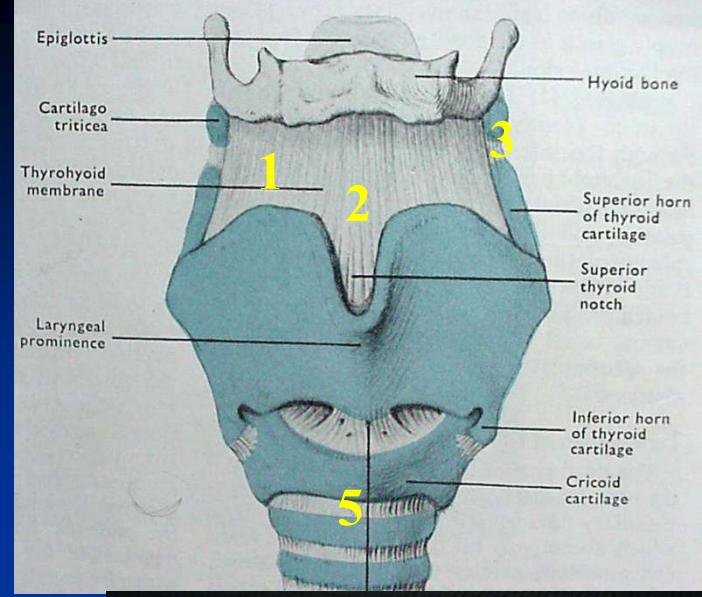
❖ B- Ligaments and membranes:

■ 1- Extrinsic ligaments:

- **Connect** laryngeal cartilages to skeletal structures outside the larynx.

- **Include:**

- 1-Thyrohyoid membrane
- 2-Median thyrohyoid ligament
- 3-Lateral thyrohyoid ligament
- 4-Hyoepiglottic ligament
- 5-Cricotracheal ligament



■ 2- Intrinsic ligaments (fibroelastic membrane):

■ Divided into 2 by ventricle:

1-Upper quadrangular membr:

~From lateral border of epiglottis to corniculate and arytenoid cartilages.

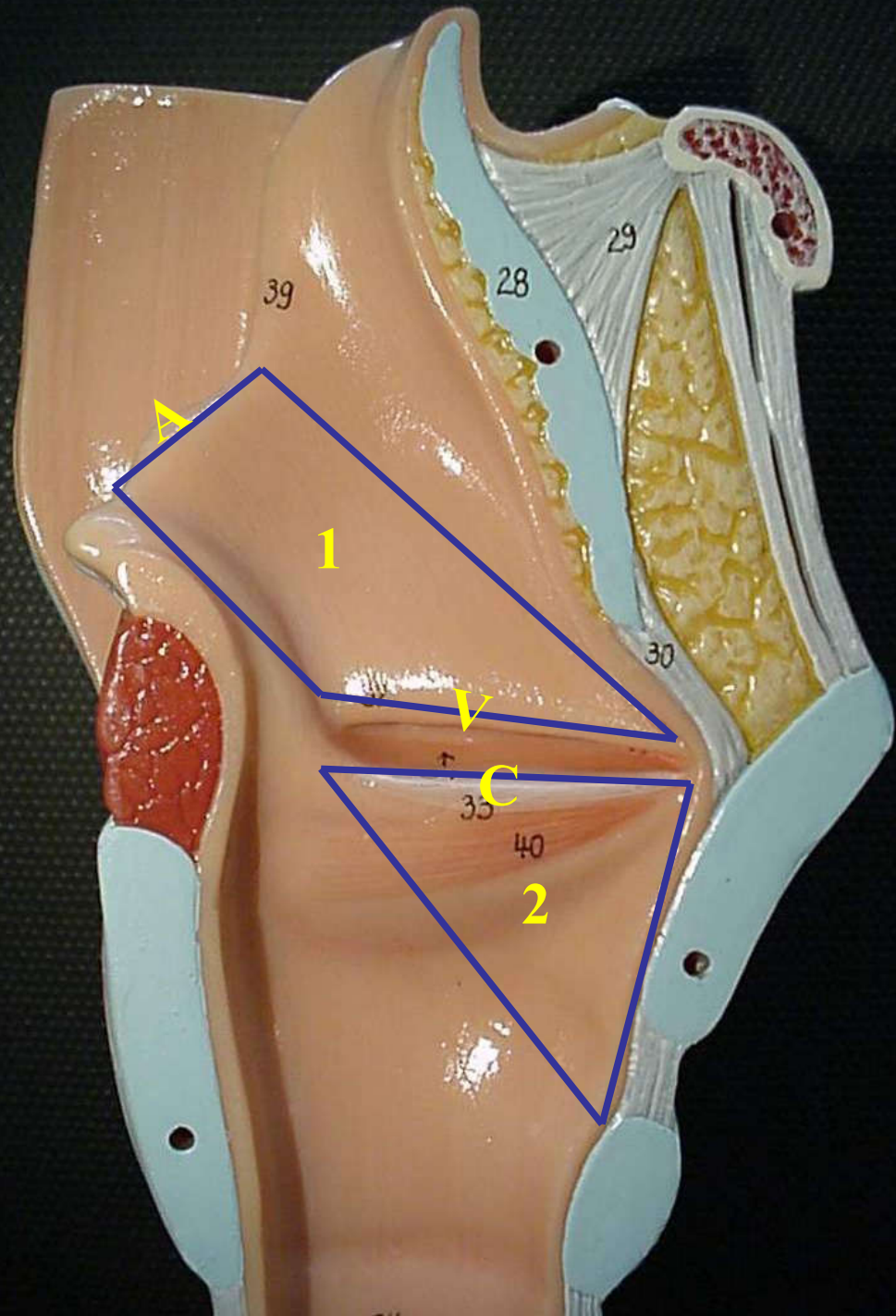
~Free upper border form aryepiglottic fold (A)

~Free lower border form vestibular lig. and fold (V)

2-lower triangular membrane: (conus elasticus)

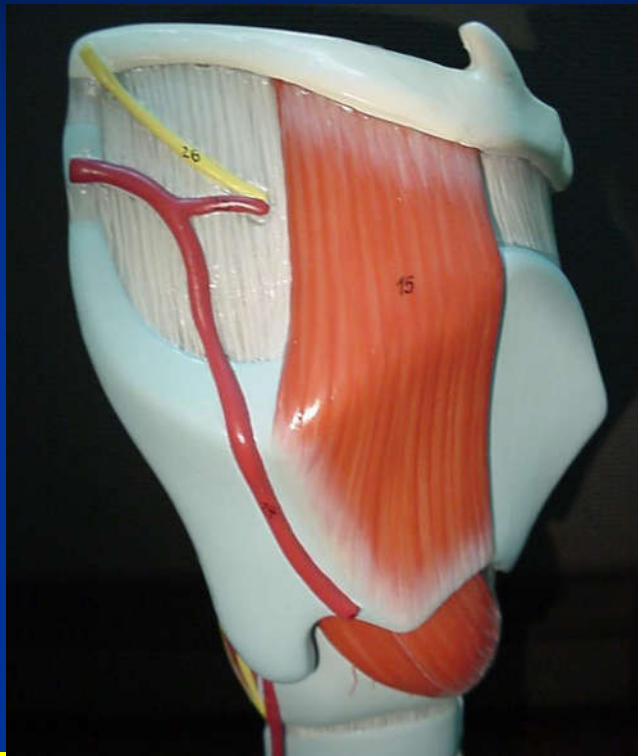
~From thyroid angle and upper border of cricoid to vocal process of arytenoid.

~Free upper border forms the vocal ligament and fold (C).



❖ C- Joints Of The Larynx → Synovial

1- Cricothyroid

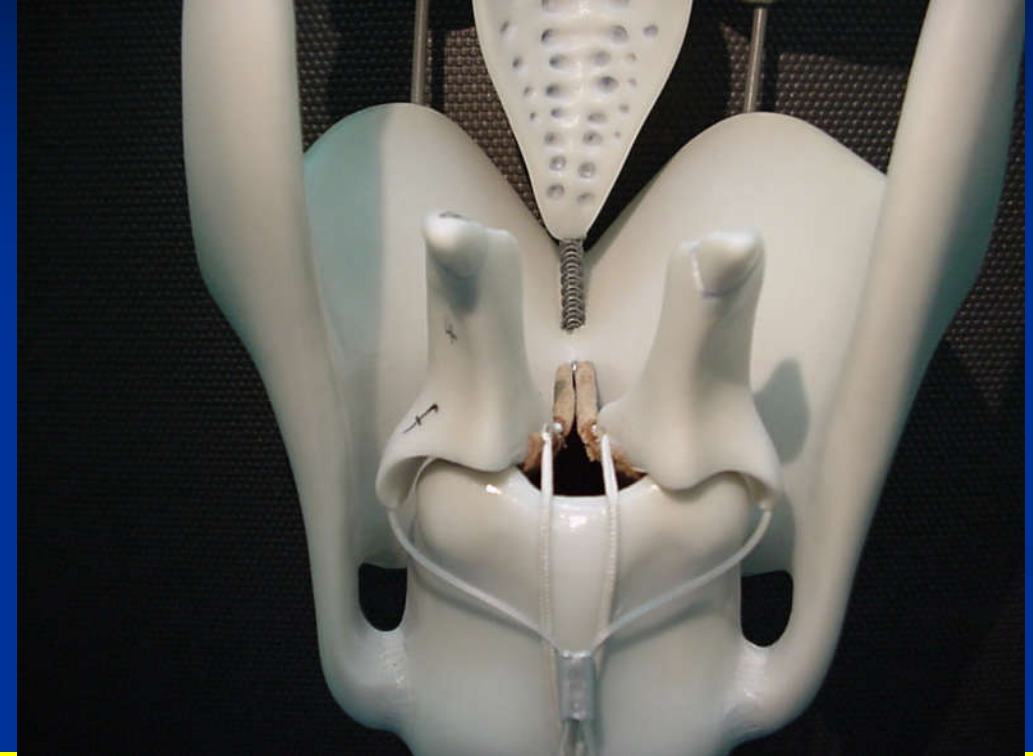


-Articulation: inferior cornu of thyroid and facet at junction of arch, lamina of cricoid.

-Movement: down and forward rotation of thyroid on cricoid.

-Muscles: cricothyroid: VF tensor

2- Cricoarytenoid



-Arytenoid cartilage and oval facet on upper border of cricoid lamina.

-Rotation and gliding movement of arytenoid

-Abductors, adductors of VF.

3 Aryt.-corniculate

-Apex of arytenoid and corniculate cartilage.

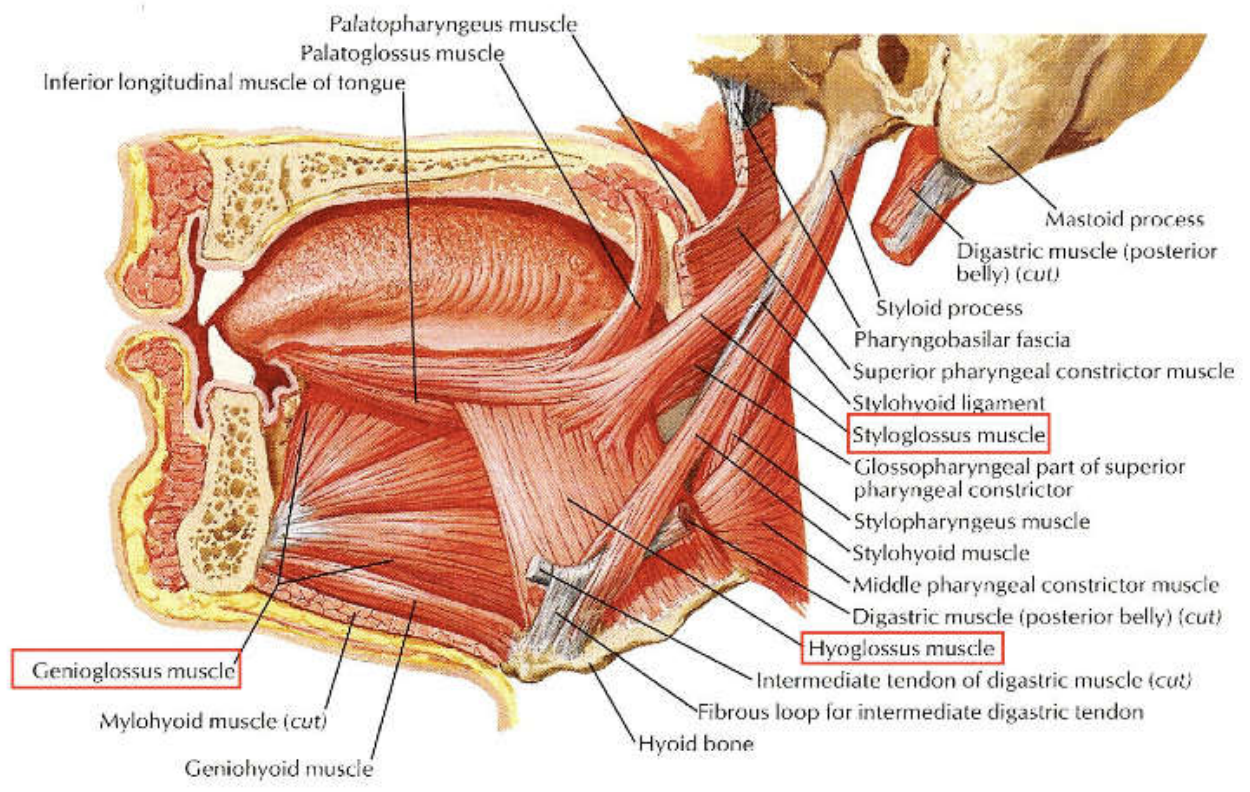
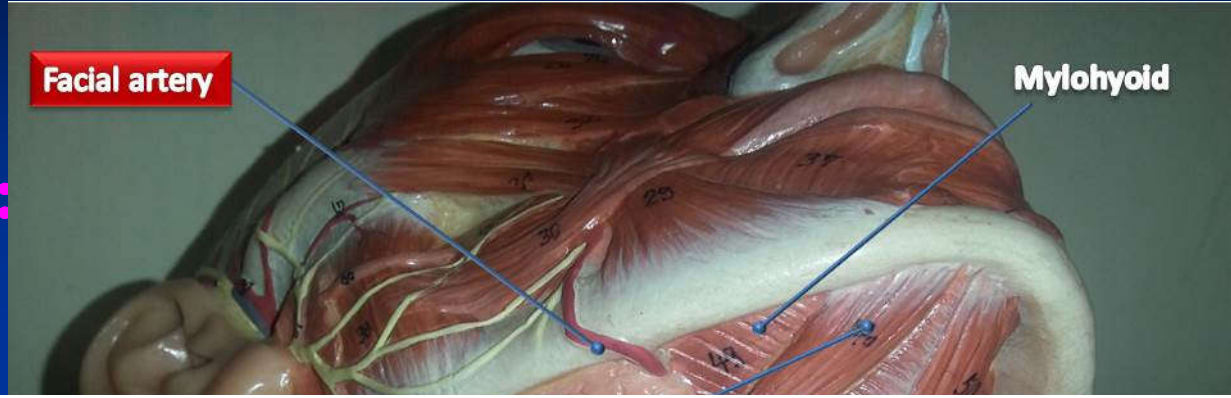
❖ D- Laryngeal muscles

■ Extrinsic muscles:

■ Elevators of Lx:

A- Suprahyoid ms:

- 1-Digastric
- 2-Geniohyoid
- 3-Mylohyoid
- 4-Stylohyoid

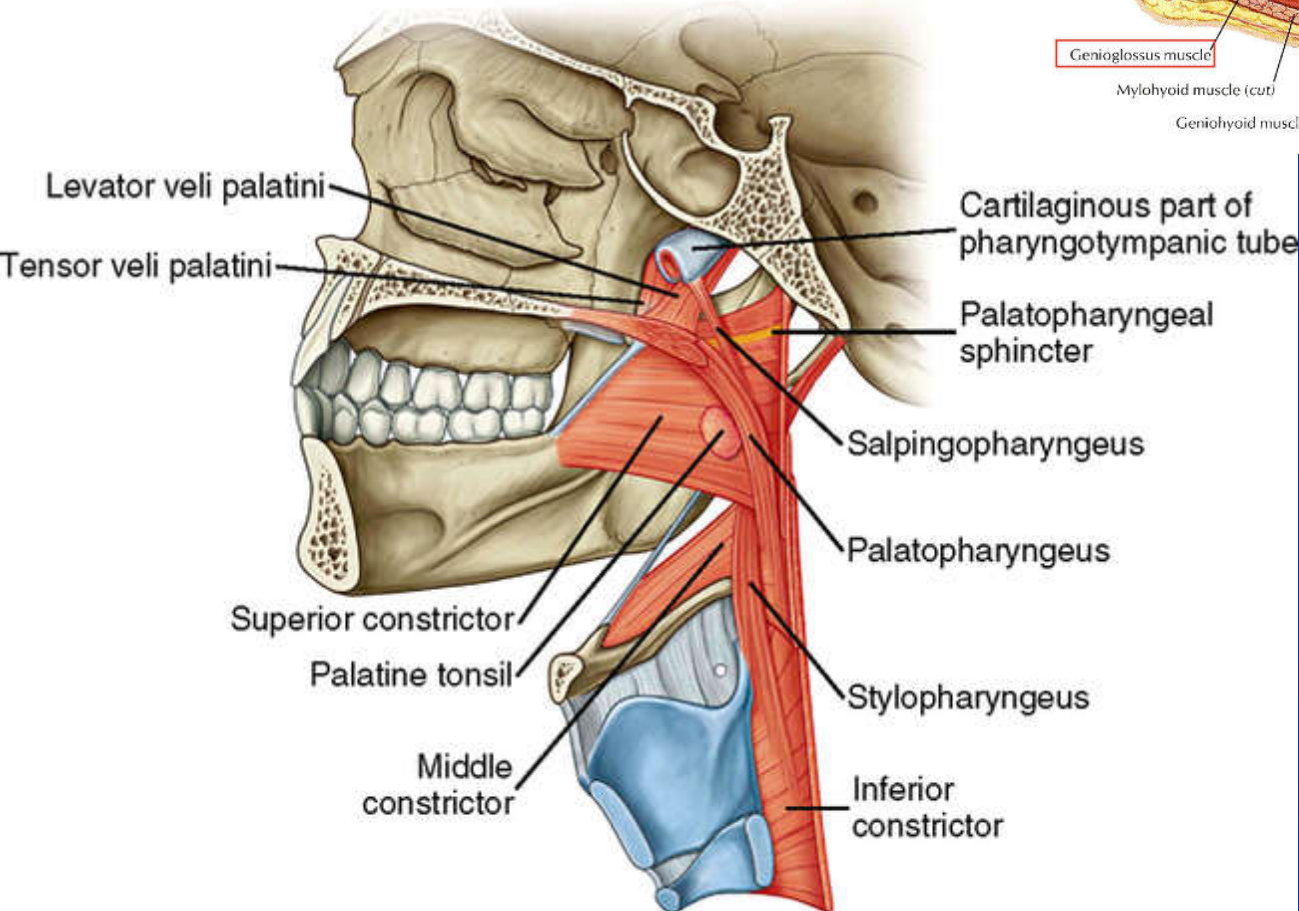
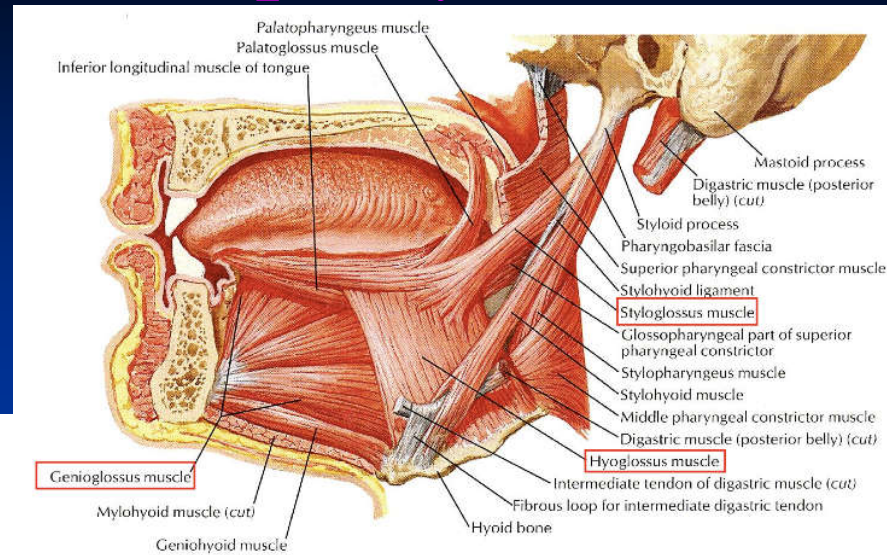


B- Longitudinal muscles of the pharynx:

1-Stylopharyngeus

2- Salpingopharyngeus

3-Palatopharyngeus

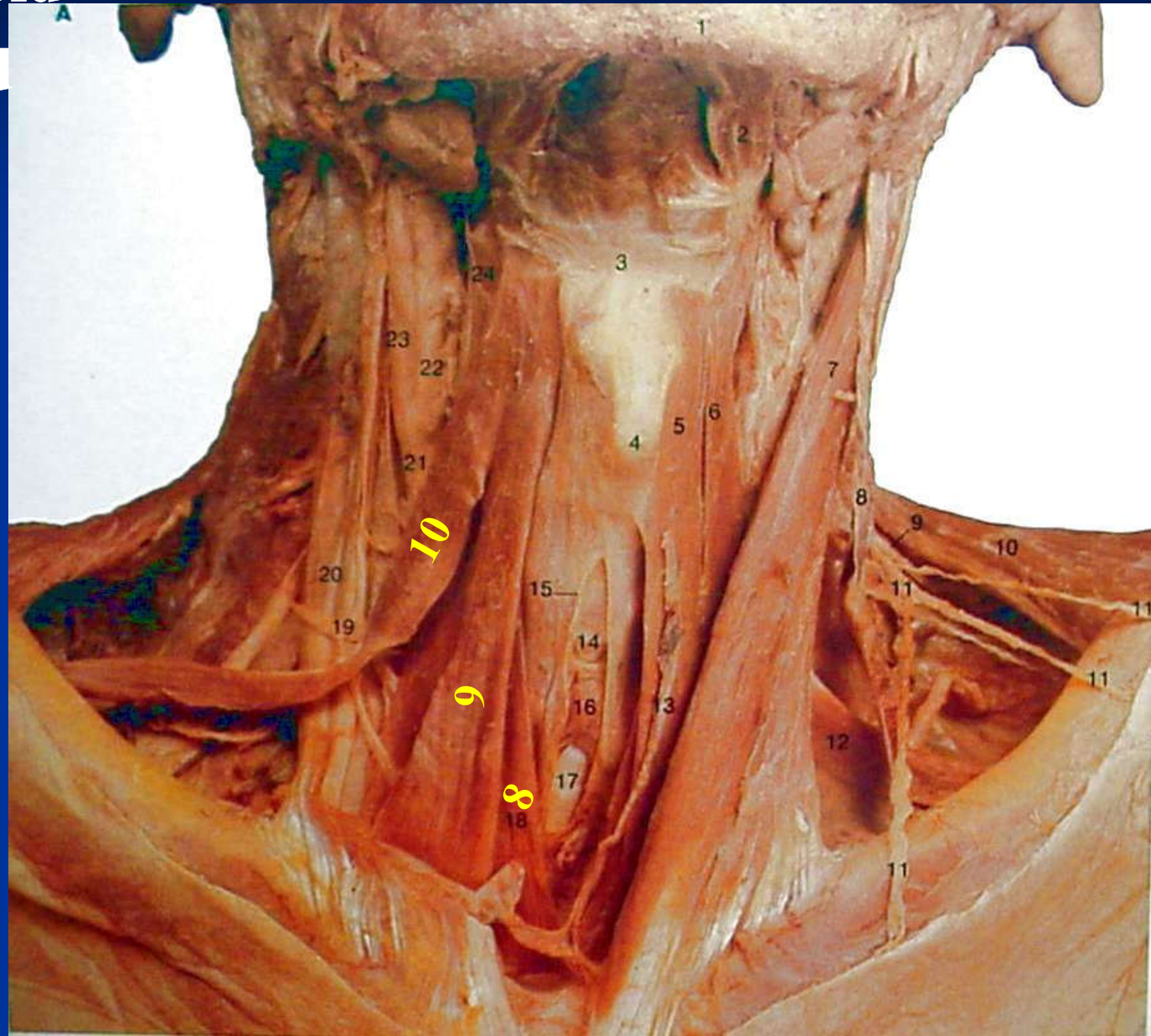


■ Depressors of Lx:

8- Sternothyroid

9- Sternohyoid

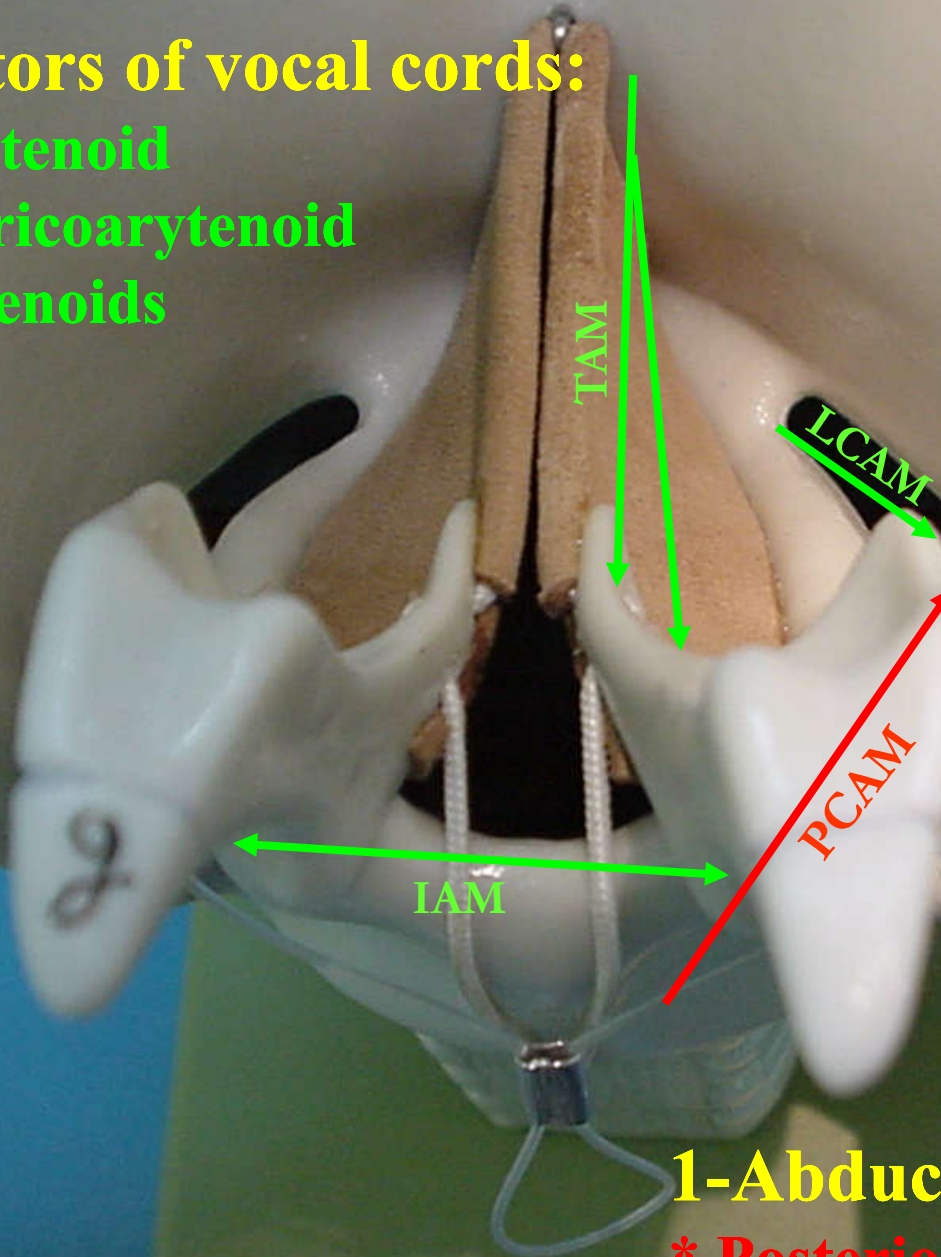
10- Omohyoid



Intrinsic muscles of Lx:

2- Adductors of vocal cords:

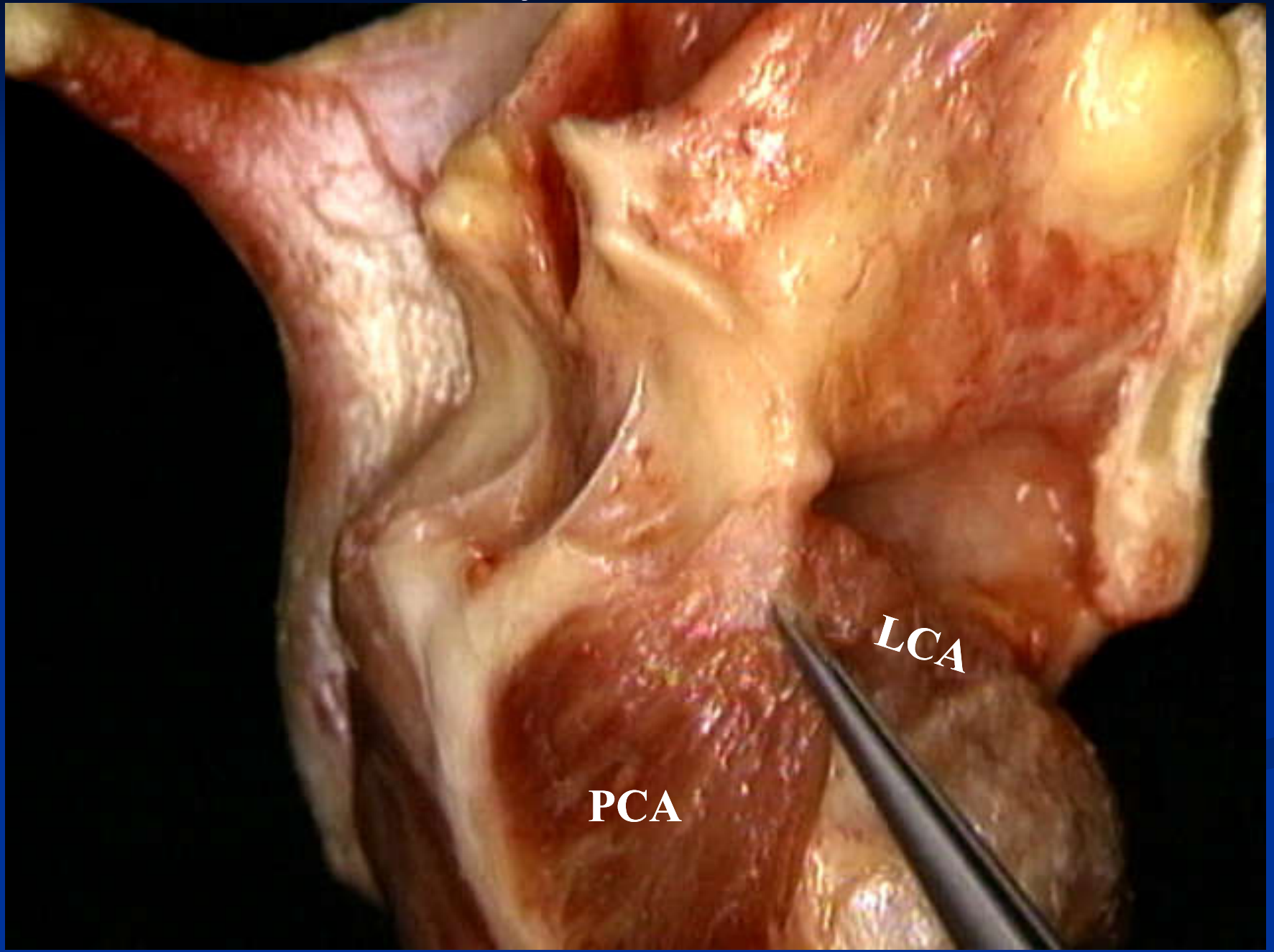
- * Thyroarytenoid
- * Lateral cricoarytenoid
- * Interarytenoids



1- Abductors of vocal cords:

- * Posterior cricoarytenoid

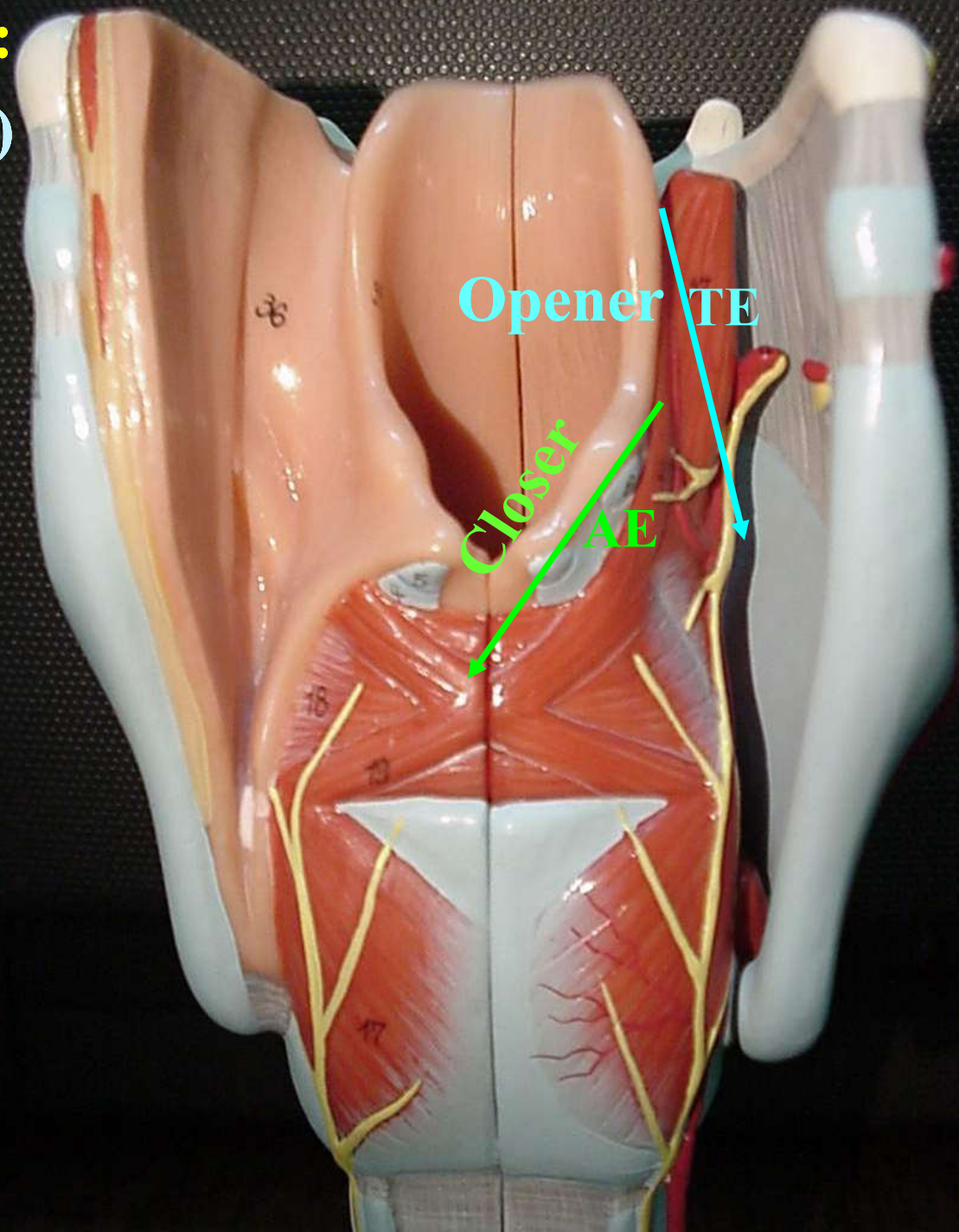
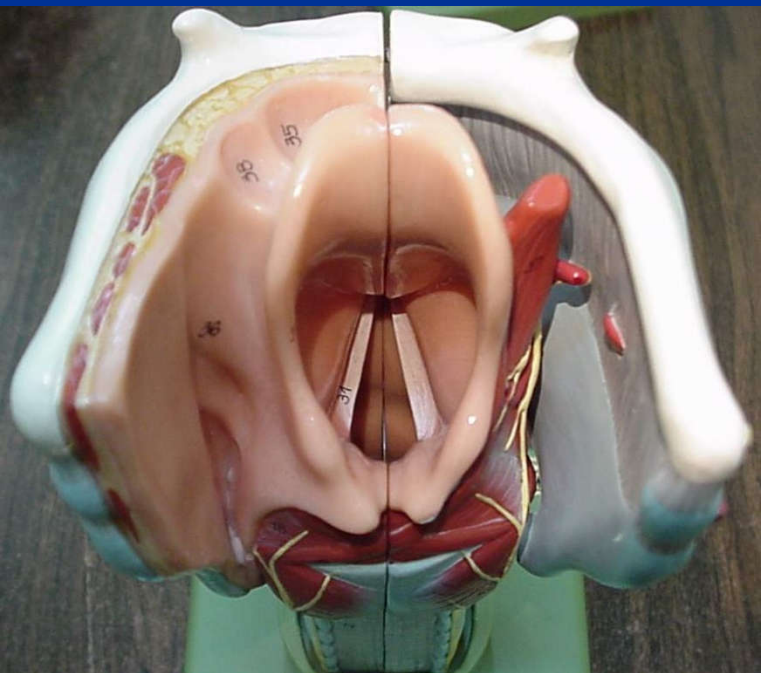
Cricoarytenoid muscles



3- Ms affecting Lx inlet:

* Thyroepiglottic (open)

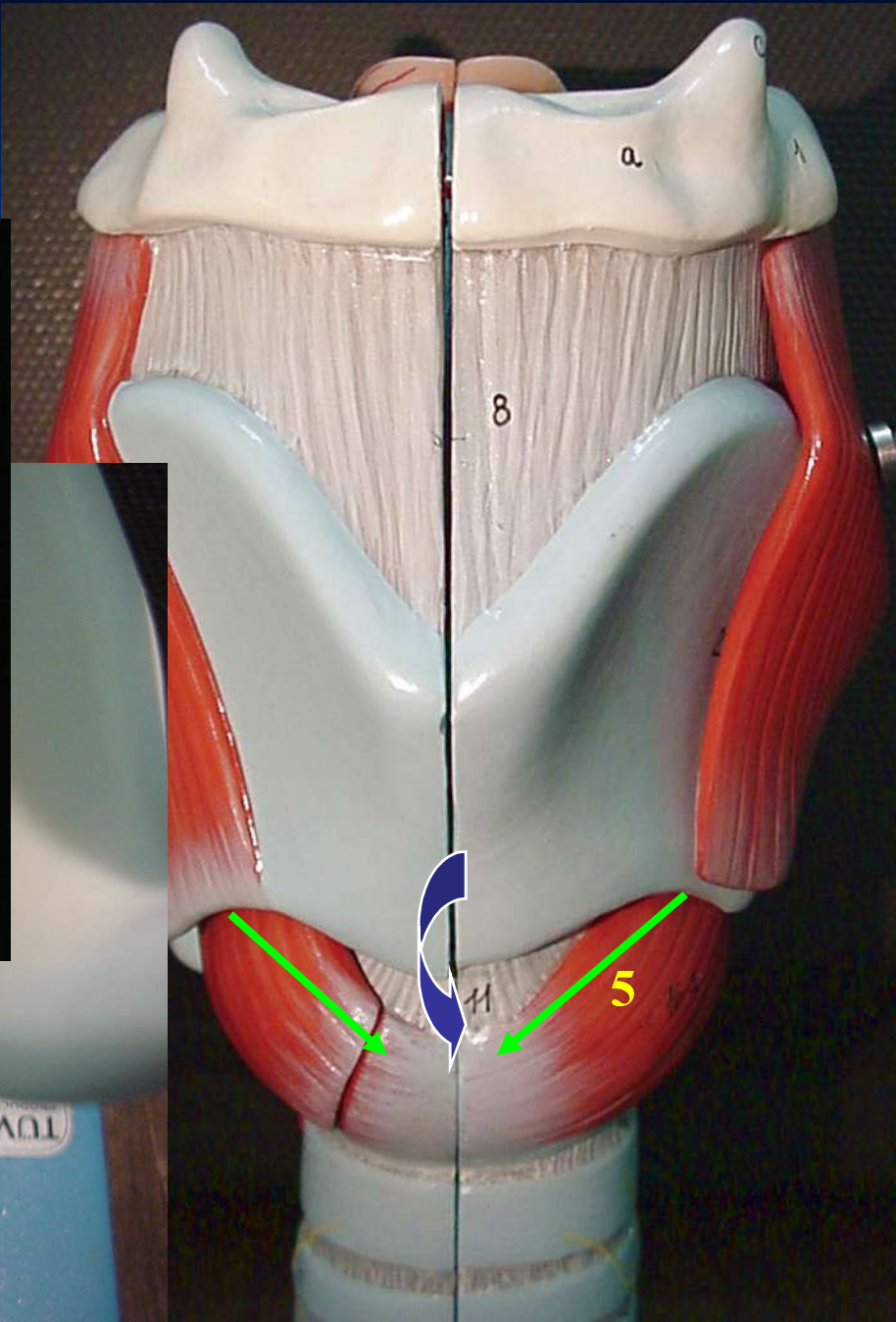
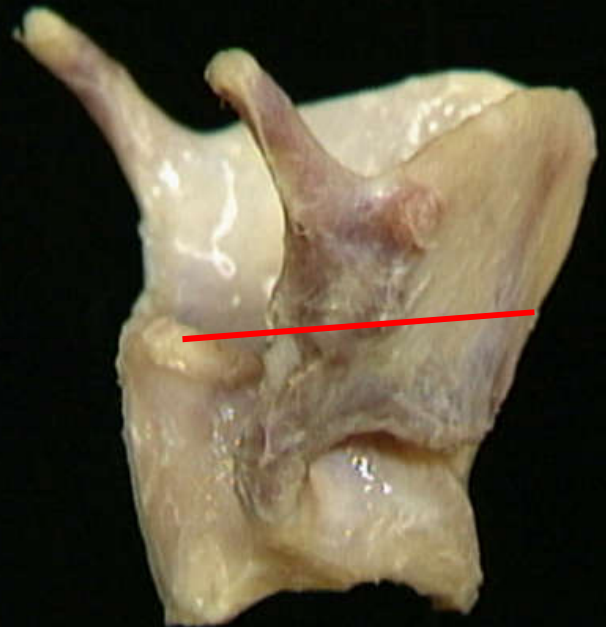
* Aryepiglottic (close)



■ 4- Muscles controlling VF tension:

5-Cricothyroid (increase)

2-Thyroarytenoid (Decrease)



(3) Cavity Of The Larynx:

■ Extension:

*From Lx inlet to lower border of cricoid ca

■ The laryngeal inlet:

~Boundaries

~Direction

~Opens into hypopharynx

■ Division:

*By 2 folds of MM:

-Vestibular folds(1)

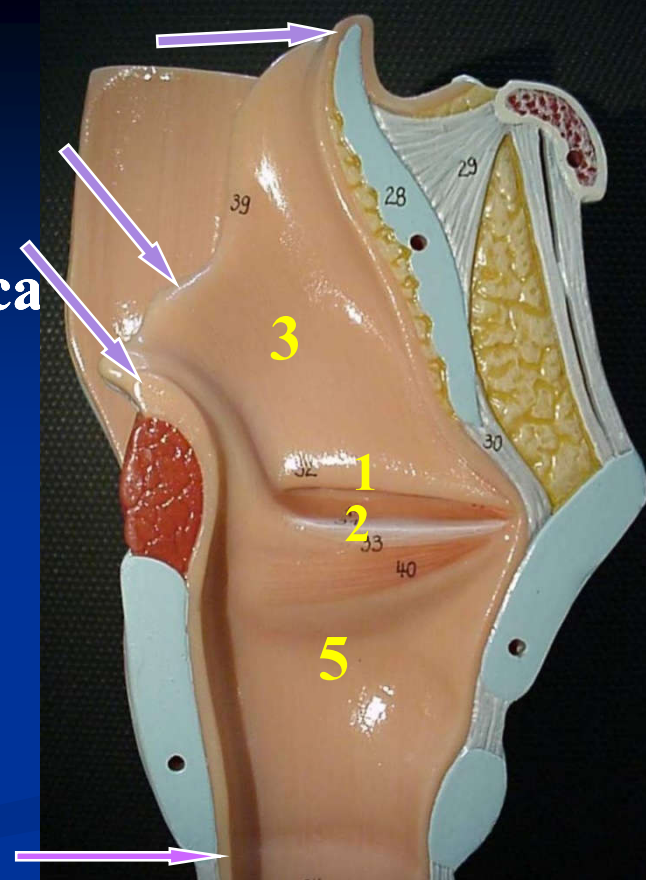
-Vocal folds (2)

*Divided into 3 parts:

-Vestibule (3)

-Ventricle (4)

-Subglottis (5)



(4) Anatomical regions: (compartments)

■ **Supraglottic region:**

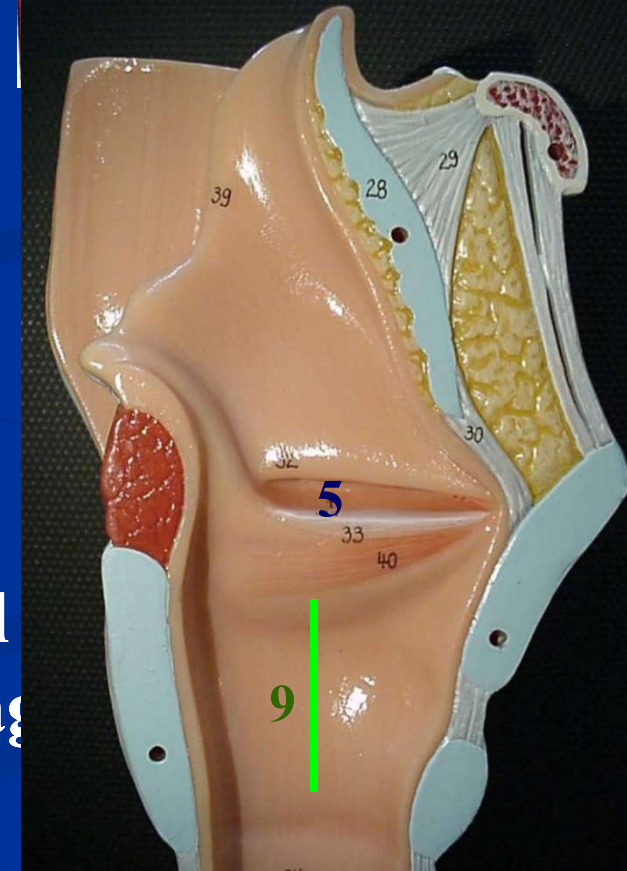
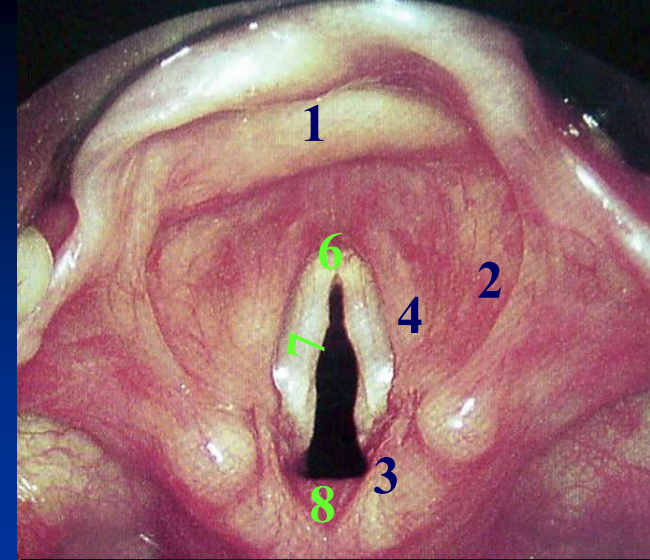
1. Epiglottis (Lx surface)
2. Aryepiglottic fold (inner aspect)
3. Arytenoids
4. Ventricular bands
5. Ventricles

■ **Glottic region:**

- 6- Anterior commissure
- 7- True vocal folds
- 8- Posterior commissure

■ **Subglottic region:**

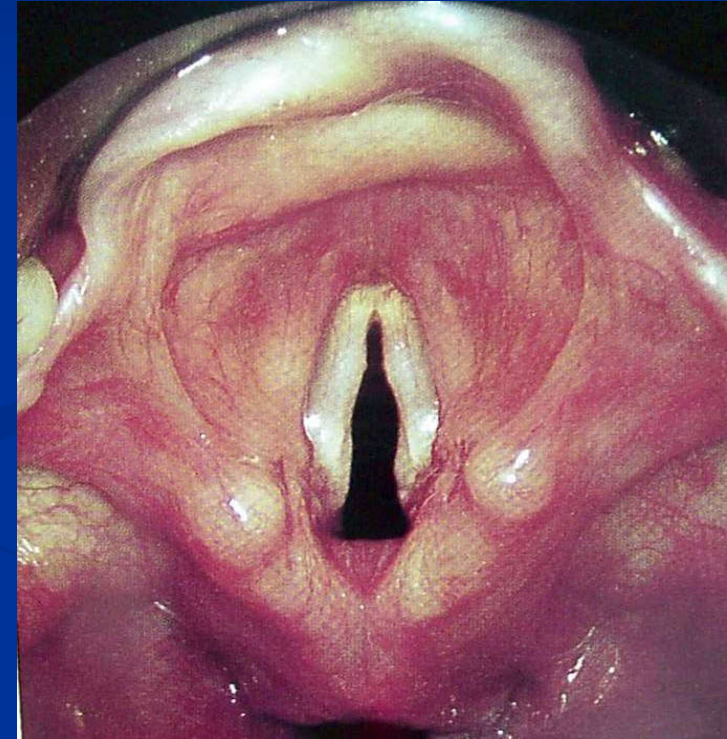
- 9- From 1 cm below free edge of vocal fold to lower border of cricoid cartilage



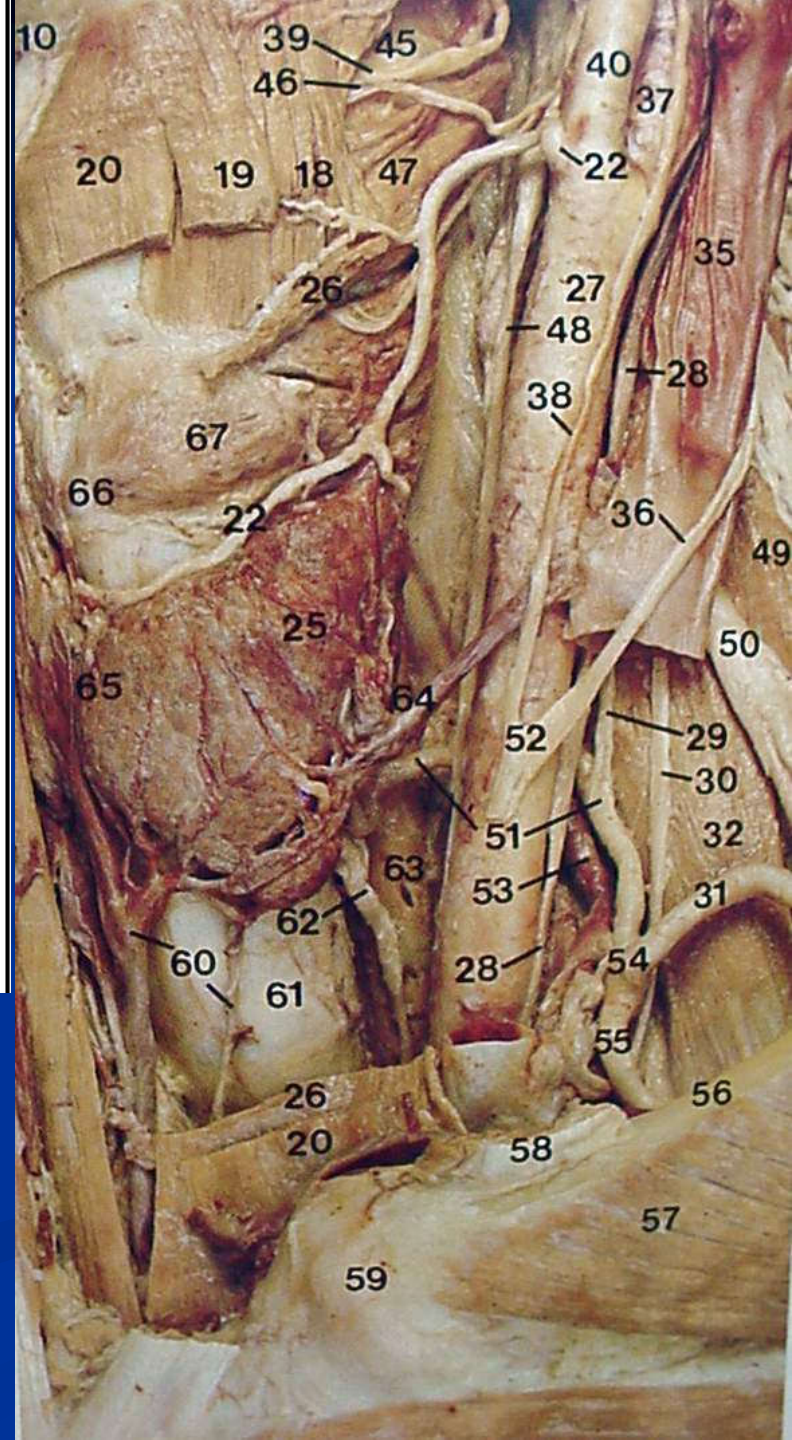
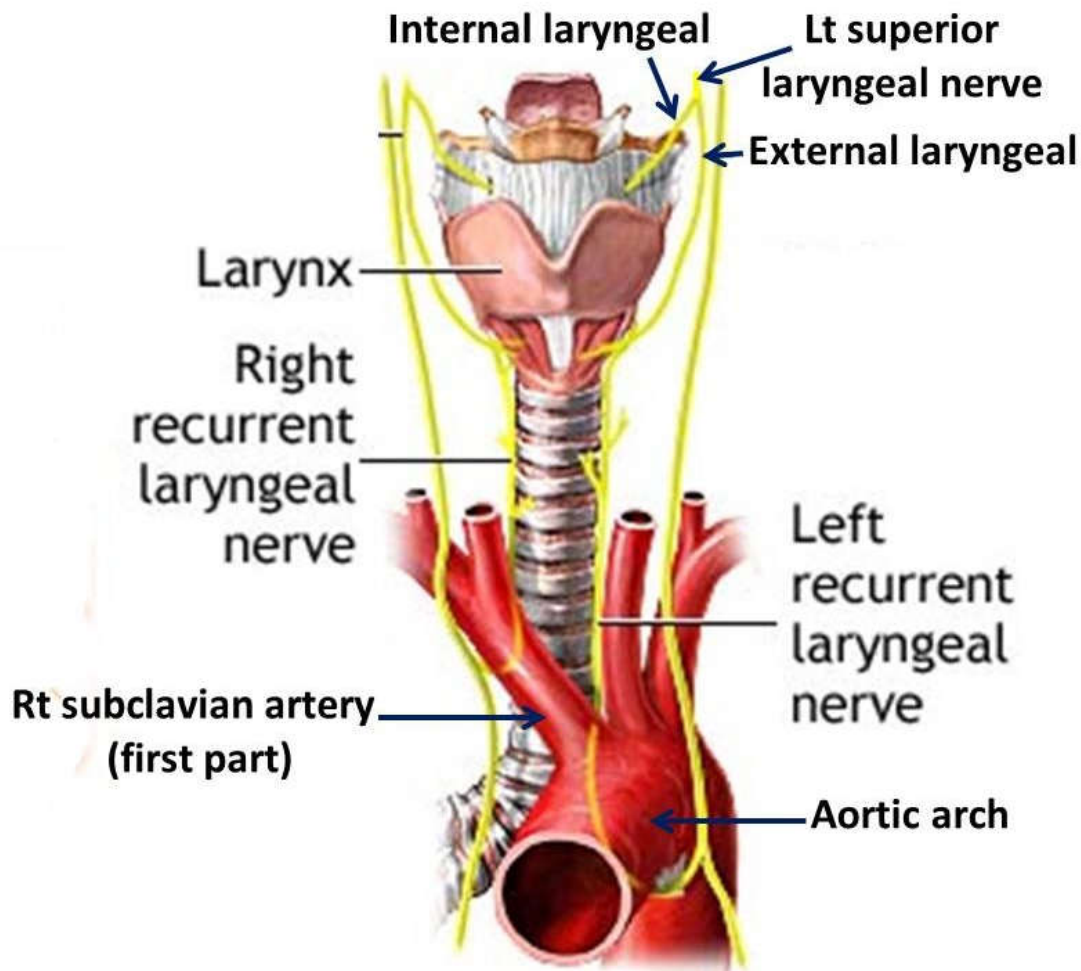
(5) Mucosal lining Of Larynx

■ **Pseudostratified columnar ciliated epithelium** except on:

- Upper part of Lx surface of epiglottis and aryepiglottic folds
- Posterior commissure
- Vocal folds



Where it is a **non-keratinized stratified squamous epithelium**



-External LxN (26): Motor, join sup thyroid art.

-Internal LxN (39): Sensory, join sup Lx art.

B* Recurrent Lx. N (62): arise from XN:

.Rt side: as it crosses 1st part of subclavian art.

.Lt side: as it crosses the arch of aorta.

-Crossed by or crosses inf. thyroid artery.

| | Motor | Sensory |
|---------------------------|---|---|
| Superior Lx nerve | .Cricothyroid muscle (External LxN) | .Supraglottic larynx (Internal Lx N) |
| Recurrent Lx nerve | .All intrinsic ms of Lx except cricothyroid. | .Glottic, subglottic larynx |

■ 3- Lymphatic drainage:

*Supraglottic:

- Rich lymphatic drainage
- Drains into upper, middle deep CxLNs.

*Glottic:

- No or scarce lymph vessels

*Subglottic:

- More sparse than supraglottis
- Drains into: .Pre-laryngeal LN .Pretracheal LN
.Lower deep CxLNs.

IV- Physiologic Anatomy

■ Respiratory airway

■ Airway Protection:

~Reflex closure ~Mechanical factors

~Reflex cough → → → →

■ Chest fixation (Effort closure):

During:

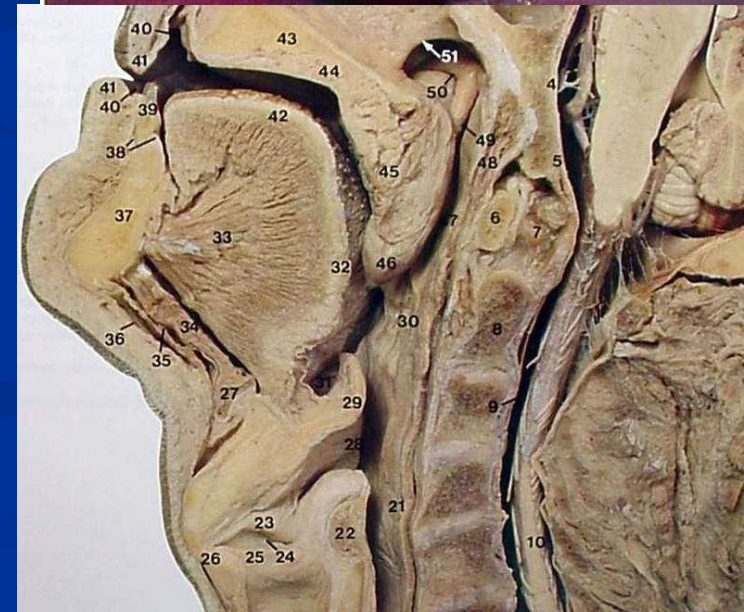
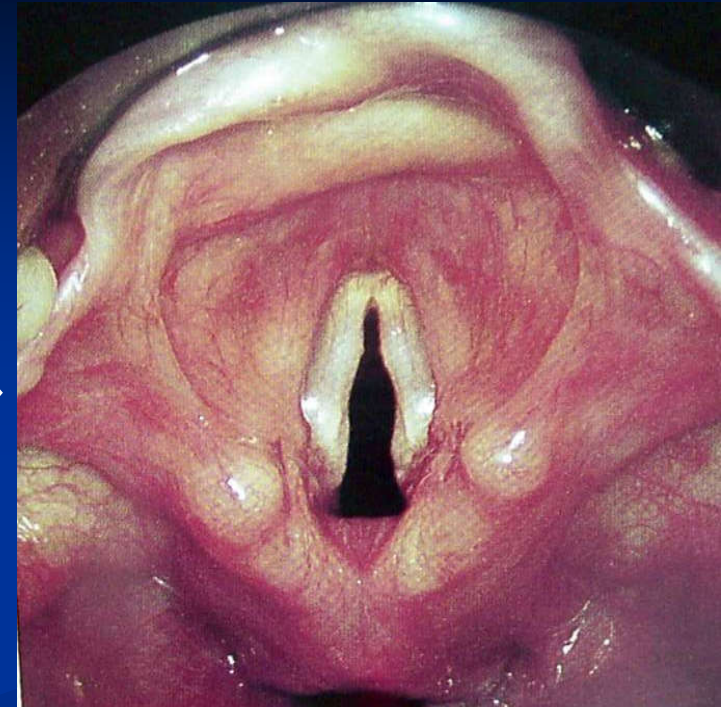
~Straining

~Climbing

~Carrying heavy objects

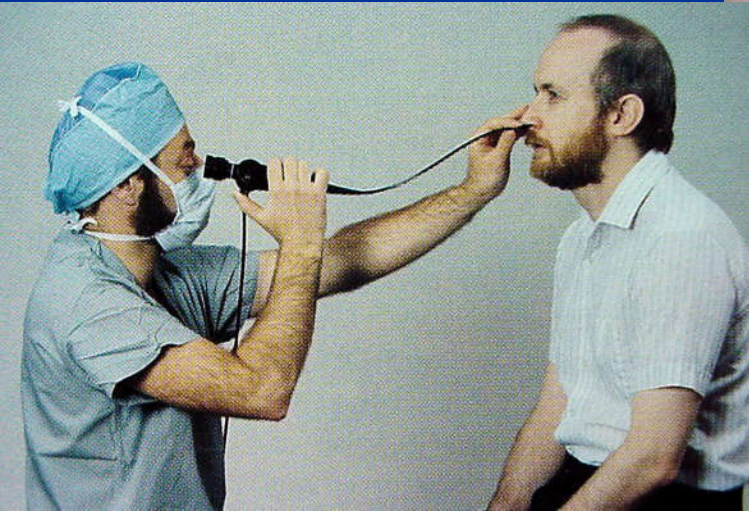
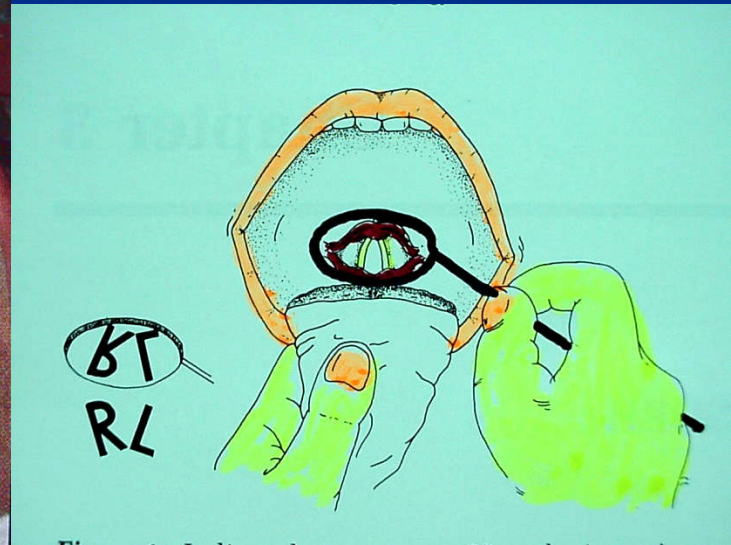
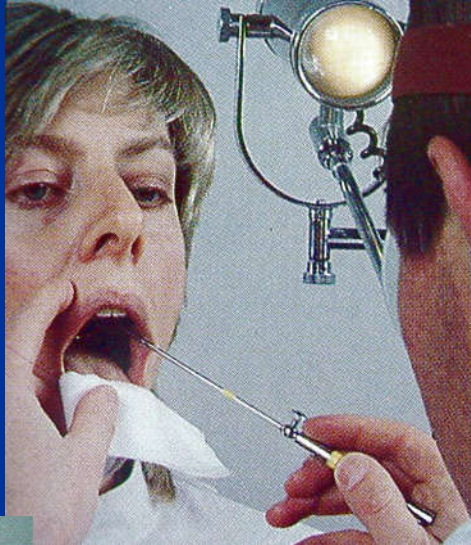
■ Voice production:

~By vibration of the adducted
and tensed vocal folds.



Examination Of The Larynx

- Indirect laryngoscopy
- Nasofiberscopic (telescopic) examination
- Direct laryngoscopy





**I'm advising
you to
study hard**

قاع المحيط مظلم إظلاماً كاملاً

“ أَوْ كَظُلُمَاتٍ فِي بَحْرٍ لُجِّيٍّ يَغْشَاهُ مَوْجٌ مِّنْ فَوْقِهِ مَوْجٌ مِّنْ فَوْقِهِ سَحَابٌ ظُلُمَاتٌ بَعْضُهَا فَوْقَ بَعْضٍ إِذَا أَخْرَجَ يَدُهُ لَمْ يَكَدْ يَرَاهَا وَمَنْ لَّمْ يَجْعَلِ اللَّهُ لَهُ نُورًا فَمَا لَهُ مِن نُّورٍ {النور: ٤٠} ”

جزء من قاع المحيط ليس على سطحه بل على السطحية

يتحرك الجزء الباقي داخل مياه البحر أو المحيط و يتحلل إلى أطيافه السبعة (أحمر-برتقالي-أصفر-أخضر-أزرق-نيلى-بنفسجى)

تُمتص هذه الأطياف بالتدرج و أول ما يمتص هو الطيف الأحمر و آخرها الطيف الأزرق الذى لا يتعدى ٢٠٠ متر (طبقة الضوء)

الطبقة من ٢٠٠-١٠٠٠ م تسمى طبقة شبه الضوء

على عمق ١٠٠٠ م توجد **أمواج عميقة** تفوق الأمواج السطحية بمئات المرات تعكس أى ضوء ممكن أن يصلها و تمنع نفاذه فتحدث ظلمة كاملة فى أعماق المحيطات بعد ١ كم و لا يرى الإنسان حتى يده

