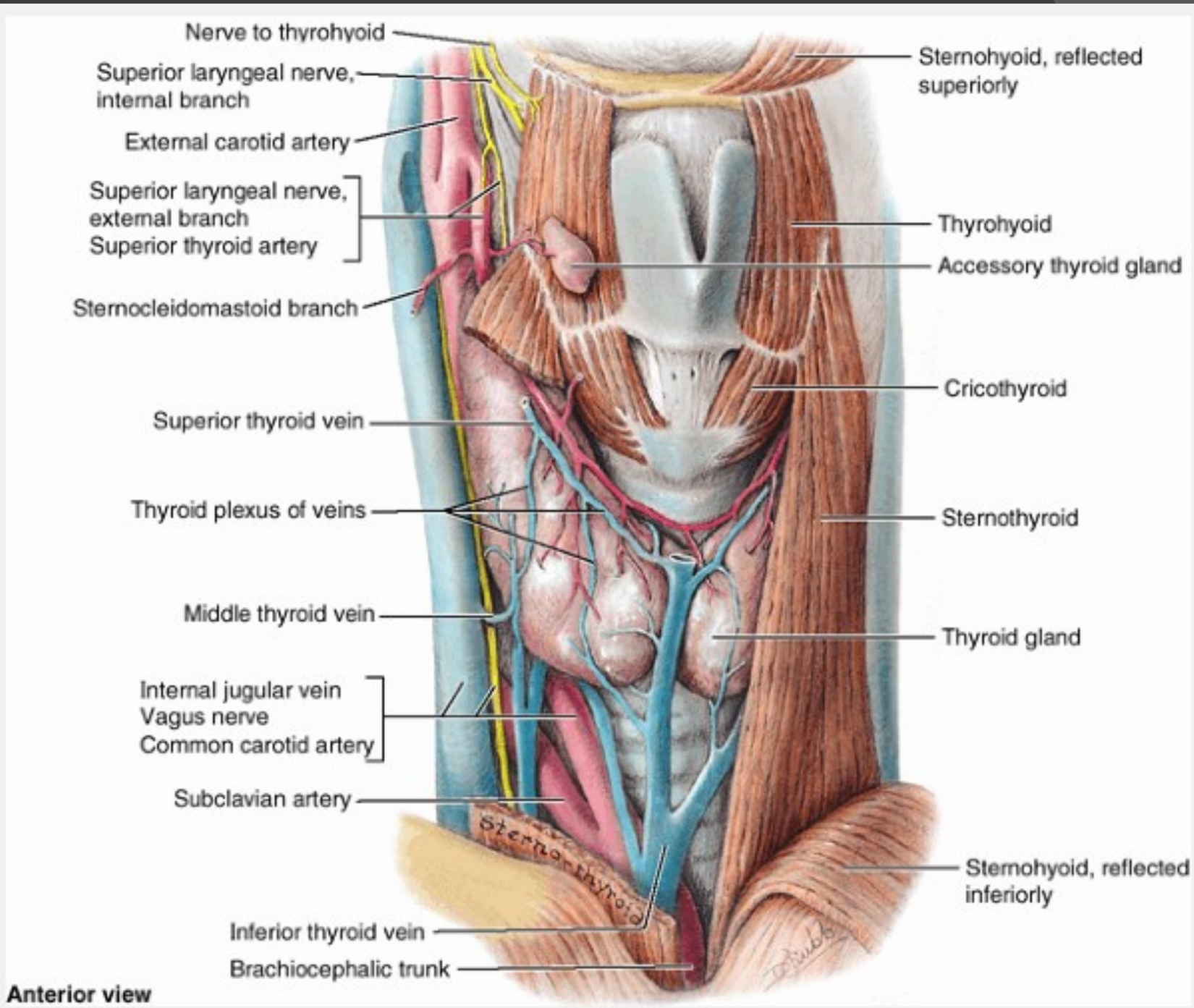
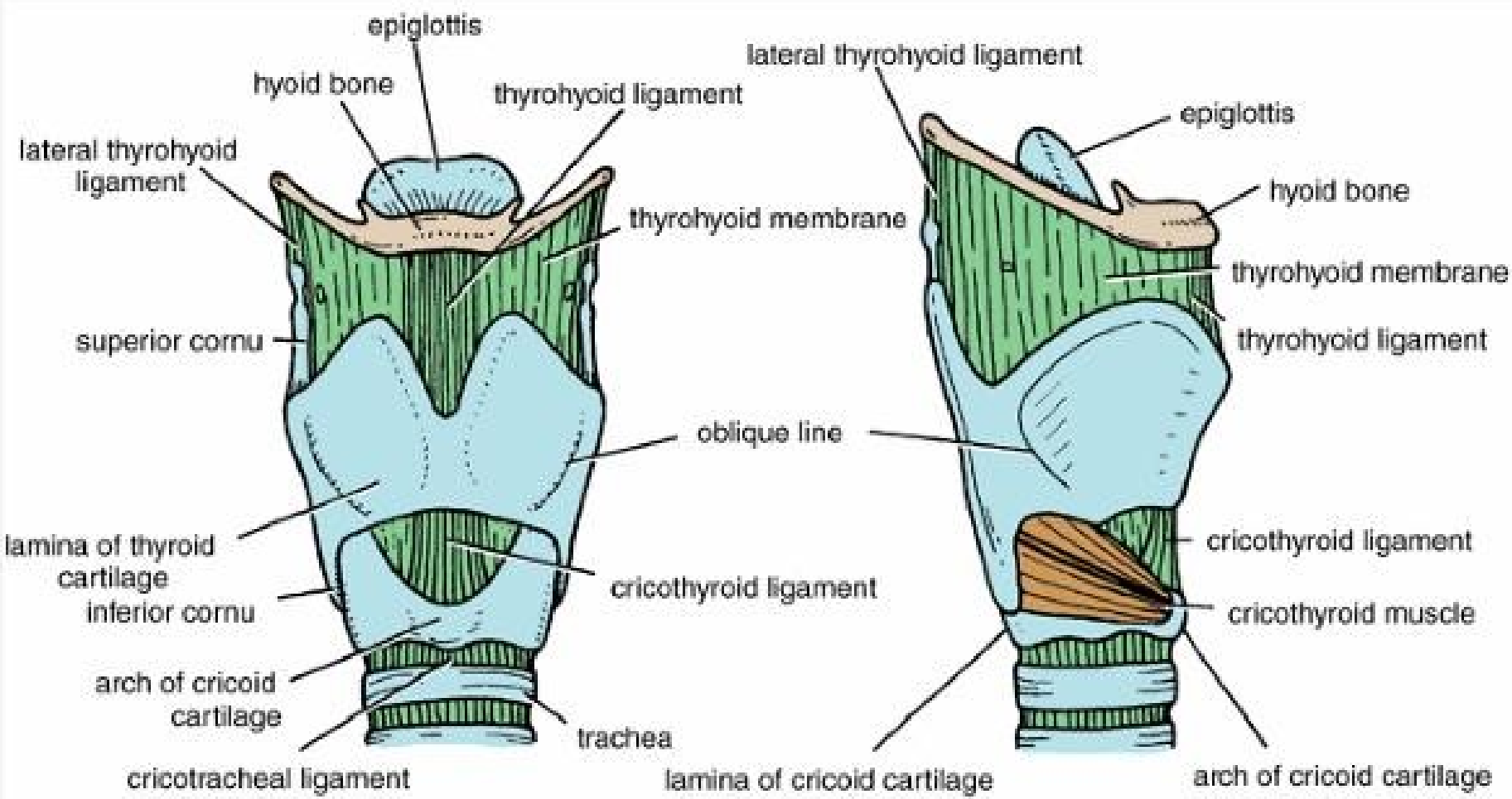
LARYNX

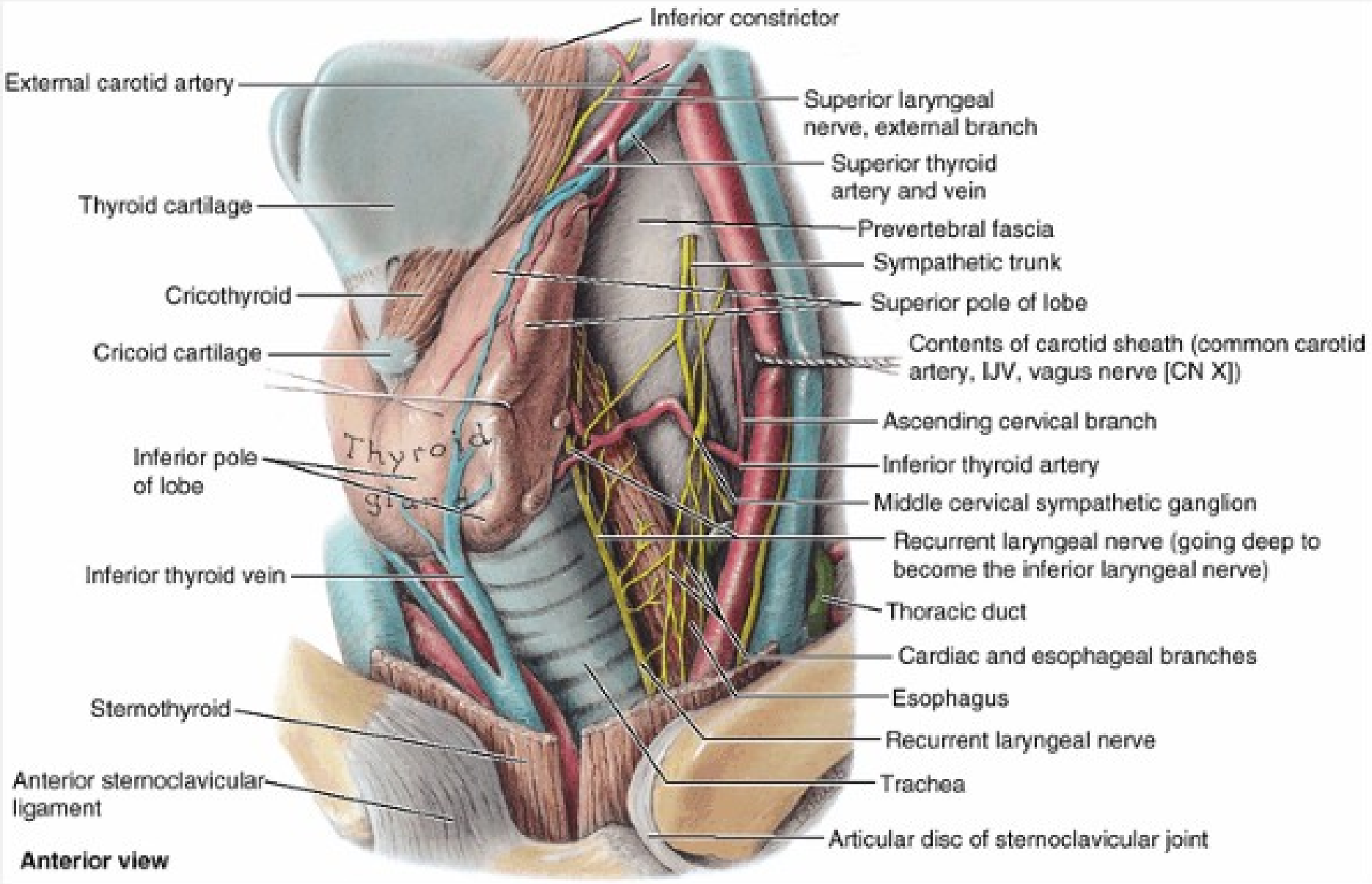
The larynx

- It is situated below the tongue and hyoid bone and
- It connects the inferior part of the pharynx (oropharynx or laryngopharynx) above with the trachea below
- It lies between the great blood vessels of the neck ,at the level of the fourth, fifth, and sixth cervical vertebrae.
- The larynx is covered in front by the infrahyoid strap muscles and at the sides by the thyroid gland.



Anterior view


epiglottis
hyoid bone
thyrohyoid ligament
lateral thyrohyoid ligament
thyrohyoid membrane
superior cornu
oblique line
lamina of thyroid cartilage
cricothyroid ligament
inferior cornu
arch of cricoid cartilage
trachea
cricotracheal ligament
A
lateral thyrohyoid ligament
epiglottis
hyoid bone
thyrohyoid membrane
thyrohyoid ligament
cricothyroid ligament
cricothyroid muscle
lamina of cricoid cartilage
arch of cricoid cartilage
B


Inferior constrictor
External carotid artery
Superior laryngeal nerve, external branch
Superior thyroid artery and vein
Thyroid cartilage
Prevertebral fascia
Sympathetic trunk
Cricothyroid
Superior pole of lobe
Contents of carotid sheath (common carotid artery, IJV, vagus nerve [CN X])
Cricoid cartilage
Ascending cervical branch
Thyroid gland
Inferior pole of lobe
Inferior thyroid artery
Middle cervical sympathetic ganglion
Recurrent laryngeal nerve (going deep to become the inferior laryngeal nerve)
Inferior thyroid vein
Thoracic duct
Cardiac and esophageal branches
Esophagus
Sternothyroid
Recurrent laryngeal nerve
Trachea
Anterior sternoclavicular ligament
Articular disc of sternoclavicular joint
Anterior view

Dimensions of the Larynx

- The average measurements of the larynx are listed in below. With increasing age, these diameters change. The larynx enlarges more in the male than in the female, a difference particularly notable in the magnitude of growth of the thyroid cartilages, resulting in the formation of the "Adam's apple."
- Average Measurements of the Larynx **Males**Length44 mm female length 36 mm
- Transverse diameter male 43 mm female 41 mm
- Sagittal diameter male36 mm female 26 mm

Functions of the larynx

1. Its most vital function is to guard the air passages and act as a protective sphincter at the inlet of the air passages , especially during swallowing thus maintaining a patent airway
2. It is responsible for voice production.

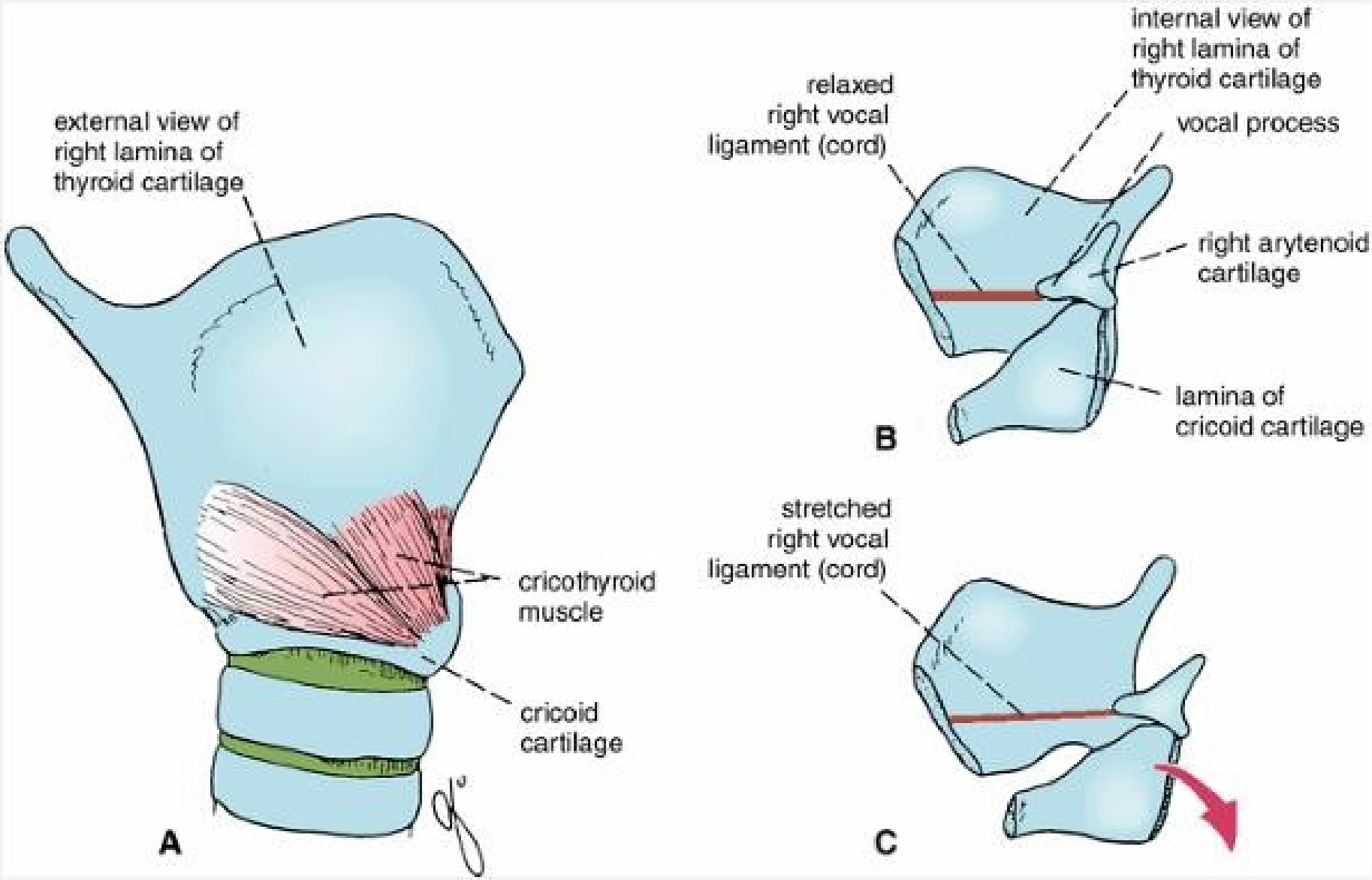
The framework of the larynx is formed of:-

1. cartilages that are held together by
2. ligaments and
3. membranes, moved by
4. muscles, and lined by
5. mucous membrane.

The laryngeal skeleton consists of nine cartilages:

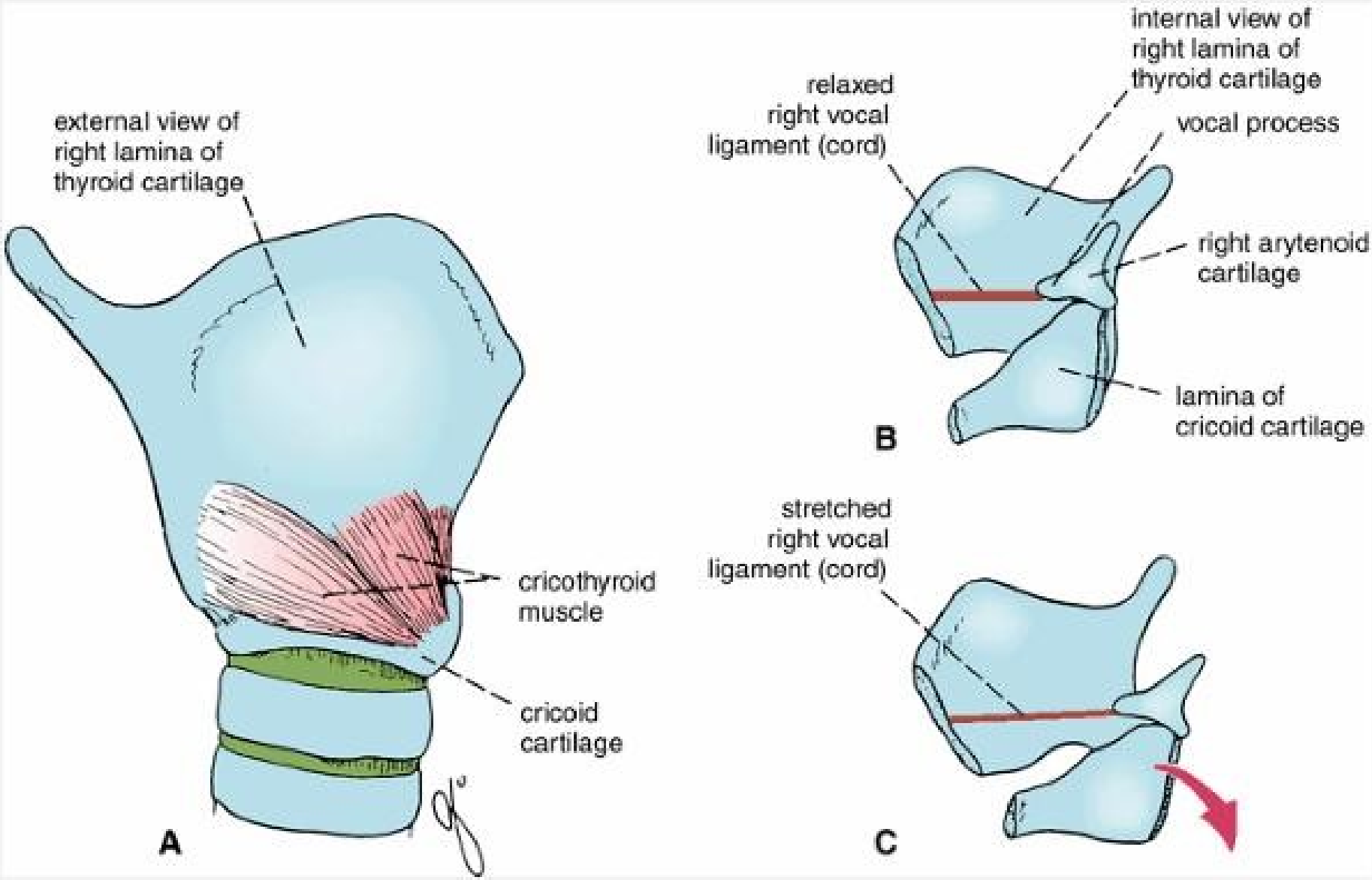
- three are single
1. thyroid
2. cricoid
3. epiglottic

- three are paired
1. arytenoid
2. corniculate
3. cuneiform


external view of
right lamina of
thyroid cartilage
cricothyroid
muscle
cricoid
cartilage
A
internal view of
right lamina of
thyroid cartilage
relaxed
right vocal
ligament (cord)
vocal process
right arytenoid
cartilage
lamina of
cricoid cartilage
B
stretched
right vocal
ligament (cord)
C

Thyroid cartilage

- This is the largest cartilage of the larynx
- consists of two laminae of hyaline cartilage that meet in the midline in the prominent V angle (the so-called Adam's apple).
- The posterior border extends upward into a superior cornu and downward into an inferior cornu.
- On the outer surface of each lamina is an oblique line for the attachment of muscles.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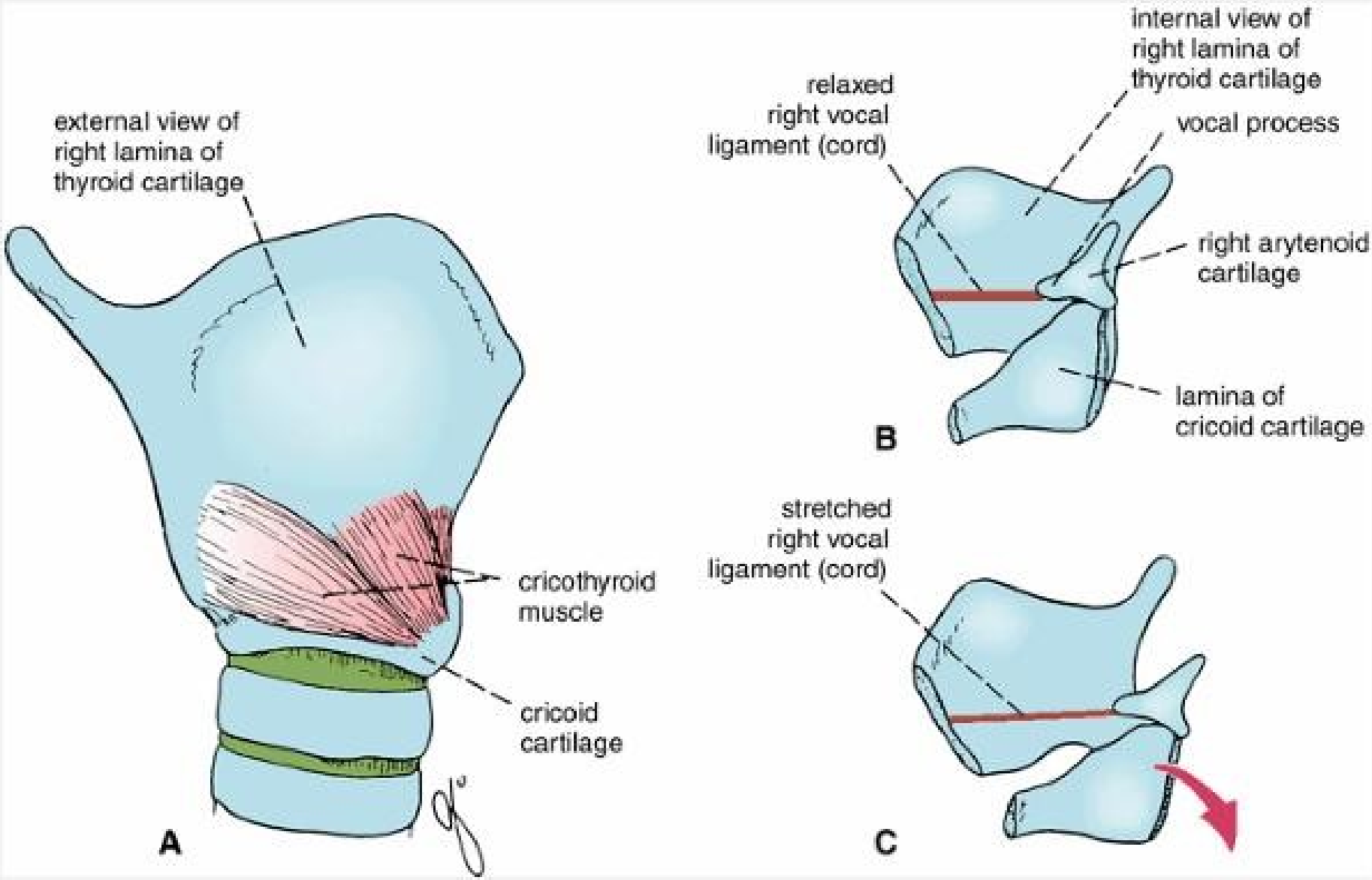
lamina of
cricoid cartilage
B
stretched
right vocal
ligament (cord)
C

Cricoid cartilage

- This cartilage is formed of hyaline cartilage
- shaped like a signet ring, having a broad plate behind and a shallow arch in front.
- It lies below the thyroid cartilage
- on each side of the lateral surface is a facet for articulation with the inferior cornu of the thyroid cartilage.
- Posteriorly, the lamina has on its upper border on each side a facet for articulation with the arytenoid cartilage.
- All these joints are synovial.

Arytenoid cartilages

- There are two arytenoid cartilages, which are
- small and pyramid shaped and
- located at the back of the larynx.
- They articulate with the upper border of the lamina of the cricoid cartilage.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Arytenoid cartilages

- Each cartilage has:

1. an apex above that articulates with the small corniculate cartilage,
2. a base below that articulates with the lamina of the cricoid cartilage
3. a vocal process that projects forward and gives attachment to the vocal ligament.
4. A muscular process that projects laterally gives attachment to the posterior and lateral cricoarytenoid muscles.

Corniculate cartilages

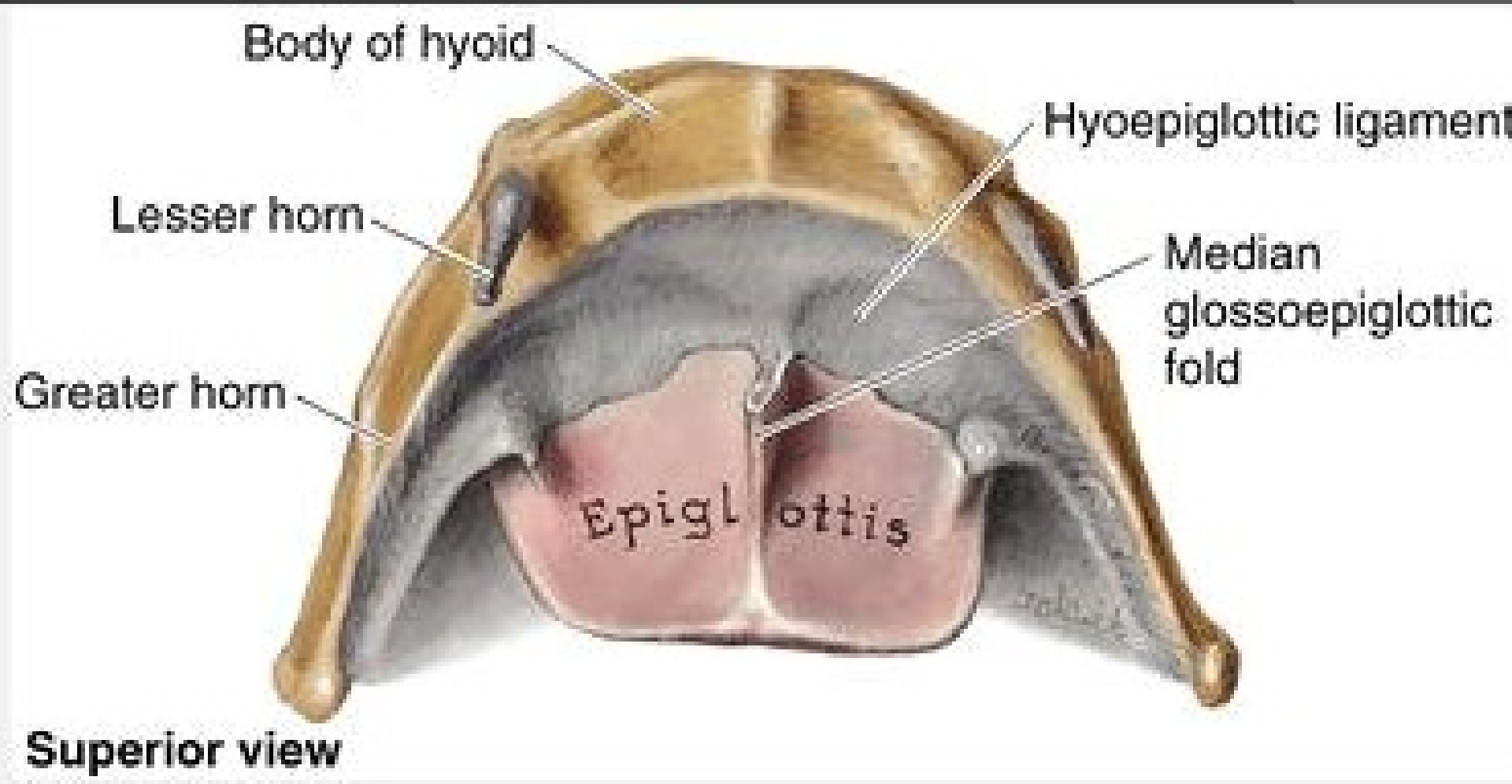
- Two small conical-shaped cartilages
- articulate with the arytenoid cartilages.
- They give attachment to the aryepiglottic folds.

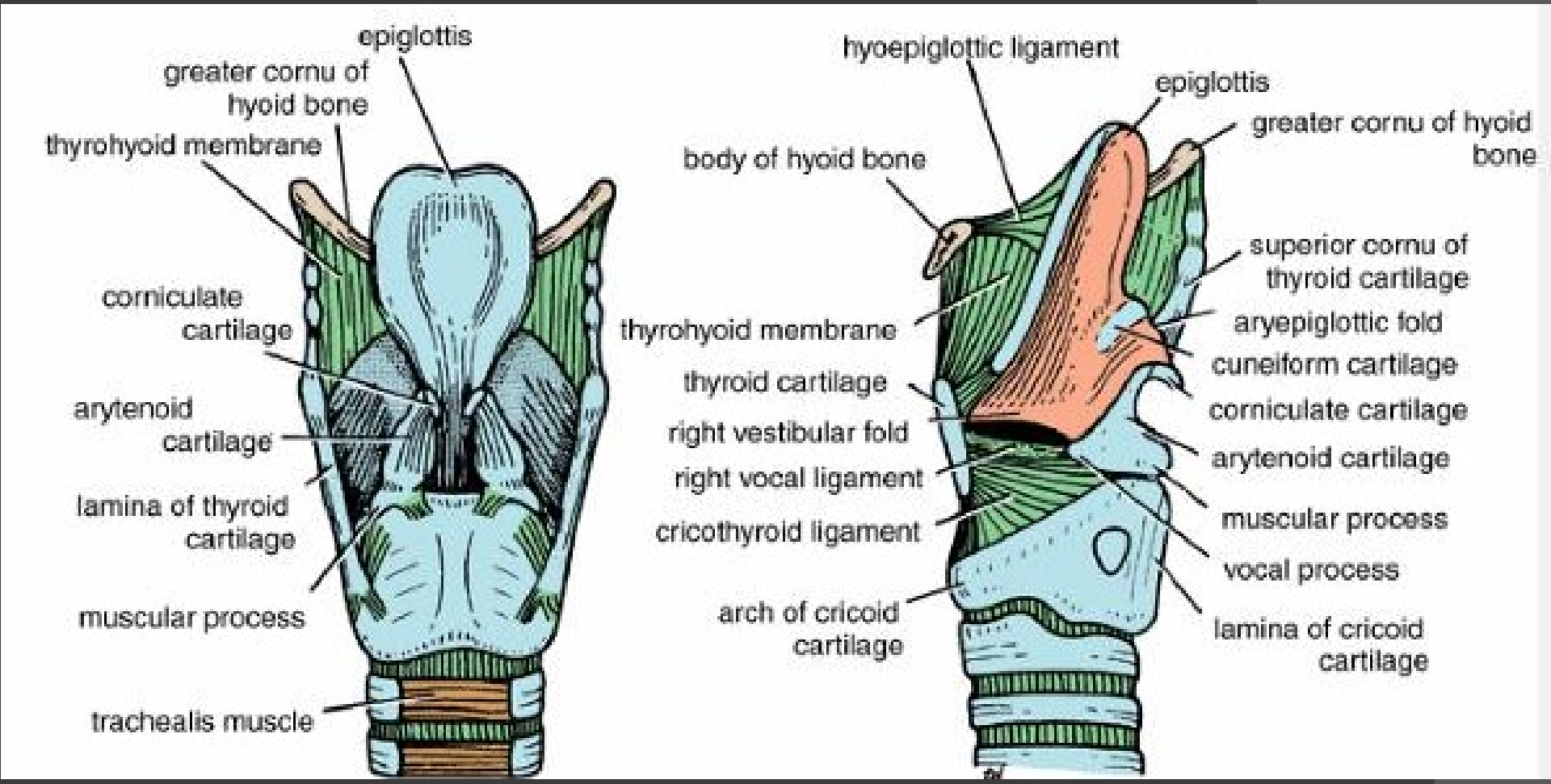
Cuneiform cartilages

- Are two small rod-shaped cartilages
- found in the aryepiglottic folds and serve to strengthen them.

Epiglottis

- It is leaf-shaped lamina of elastic cartilage
- lies behind the root of the tongue.
- Its stalk is attached to the back of the thyroid cartilage.
- The sides of the epiglottis are attached to the arytenoid cartilages by the aryepiglottic folds of mucous membrane.
- The upper edge of the epiglottis is free.
- The covering of mucous membrane passes forward onto the posterior surface of the tongue as the median glossoepiglottic fold
- the depression on each side of the median glossoepiglottic fold is called the vallecula.
- Laterally the mucous membrane passes onto the wall of the pharynx as the lateral glossoepiglottic fold.


Body of hyoid
Hyoepiglottic ligament
Lesser horn
Median glossoepiglottic fold
Greater horn
Epiglottis
Superior view


epiglottis
greater cornu of hyoid bone
thyrohyoid membrane
corniculate cartilage
arytenoid cartilage
lamina of thyroid cartilage
muscular process
trachealis muscle
hyoepiglottic ligament
epiglottis
greater cornu of hyoid bone
body of hyoid bone
superior cornu of thyroid cartilage
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aryepiglottic fold
thyroid cartilage
cuneiform cartilage
right vestibular fold
corniculate cartilage
right vocal ligament
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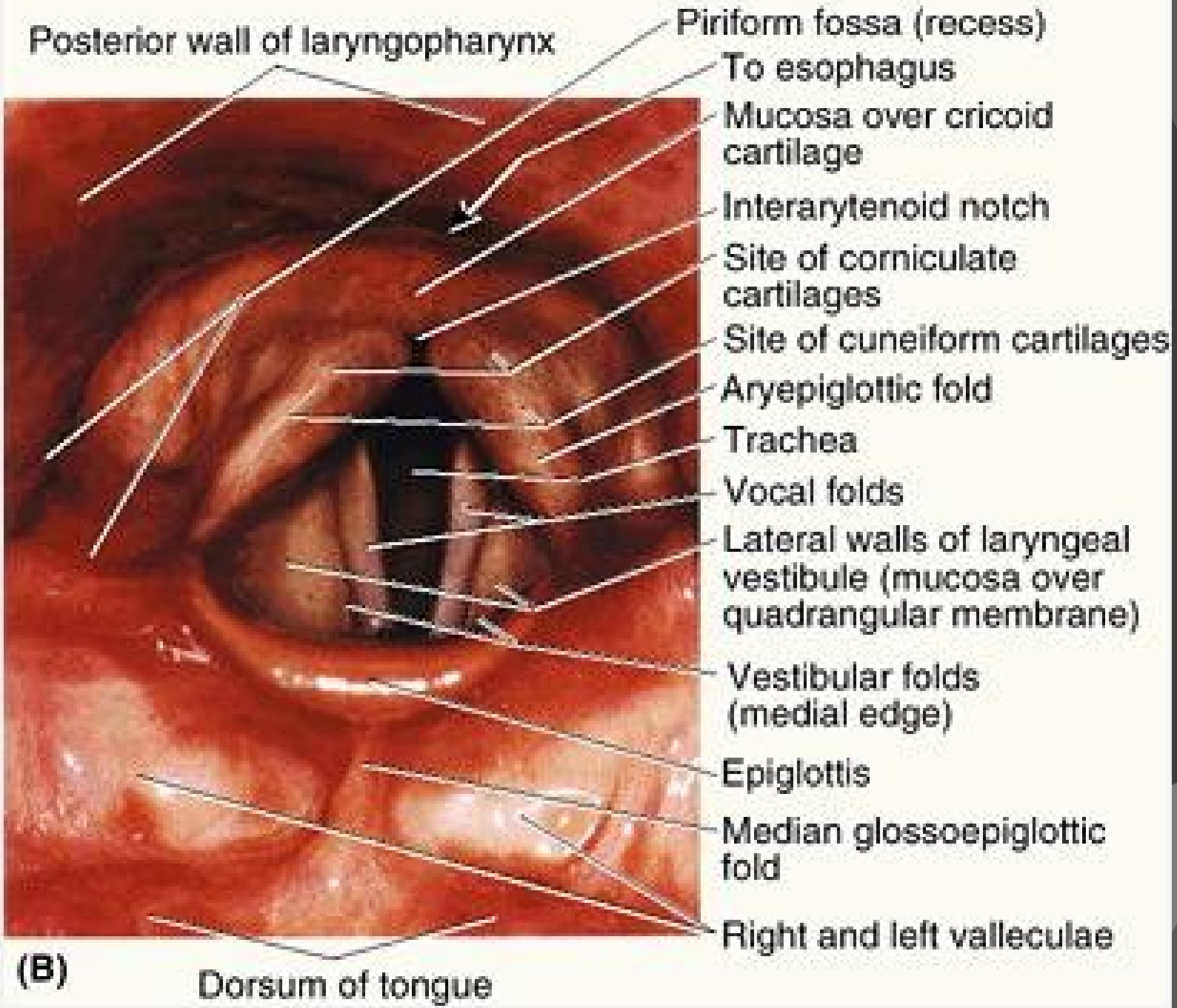
cricothyroid ligament
muscular process
vocal process
arch of cricoid cartilage
lamina of cricoid cartilage


Posterior wall of laryngopharynx
Piriform fossa (recess)
To esophagus
Mucosa over cricoid cartilage
Interarytenoid notch
Site of corniculate cartilages
Site of cuneiform cartilages
Aryepiglottic fold
Trachea
Vocal folds
Lateral walls of laryngeal vestibule (mucosa over quadrangular membrane)
Vestibular folds (medial edge)
Epiglottis
Median glossoepiglottic fold
Right and left valleculae
(B)
Dorsum of tongue

- The end of the first part of the larynx

Membranes and Ligaments of the Larynx

1. **Thyrohyoid membrane**:

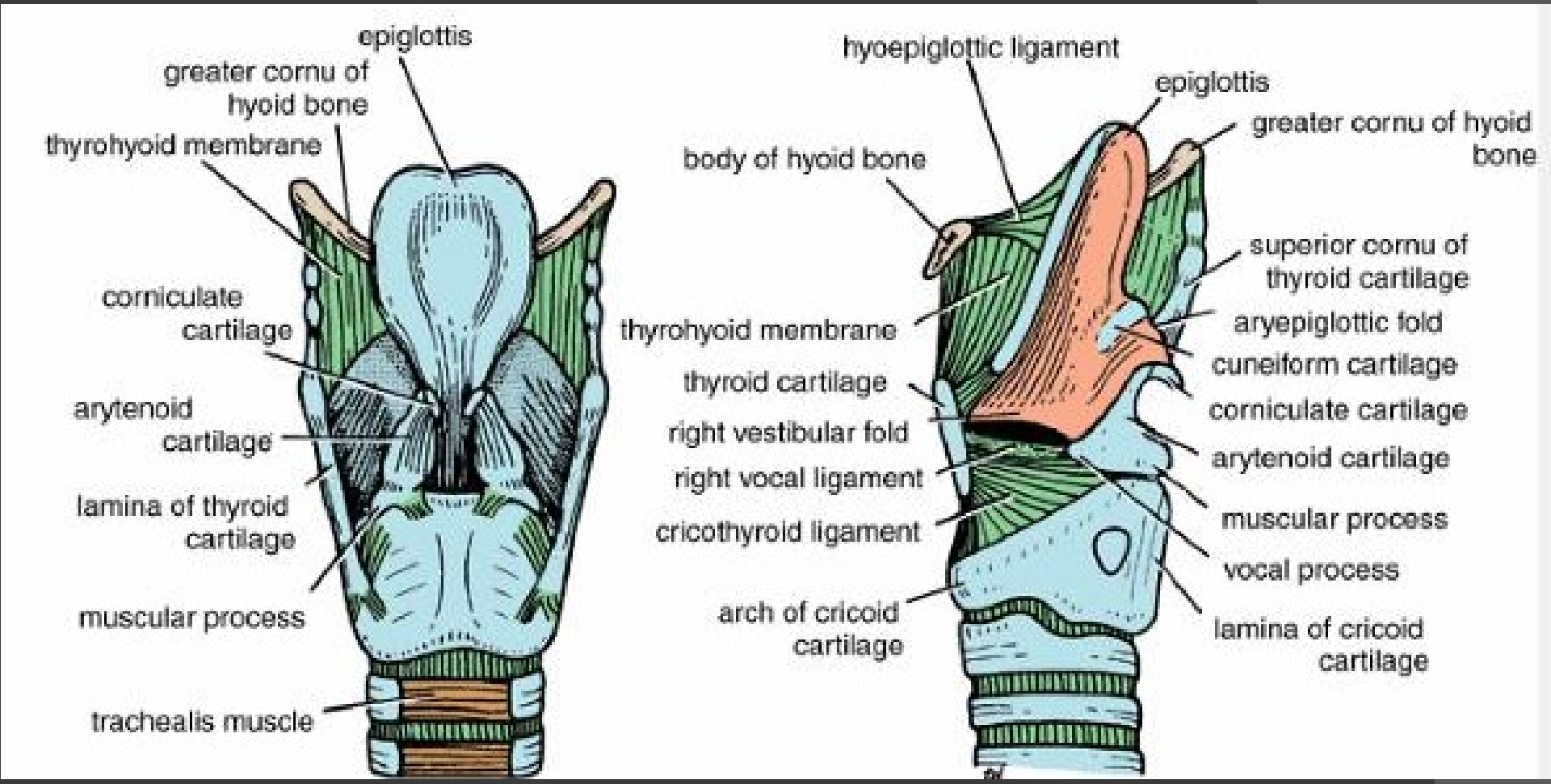
- This connects the upper margin of the thyroid cartilage to the hyoid bone .
- In the midline it is thickened to form the median thyrohyoid ligament.
- The membrane is pierced on each side by the superior laryngeal vessels and the **internal laryngeal nerve**, *a branch of the superior laryngeal nerve.*

Cricotracheal ligament

- This connects the cricoid cartilage to the first ring of the trachea.

Quadrangular membrane

- This extends between the epiglottis and the arytenoid cartilages.
- Its thickened inferior margin forms the vestibular ligament, and the vestibular ligaments form the interior of the vestibular folds.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right vocal ligament
arytenoid cartilage
cricothyroid ligament
muscular process
vocal process
arch of cricoid cartilage
lamina of cricoid cartilage

Inlet of the Larynx

- The inlet of the larynx looks backward and upward into the laryngeal part of the pharynx
- The opening is wider in front than behind ..

Inlet of the Larynx

- It is bounded by :

1. in front by the epiglottis,
2. laterally by the aryepiglottic fold of mucous membrane, The cuneiform cartilage lies within and strengthens the aryepiglottic fold and produces a small elevation on the upper border
3. posteriorly by the arytenoid cartilages with the corniculate cartilages.

Inlet of the Larynx

- The piriform fossa is a recess on either side of the fold and inlet.
- It is bounded by

1. medially by the aryepiglottic fold
2. laterally by the thyroid cartilage and the thyrohyoid membrane.

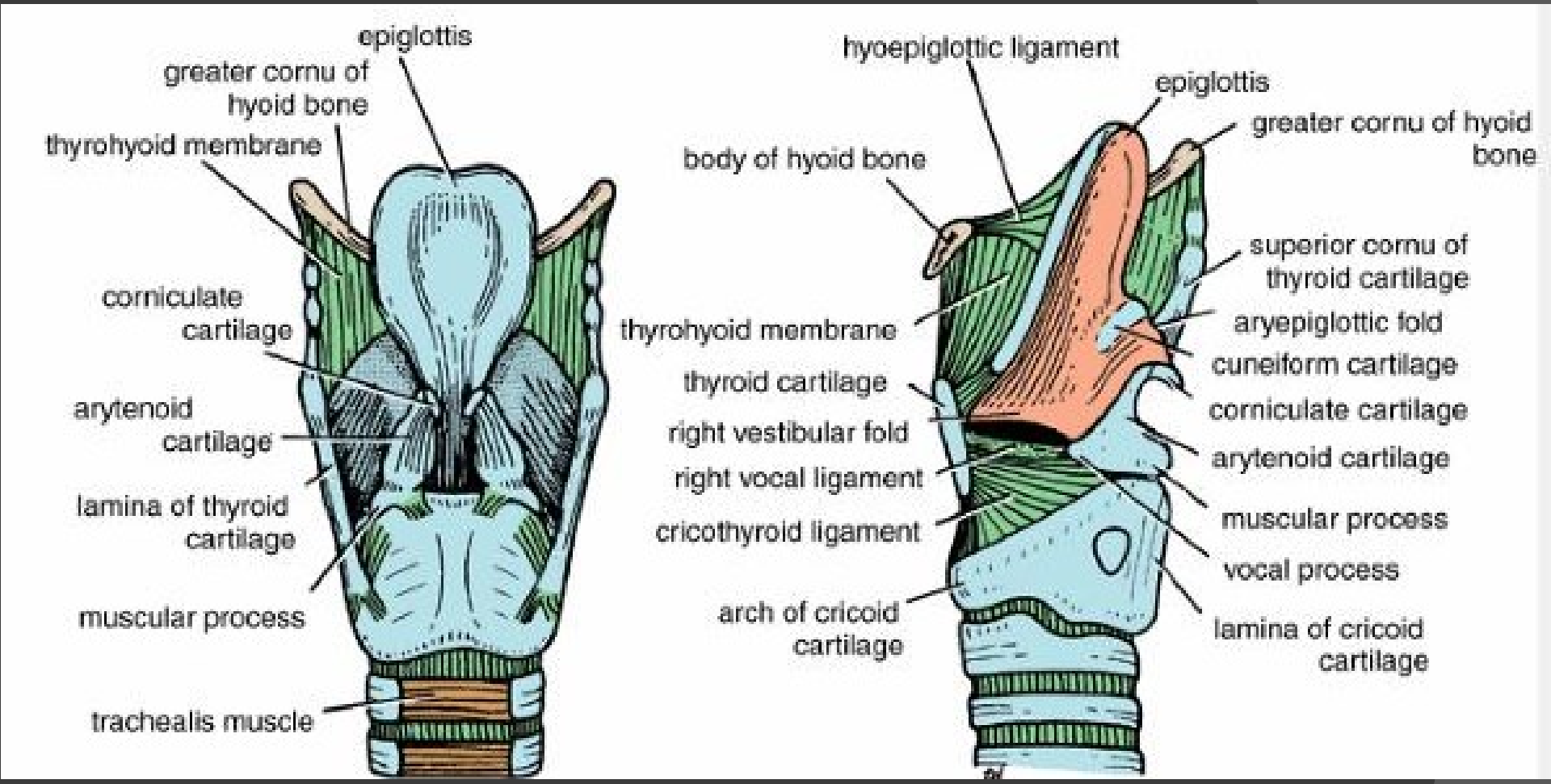
Laryngeal Folds

1. Vestibular Fold
2. Vocal Fold (Vocal Cord)

Laryngeal Folds

1. Vestibular Fold

- The vestibular fold is a fixed fold on each side of the larynx .
- It is formed by mucous membrane covering the vestibular ligament and is vascular and pink in color.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muscular process
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arch of cricoid cartilage
lamina of cricoid cartilage

Laryngeal Folds

2. Vocal Fold (Vocal Cord)

- The vocal fold is a mobile fold on each side of the larynx and is concerned with voice production.
- It is formed by mucous membrane covering the vocal ligament and is a vascular and white in color.
- The vocal fold moves with respiration and its white color is easily seen when viewed with a laryngoscope.

The glottis

- The gap between the vocal folds is called the rima glottidis or glottis.
- The glottis is bounded in front by the vocal folds and behind by the medial surface of the arytenoid cartilages.
- The glottis is the narrowest part of the larynx and measures about 2.5 cm from front to back in the male adult and less in the female.
- In children the lower part of the larynx within the cricoid cartilage is the narrowest part.

Cavity of the Larynx

- The cavity of the larynx extends from the inlet to the lower border of the cricoid cartilage, where it is continuous with the cavity of the trachea.
- It is divided into three regions:

1. The vestibule, which is situated between the inlet and the vestibular folds
2. The middle region, which is situated between the vestibular folds above and the vocal folds below
3. The lower region, which is situated between the vocal folds above and the lower border of the cricoid cartilage below

Cavity of the Larynx

- The sinus of the larynx is a small recess on each side of the larynx situated between the vestibular and vocal folds. It is lined with mucous membrane
- The saccule of the larynx is a diverticulum of mucous membrane that ascends from the sinus. The mucous secretion lubricates the vocal cords.

Muscles of the Larynx

- The muscles of the larynx may be divided into two groups:

1. Extrinsic
2. intrinsic.

Extrinsic Muscles

- These muscles move the larynx up and down during swallowing.
- Note that many of these muscles are attached to the hyoid bone, which is attached to the thyroid cartilage by the thyrohyoid membrane.

Extrinsic Muscles

- It follows that movements of the hyoid bone are accompanied by movements of the larynx.
- **Elevation: The digastric, the stylohyoid, the mylohyoid, the geniohyoid, the stylopharyngeus, the salpingopharyngeus, and the palatopharyngeus muscles**

- Depression: The sternothyroid, the sternohyoid, and the omohyoid muscles

Intrinsic Muscles

- Two muscles modify the laryngeal inlet :

1. Narrowing the inlet:
   - The oblique arytenoid muscle

2. Widening the inlet:
   - The thyroepiglottic muscle

Intrinsic Muscles

- Five muscles move the vocal folds (cords):

1. Tensing the vocal cords: The cricothyroid muscle
2. Relaxing the vocal cords: The thyroarytenoid (vocalis) muscle
3. Adducting the vocal cords: The lateral cricoarytenoid muscle
4. Abducting the vocal cords: The posterior cricoarytenoid muscle
5. Approximates the arytenoid cartilages: The transverse arytenoid muscle

Movements of the Vocal Folds (Cords)

- The movements of the vocal folds depend on the movements of the arytenoid cartilages, which rotate and slide up and down on the sloping shoulder of the superior border of the cricoid cartilage.

Movements of the Vocal Folds (Cords)

- The rima glottidis is opened by the contraction of the posterior cricoarytenoid, which rotates the arytenoid cartilage and abducts the *vocal process.*
- The elastic tissue in the capsules of the cricoarytenoid joints keeps the arytenoid cartilages apart so that the posterior part of the glottis is open.

Movements of the Vocal Folds With Respiration

A. On quiet inspiration

- the vocal folds are abducted and the rima glottidis is triangular in shape with the apex in front .

B. On deep inspiration

- the vocal folds are maximally abducted and the triangular shape of the glottis becomes a diamond shape because of the maximal lateral rotation of the arytenoid cartilages.
- On expiration the vocal folds are adducted, leaving a small gap between them.

Sphincteric Function of the Larynx

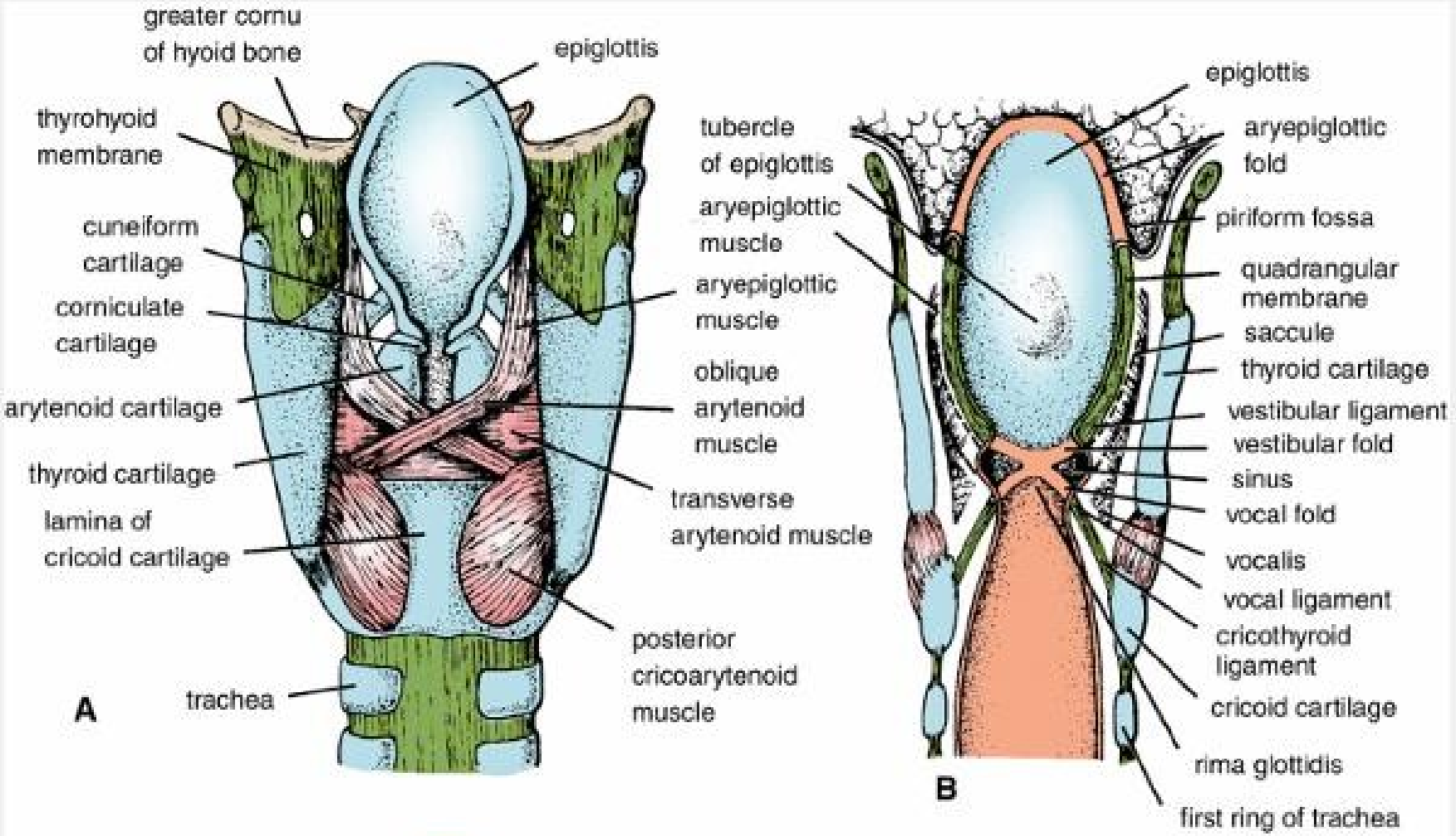
- There are two sphincters in the larynx:

1. at the inlet and
2. at the rima glottidis.

Sphincteric Function of the Larynx

- The sphincter at the inlet
  - is used only during swallowing.
  - As the bolus of food is passed backward between the tongue and the hard palate,

1. the larynx is pulled up beneath the back of the tongue.
2. The inlet is narrowed by the action of the oblique arytenoid and aryepiglottic muscles.
3. The epiglottis is pulled backward by the tongue and serves as a cap over the laryngeal inlet.
4. The bolus of food, or fluids, then enters the esophagus by passing over the epiglottis or moving down the grooves on either side of the laryngeal inlet, the piriform fossae.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transverse arytenoid muscle
posterior cricoarytenoid muscle
epiglottis
aryepiglottic fold
piriform fossa
quadrangular membrane
saccule
thyroid cartilage
vestibular ligament
vestibular fold
sinus
vocal fold
vocalis
vocal ligament
cricothyroid ligament
cricoid cartilage
rima glottidis
first ring of trachea
B

Sphincteric Function of the Larynx

- The sphincter at the rima glottidis

a) serves as a sphincter in coughing or sneezing.

- After inspiration,

1. the vocal folds are adducted, and
2. the muscles of expiration are made to contract strongly.

- As a result, the intrathoracic pressure rises, and the vocal folds are suddenly abducted.
- The sudden release of the compressed air will often dislodge foreign particles or mucus from the respiratory tract and carry the material up into the pharynx, where the material is either swallowed or expectorated.

Sphincteric Function of the Larynx

b) In the Valsalva maneuver, forced expiration takes place against a closed glottis.

c) In abdominal straining associated with micturition, defecation, and parturition, air is often held temporarily in the respiratory tract by closing the rima glottidis. After deep inspiration the rima glottidis is closed. The muscles of the anterior abdominal wall now contract, and the upward movement of the diaphragm is prevented by the presence of compressed air within the respiratory tract. After a prolonged effort the person often releases some of the air by momentarily opening the rima glottidis, producing a grunting sound.

Voice Production in the Larynx

- The intermittent release of expired air between the adducted vocal folds results in their vibration and in the production of sound.
- The frequency, or pitch, of the sound is determined by changes in the length and tension of the vocal ligaments.
- The quality of the voice depends on the resonators above the larynx, namely, the pharynx, mouth, and paranasal sinuses.
- The quality of the voice is controlled by the muscles of the soft plate, tongue, floor of the mouth, cheeks, lips, and jaws.
- Normal speech depends on the modification of the sound into recognizable consonants and vowels by the use of the tongue, teeth, and lips.
- Vowel sounds are usually purely oral with the soft palate raised so that the air is channeled through the mouth rather than the nose.

Voice Production in the Larynx

- Speech involves the intermittent release of expired air between the adducted vocal folds.
- Singing a note requires a more prolonged release of the expired air between the adducted vocal folds.
- In whispering, the vocal folds are adducted, but the arytenoid cartilages are separated; the vibrations are given to a constant stream of expired air that passes through the posterior part of the rima glottidis.

Mucous Membrane of the Larynx

- lines the cavity
- is covered with ciliated columnar epithelium.
- is covered with stratified squamous epithelium on the vocal cords,because the mucous membrane is subject to repeated trauma during phonation

Nerve Supply of the Larynx

- Sensory Nerves

1. Above the vocal cords: The internal laryngeal branch of the superior laryngeal branch of the vagus
2. *Below* the level of the vocal cords: The recurrent laryngeal nerve

Motor Nerves

- All the intrinsic muscles of the larynx except the cricothyroid muscle are supplied by the recurrent laryngeal nerve.
- The cricothyroid muscle is supplied by the external laryngeal branch of the superior laryngeal branch of the vagus.

blood Supply of the Larynx

- Upper half of the larynx: The superior laryngeal branch of the superior thyroid artery
- Lower half of the larynx: The inferior laryngeal branch of the inferior thyroid artery

Lymph Drainage of the Larynx

- The lymph vessels drain into the deep cervical group of nodes.

Clinical Notes
Lesions of the Laryngeal Nerves

- the nerves of the larynx are vulnerable during operations on the thyroid gland because of the close relationship between them and the arteries of the gland.
- The left recurrent laryngeal nerve may be involved in a bronchial or esophageal carcinoma or in secondary metastatic deposits in the mediastinal lymph nodes.
- The right and left recurrent laryngeal nerves may be damaged by malignant involvement of the deep cervical lymph nodes.

Lesions of the Laryngeal Nerves

- Section of the external laryngeal nerve produces weakness of the voice because the vocal fold cannot be tensed. The cricothyroid muscle is paralyzed.

Edema of the Laryngeal Mucous Membrane

- The mucous membrane of the larynx is loosely attached to the underlying structures by submucous connective tissue. In the region of the vocal folds, however, the mucous membrane is firmly attached to the vocal ligaments. This fact is of clinical importance in cases of edema of the larynx. The accumulation of tissue fluid causes the mucous membrane above the rima glottidis to swell and encroach on the airway. In severe cases, a cricothyroidotomy or tracheostomy may be necessary

Laryngeal Mirror and Laryngoscope

- The interior of the larynx can be inspected indirectly through a laryngeal mirror passed through the open mouth into the oral pharynx.
- A more satisfactory method is the direct method using the laryngoscope.
- The valleculae, the piriform fossae, the epiglottis, and the aryepiglottic folds are clearly seen.
- The two elevations produced by the corniculate and cuneiform cartilages can be recognized.

Laryngeal Mirror and Laryngoscope

- Within the larynx, the vestibular folds and the vocal folds can be seen.
- The vestibular folds are fixed, widely separated, and reddish in color
- The vocal folds move with respiration and are white in color.
- With quiet breathing, the rima glottidis is triangular, with the apex in front.
- With deep inspiration, the rima glottidis assumes a diamond shape because of the lateral rotation of the arytenoid cartilages.
- If the patient is asked to breathe deeply, the vocal folds become widely abducted, and the inside of the trachea can be seen.

Important Anatomic Axes for Endotracheal Intubation

- The upper airway has three axes that have to be brought into alignment if the glottis is to be viewed adequately through a laryngoscope
- the axis of the mouth,
- the axis of the pharynx,
- the axis of the trachea.

The following procedures are necessary

1. the head is extended at the atlanto-occipital joints. This brings the axis of the mouth into the correct position.
2. the neck is flexed at cervical vertebrae C4 to C7 by elevating the back of the head off the table, often with the help of a pillow. This brings the axes of the pharynx and the trachea in line with the axis of the mouth.

Congenital Anomalies

- Certain congenital laryngotracheal anomalies occur because of problems during embryogenesis. These include laryngeal atresia, laryngeal webs, subglottic stenosis, and laryngotracheal clefts.
- Laryngeal atresia occurs if the endolarynx fails to recanalize. Immediate tracheotomy is required for survival.

Congenital Anomalies

- Laryngeal webs occur when the epithelium partially fails to resorb. A weblike mass may appear at the glottic level, often with significant subglottic extension.
- Subglottic stenosis is a deformity in the development of the normal cricoid cartilage (sixth branchial arch).

Congenital Anomalies

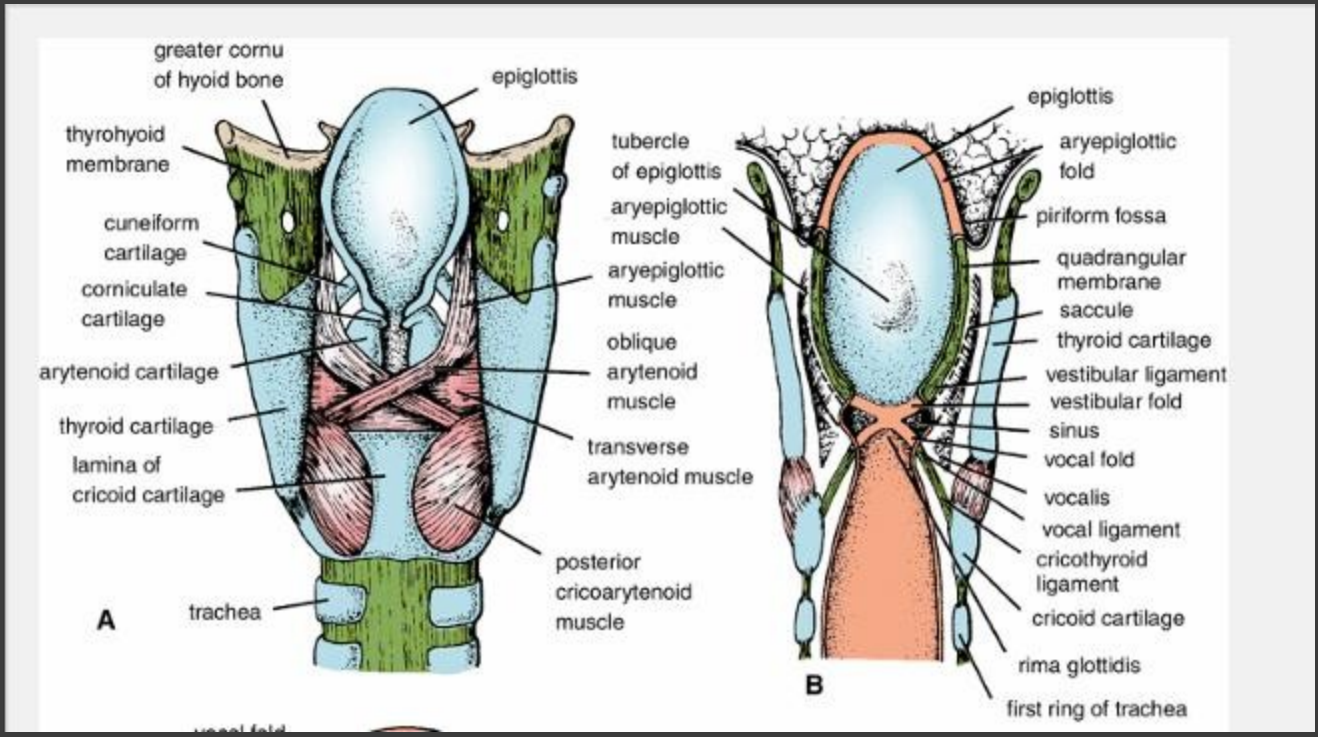
- Laryngotracheal cleft results from a failure to form the tracheoesophageal septum.

Congenital Anomalies

- Immature teratomas of the larynx are very rare. They are composed of multiple tissues foreign to the part of the body in which they arise. Complete surgical excision of the teratoma is advised because of the possibility of malignant degeneration.7

Congenital Anomalies

- Congenital malformations of the larynx are relatively rare but may be life-threatening.
- The most common causes include laryngomalacia, vocal cord paralysis, and subglottic stenosis. ...[S]urgical procedures...include supraglottoplasty for cases of severe laryngomalacia, in which relief of respiratory symptoms has been shown to occur in excess of 80% of cases. Complication rate is low, although postoperative death has been reported. Failure usually occurs in patients with concomitant airway abnormalities including pharyngomalacia. Vocal cord lateralization for vocal cord paralysis with airway compromise is achieved by means of arytenoidopexy or arytenoidectomy, using the lateral approach. Arytenoidectomy also can be performed using laryngofissure or endoscopic laser excision. Subglottic stenosis is the 3rd most common congenital anomaly. Anterior or multiple cricoid splitting with cartilage graft interpositioning is usually performed. The success rates for these procedures has been shown to be approximately 90%.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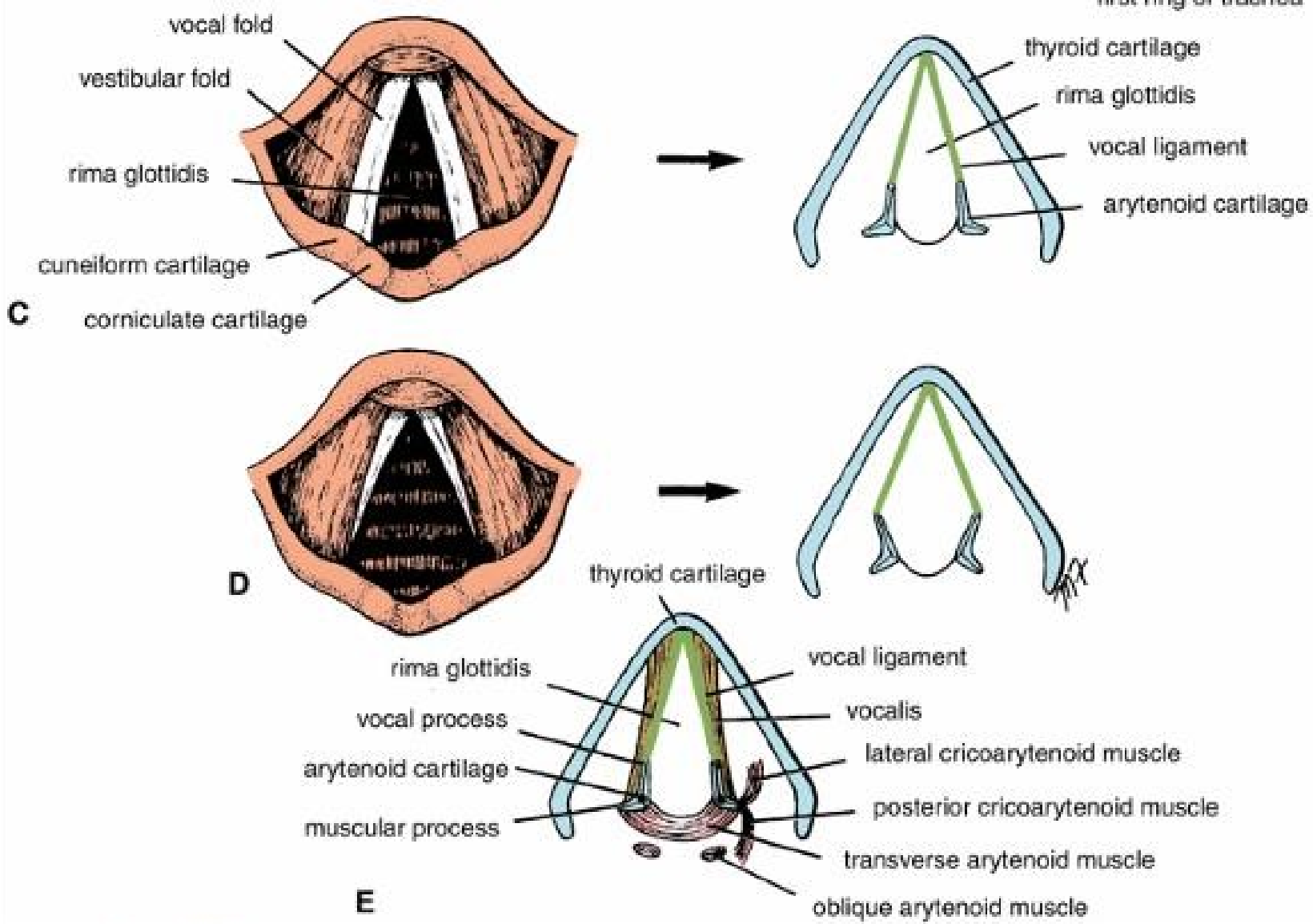
piriform fossa
quadrangular membrane
saccule
thyroid cartilage
vestibular ligament
vestibular fold
sinus
vocal fold
vocalis
vocal ligament
cricothyroid ligament
cricoid cartilage
rima glottidis
first ring of trachea
B


vocal fold
vestibular fold
rima glottidis
cuneiform cartilage
corniculate cartilage
C
thyroid cartilage
rima glottidis
vocal ligament
arytenoid cartilage
D
thyroid cartilage
rima glottidis
vocal process
arytenoid cartilage
muscular process
vocal ligament
vocalis
lateral cricoarytenoid muscle
posterior cricoarytenoid muscle
transverse arytenoid muscle
oblique arytenoid muscle
E

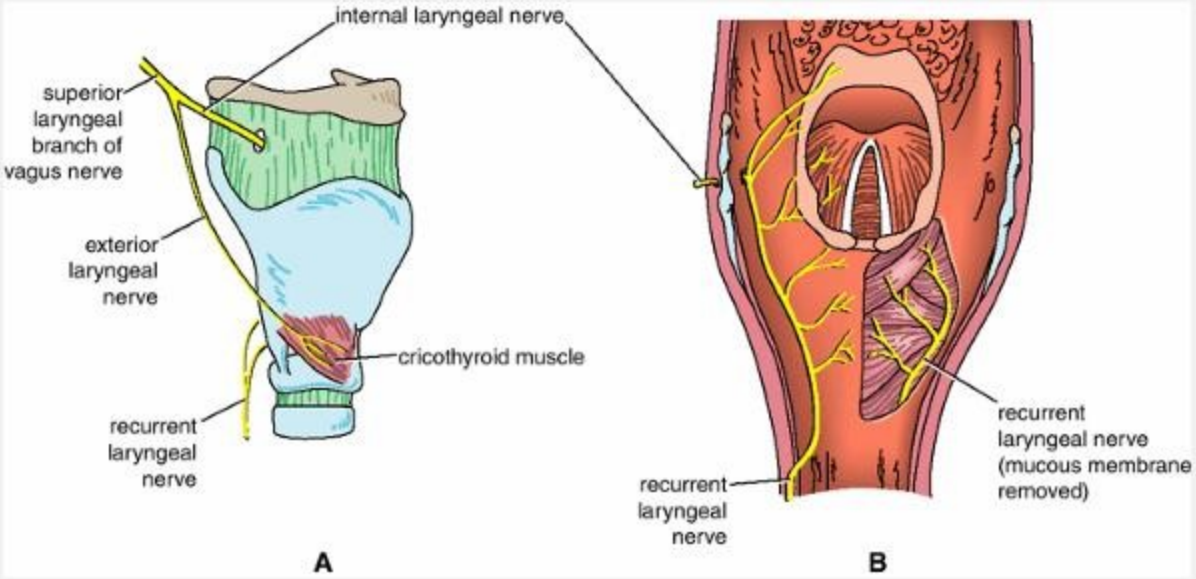
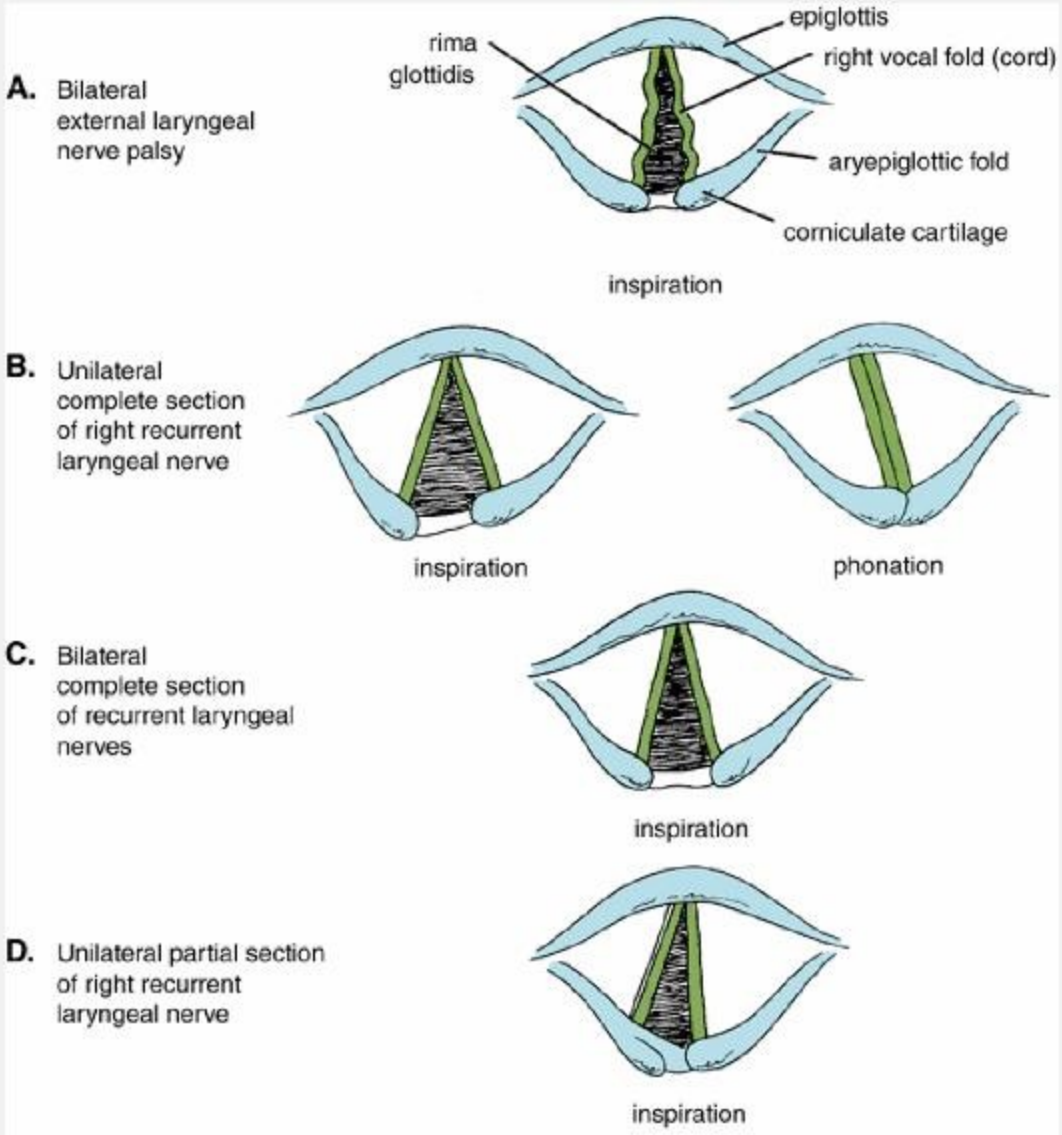


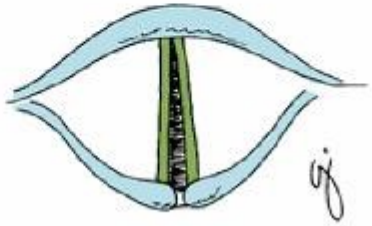
Figure 11-101 A. Lateral view of larynx showing the internal and external laryngeal branches of the superior laryngeal branch of the vagus nerve. **B**. The distribution of the terminal branches of the internal and recurrent laryngeal nerves. The larynx is viewed from above and posteriorly.


A. Bilateral external laryngeal nerve palsy
rima glottidis
epiglottis
right vocal fold (cord)
aryepiglottic fold
corniculate cartilage
inspiration
B. Unilateral complete section of right recurrent laryngeal nerve
inspiration
phonation
C. Bilateral complete section of recurrent laryngeal nerves
inspiration
D. Unilateral partial section of right recurrent laryngeal nerve
inspiration

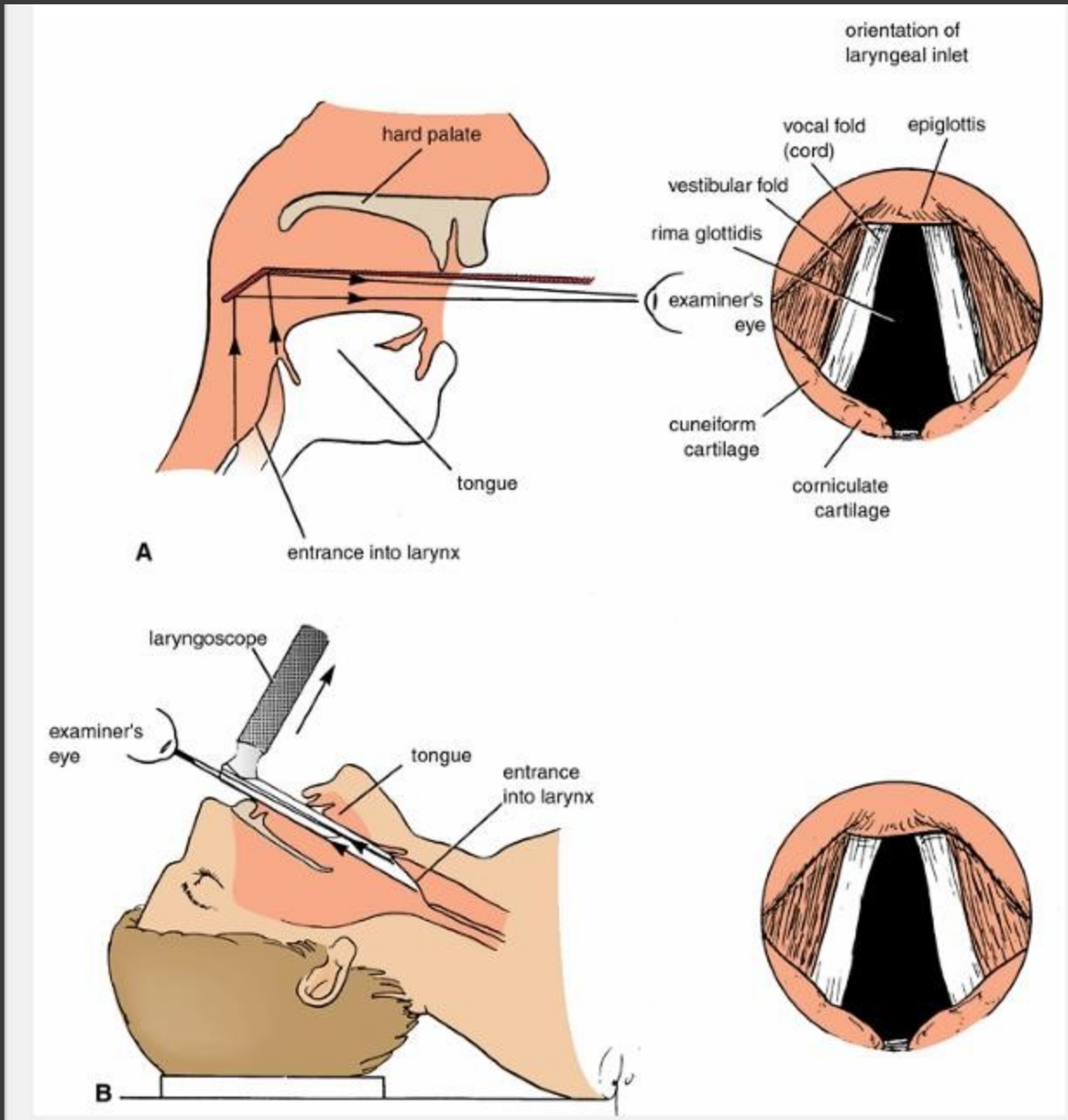
D. Unilateral partial section of right recurrent laryngeal nerve

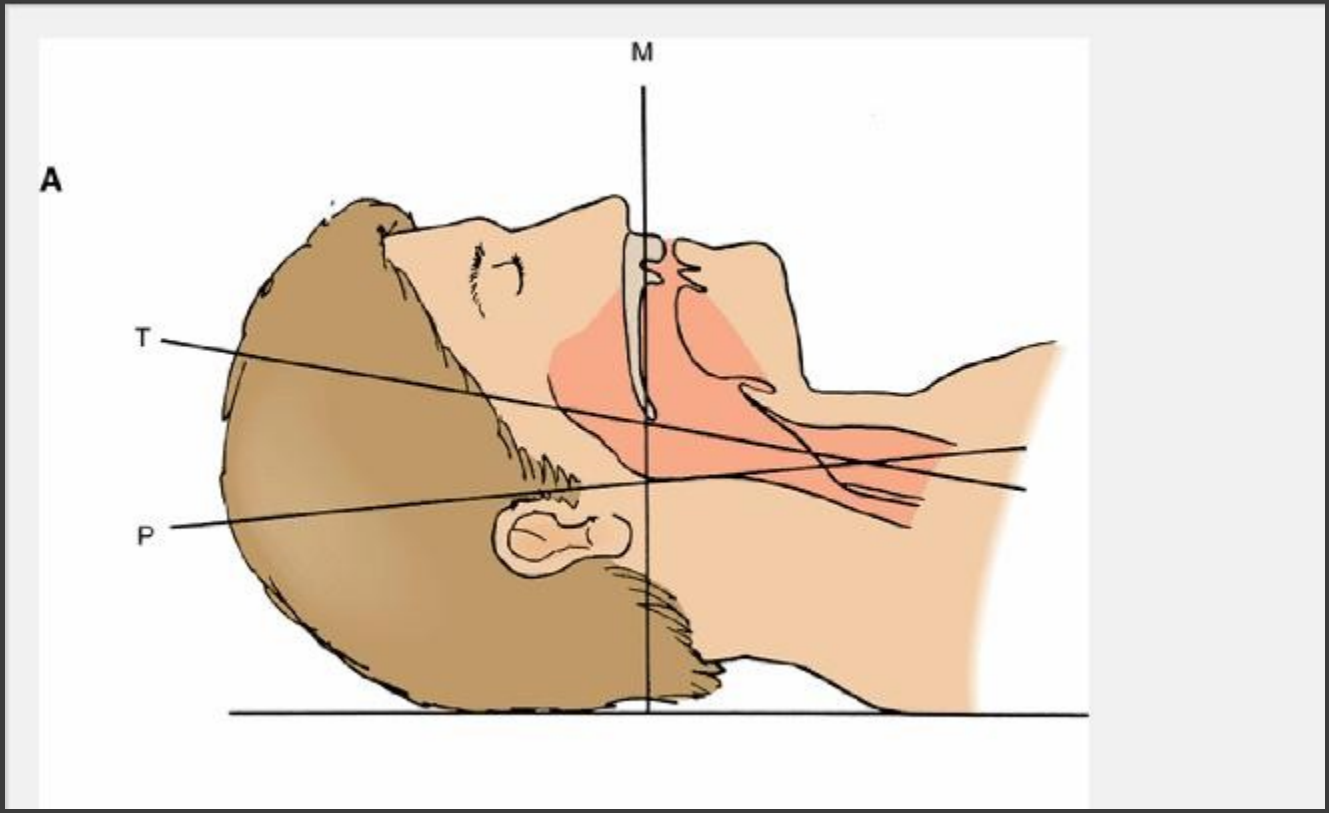
inspiration

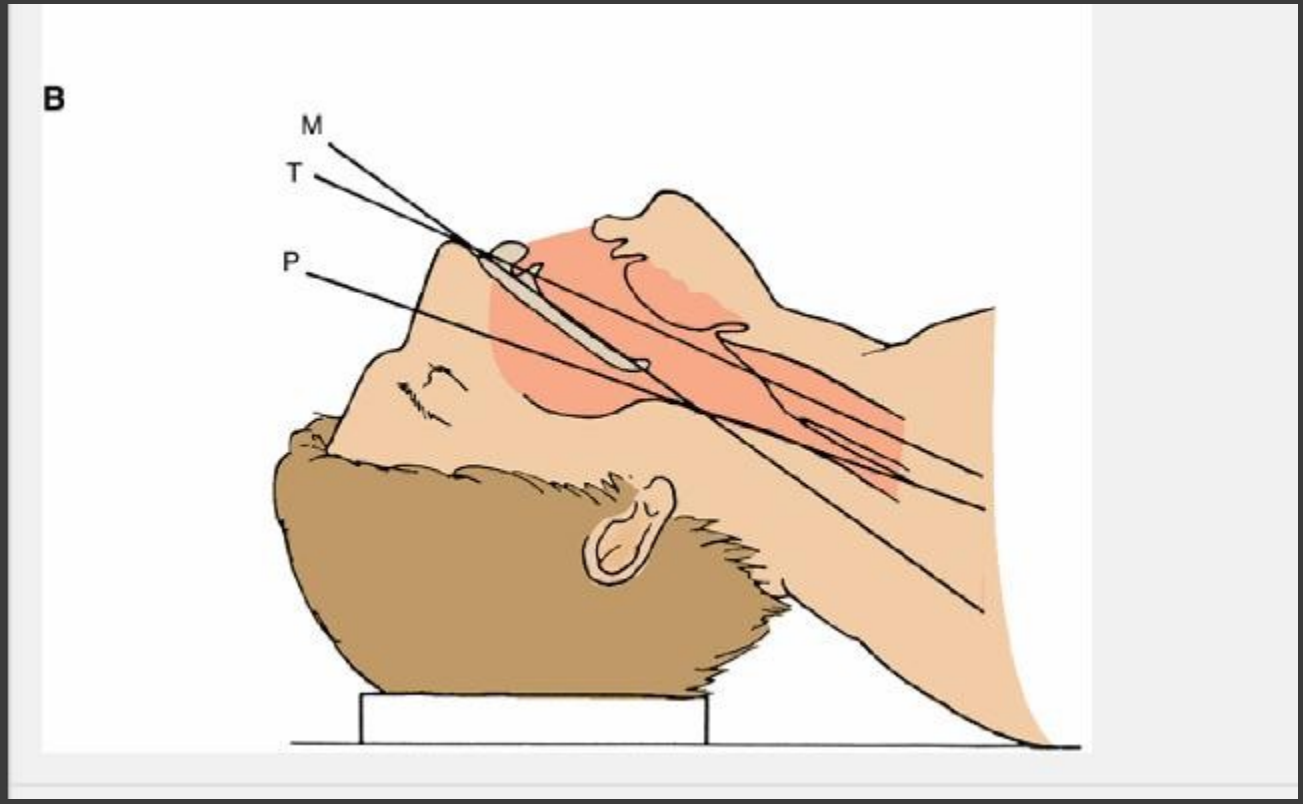
E. Bilateral partial section of recurrent laryngeal nerves

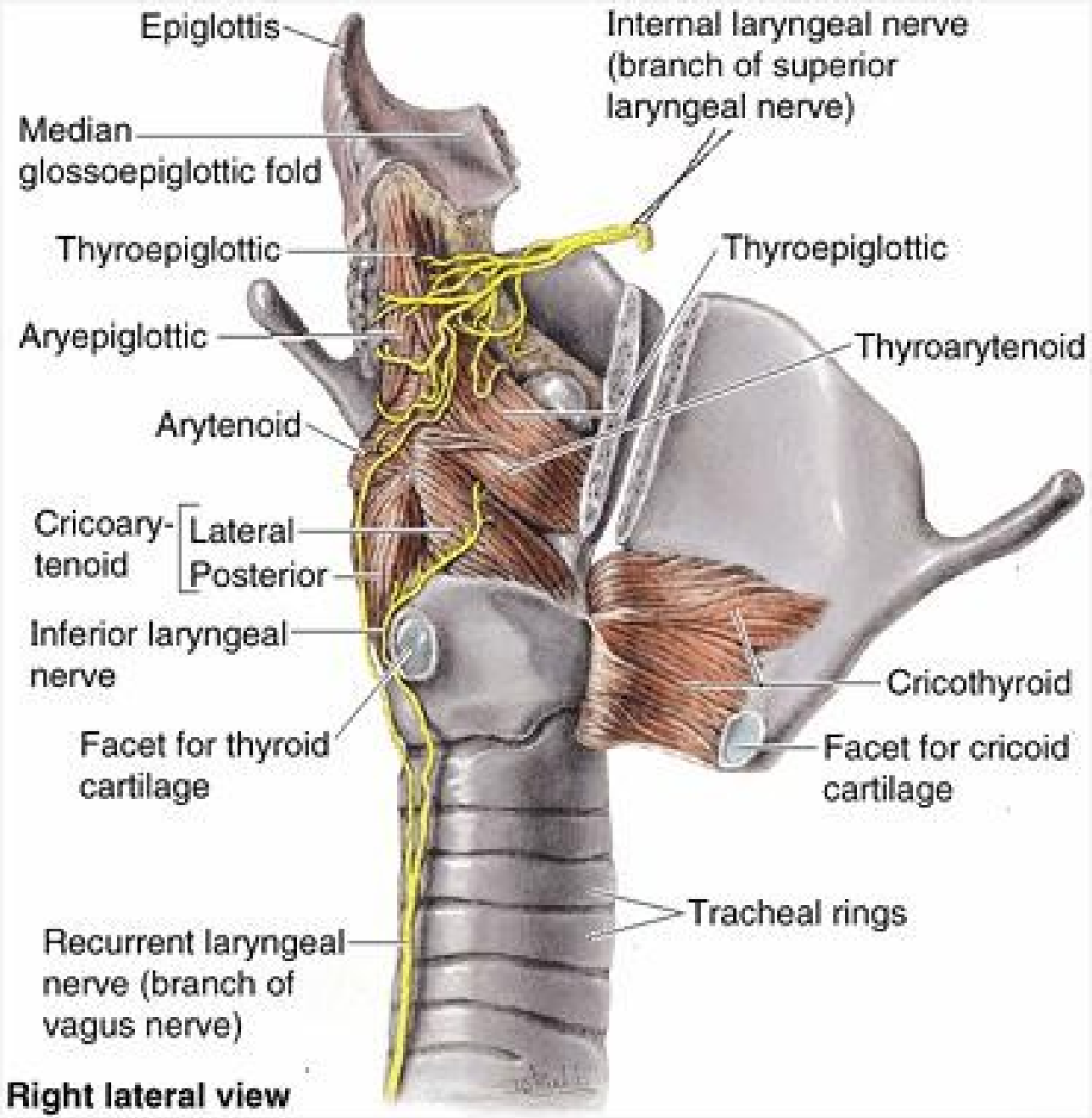


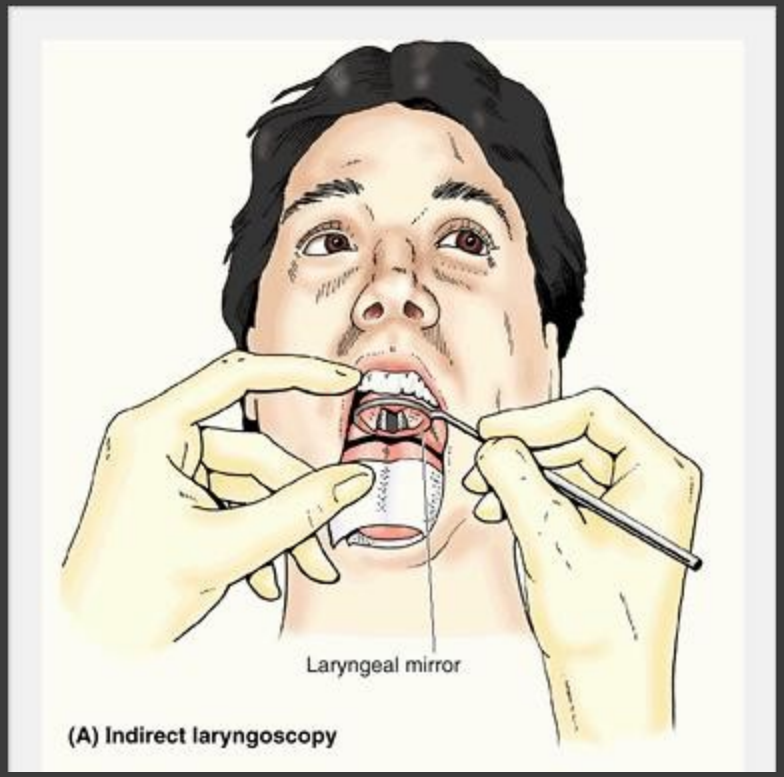
inspiration


orientation of laryngeal inlet
hard palate
vocal fold (cord)
epiglottis
vestibular fold
rima glottidis
examiner's eye
cuneiform cartilage
corniculate cartilage
tongue
entrance into larynx
A
laryngoscope
examiner's eye
tongue
entrance into larynx
B


A
M
T
P

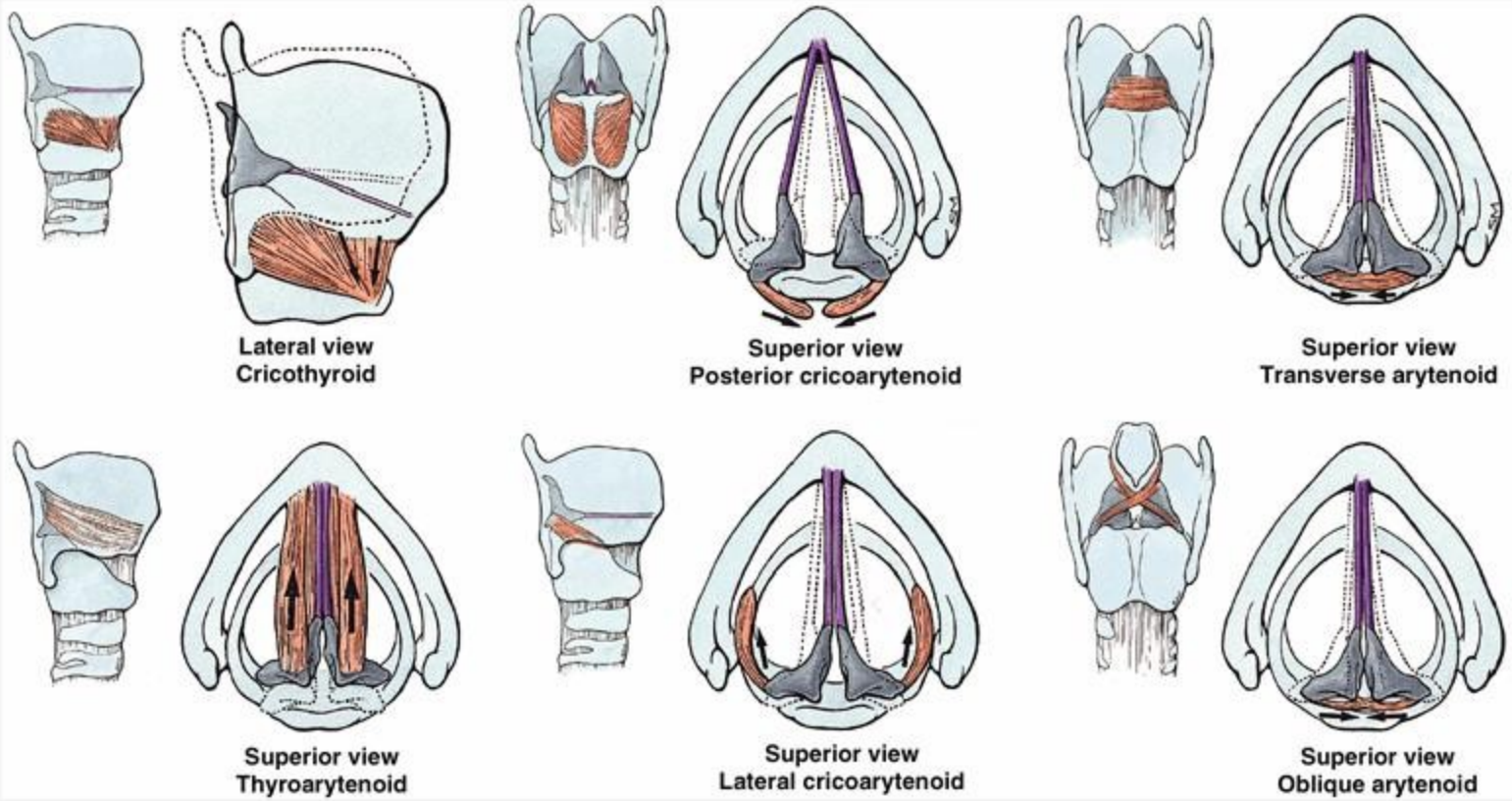

B
M
T
P

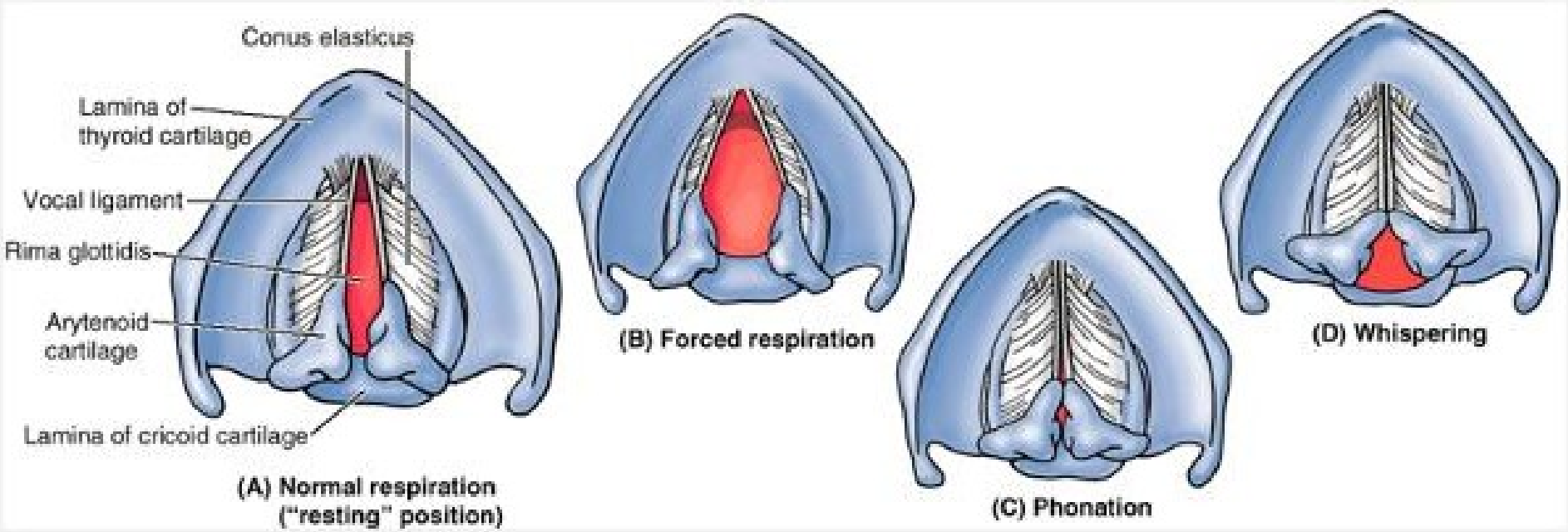

Epiglottis
Internal laryngeal nerve (branch of superior laryngeal nerve)
Median glossoepiglottic fold
Thyroepiglottic
Thyroepiglottic
Aryepiglottic
Thyroarytenoid
Arytenoid
Cricoary-tenoid
Lateral
Posterior
Inferior laryngeal nerve
Cricothyroid
Facet for thyroid cartilage
Facet for cricoid cartilage
Tracheal rings
Recurrent laryngeal nerve (branch of vagus nerve)
Right lateral view

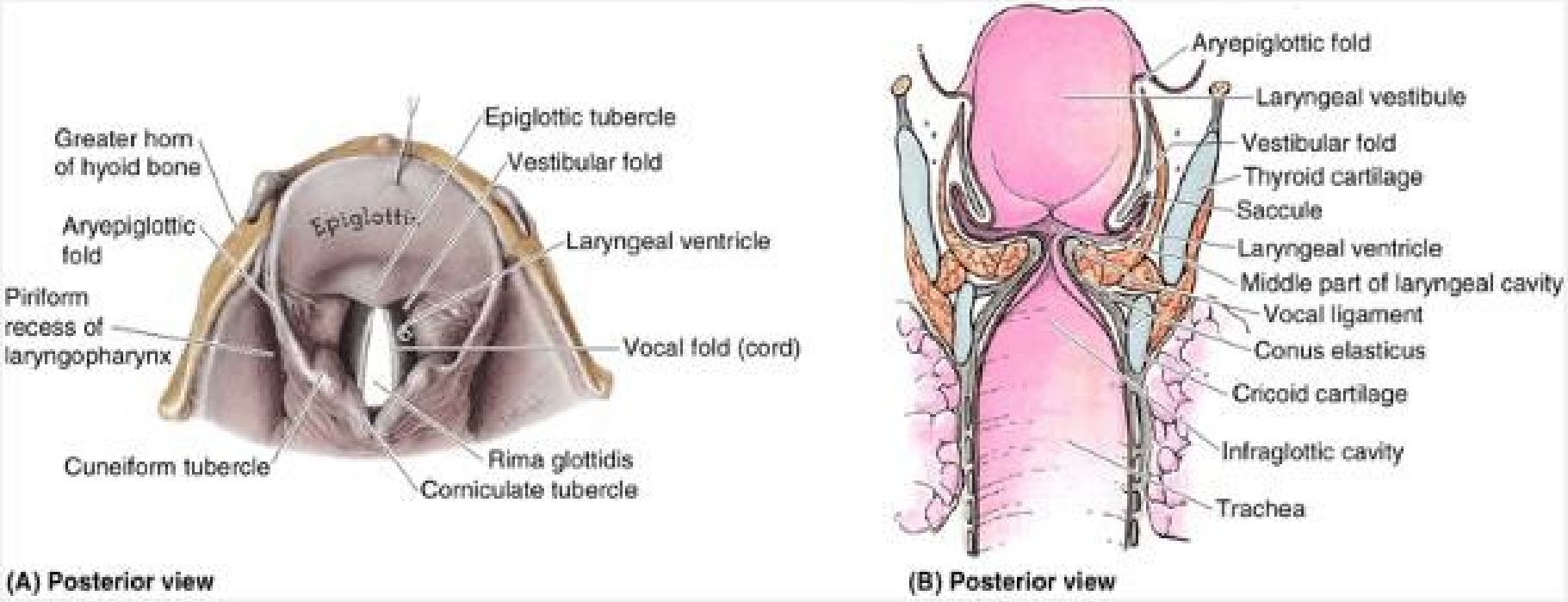


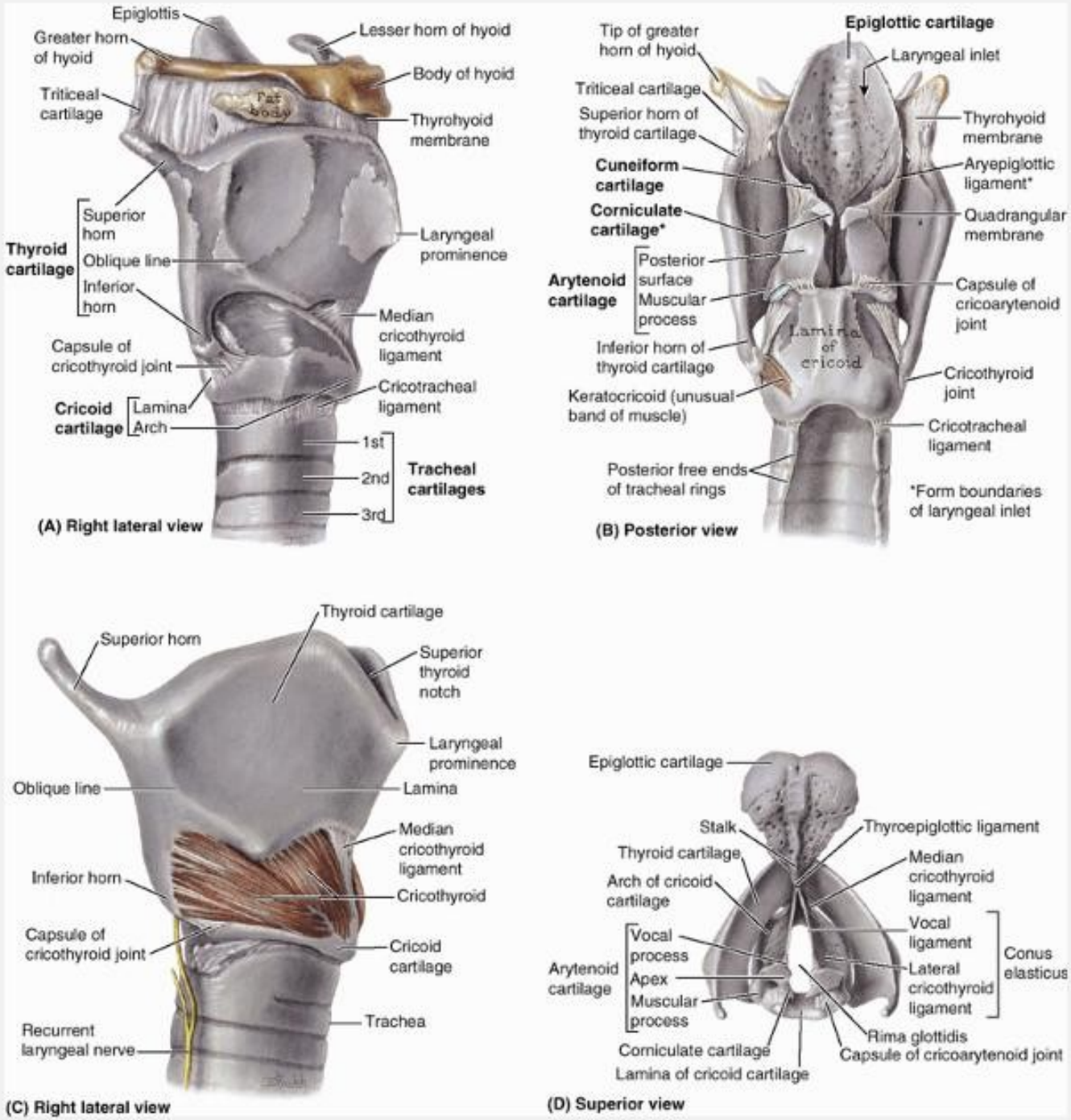
(A) Indirect laryngoscopy

Table 8.5. Muscles of the Larynx




Conus elasticus
Lamina of thyroid cartilage
Vocal ligament
Rima glottidis
Arytenoid cartilage
Lamina of cricoid cartilage
(A) Normal respiration ("resting" position)
(B) Forced respiration
(C) Phonation
(D) Whispering


Greater horn of hyoid bone
Aryepiglottic fold
Piriform recess of laryngopharynx
Cuneiform tubercle
Epiglottic tubercle
Vestibular fold
Laryngeal ventricle
Vocal fold (cord)
Rima glottidis
Corniculate tubercle
(A) Posterior view
Aryepiglottic fold
Laryngeal vestibule
Vestibular fold
Thyroid cartilage
Saccule
Laryngeal ventricle
Middle part of laryngeal cavity
Vocal ligament
Conus elasticus
Cricoid cartilage
Infraglottic cavity
Trachea
(B) Posterior view


Epiglottis
Greater horn of hyoid
Lesser horn of hyoid
Body of hyoid
Triticeal cartilage
Fat body
Thyrohyoid membrane
Thyroid cartilage
Superior horn
Oblique line
Inferior horn
Laryngeal prominence
Median cricothyroid ligament
Capsule of cricothyroid joint
Cricotracheal ligament
Cricoid cartilage
Lamina
Arch
1st
2nd
3rd
Tracheal cartilages
(A) Right lateral view
Tip of greater horn of hyoid
Epiglottic cartilage
Laryngeal inlet
Triticeal cartilage
Superior horn of thyroid cartilage
Thyrohyoid membrane
Cuneiform cartilage
Aryepiglottic ligament*
Corniculate cartilage*
Quadrangular membrane
Arytenoid cartilage
Posterior surface
Muscular process
Capsule of cricoarytenoid joint
Lamina of cricoid
Inferior horn of thyroid cartilage
Cricothyroid joint
Keratocricoid (unusual band of muscle)
Cricotracheal ligament
Posterior free ends of tracheal rings
*Form boundaries of laryngeal inlet
(B) Posterior view
Thyroid cartilage
Superior horn
Superior thyroid notch
Laryngeal prominence
Oblique line
Lamina
Median cricothyroid ligament
Inferior horn
Cricothyroid
Capsule of cricothyroid joint
Cricoid cartilage
Trachea
Recurrent laryngeal nerve
(C) Right lateral view
Epiglottic cartilage
Stalk
Thyroepiglottic ligament
Thyroid cartilage
Median cricothyroid ligament
Arch of cricoid cartilage
Vocal ligament
Vocal process
Apex
Muscular process
Arytenoid cartilage
Lateral cricothyroid ligament
Conus elasticus
Rima glottidis
Corniculate cartilage
Capsule of cricoarytenoid joint
Lamina of cricoid cartilage
(D) Superior view