ORAL CAVITY, PHARYNX & LARYNX

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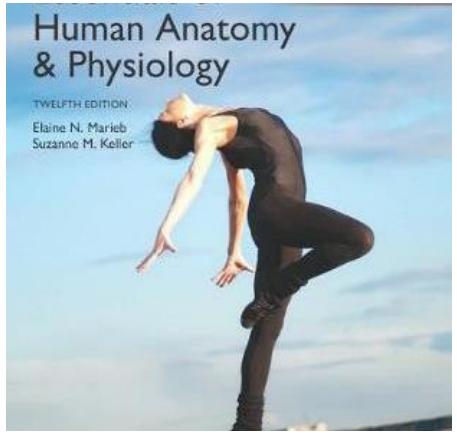
Resources



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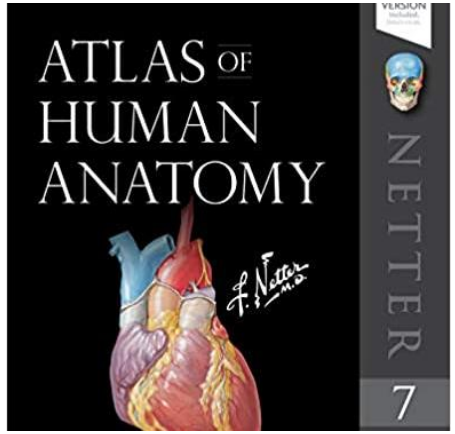

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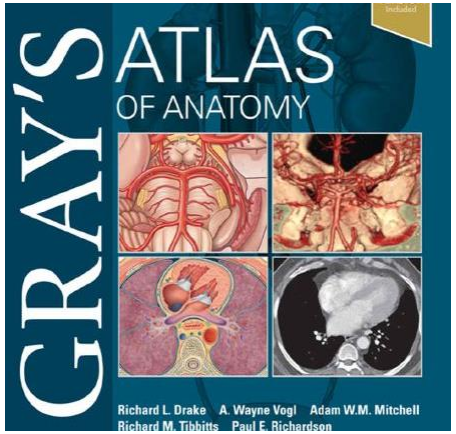

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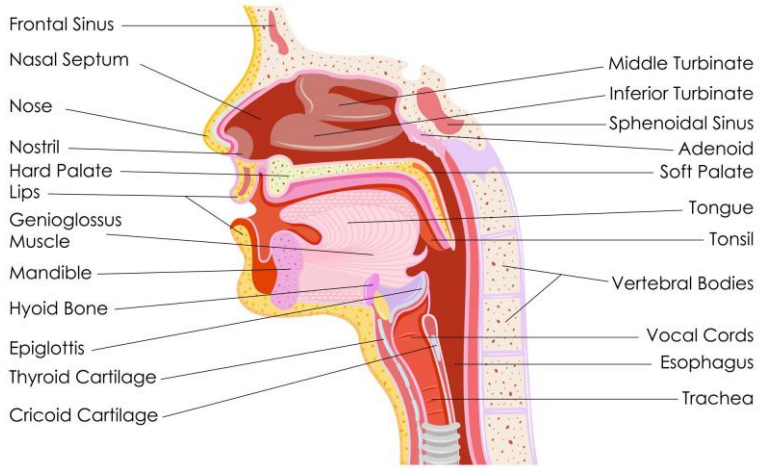
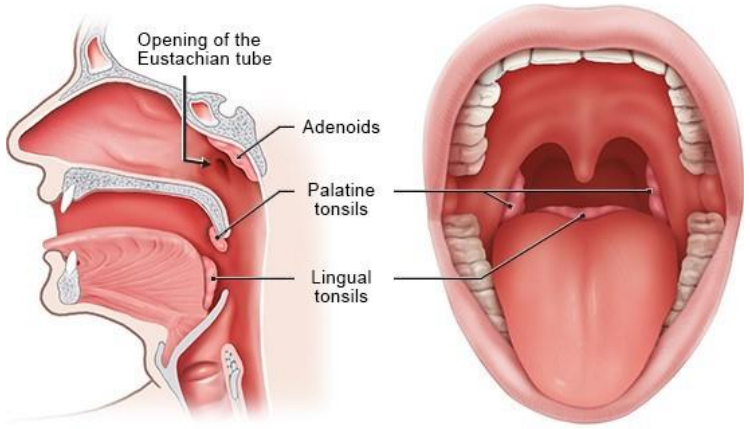
ORAL CAVITY

ORAL CAVITY

- It is the first part of alimentary tract.
- It lies in the head, bordered by lips anteriorly, cheeks laterally and oropharynx posteriorly.
- It is divided into two parts:
    - **Vestibule of the mouth**: a narrow slit lies between lips and cheeks externally and the teeth and gums internally.
    - **The oral cavity proper** (buccal cavity): forming the rest of mouth cavity, containing mainly the tongue.
- The roof of the palate is formed by nasal cavity.
- The ducts of salivary gland open into the mouth cavity.





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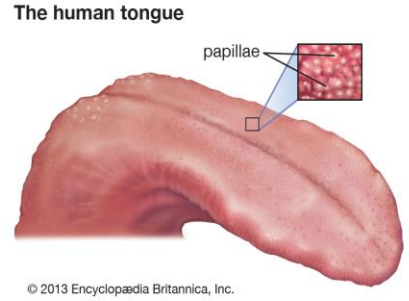
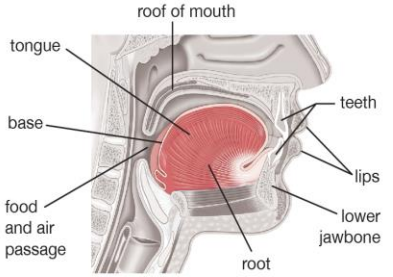
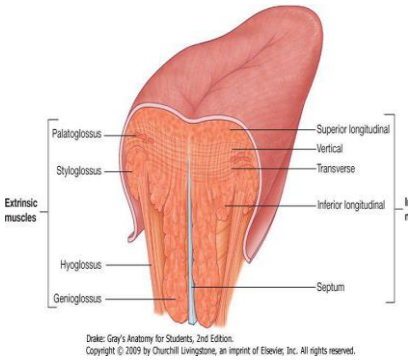
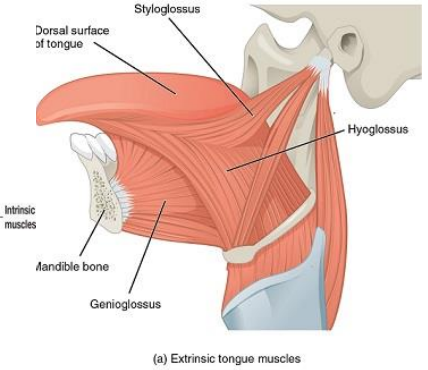
THE TONGUE

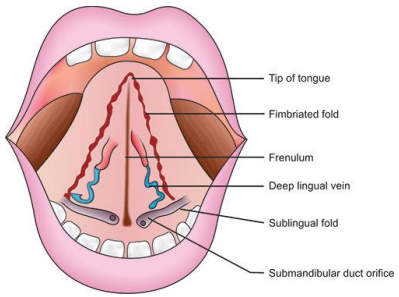
- It is a muscular tissue located in the floor of oral cavity responsible for speech, taste, mastication and deglutition.
- There are two types of muscles: intrinsic muscles covered by specific mucous membrane and extrinsic muscles connecting the tongue to the surrounding bones.
- It has a root, tip and body.
    - The **root** is considered the posterior part, and it is connected to mandible.
    - The **tip** is the anterior free part.
    - The **body** is its main bulk, and it has dorsal and ventral surfaces.
        - **Dorsal surface**: is rough and characterized by different projections called lingual papillae with taste buds responsible for taste sensation.
        - **Ventral surface**: is smooth showing median elevation celled lingual frenulum.





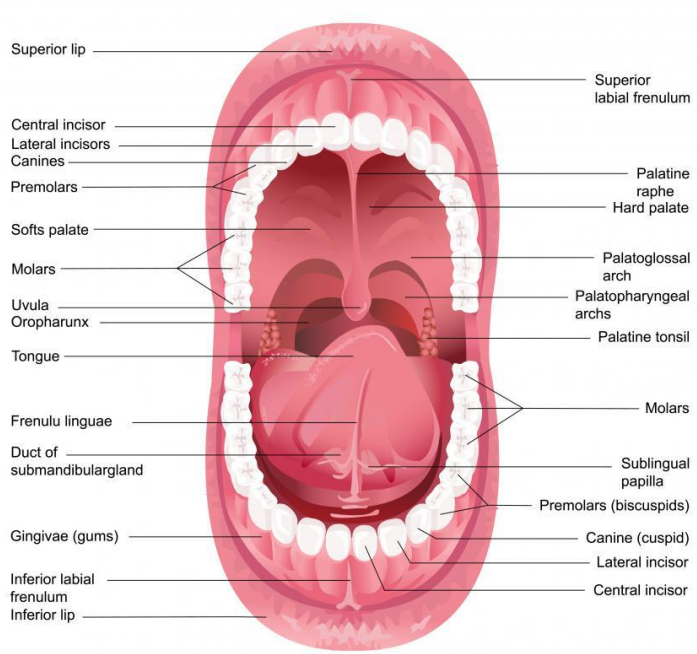






TEETH AND GUMS

- The teeth play essential role in mastication and chewing the food by opening and closing the jaws and moving food from side to side.
- The upper and lower jaws are formed of bony arch containing sockets for teeth.
- The roots of these teeth are covered by mucosa called the gingivae (gums).
- The teeth performs different functions as cutting, tearing, crushing and grinding.



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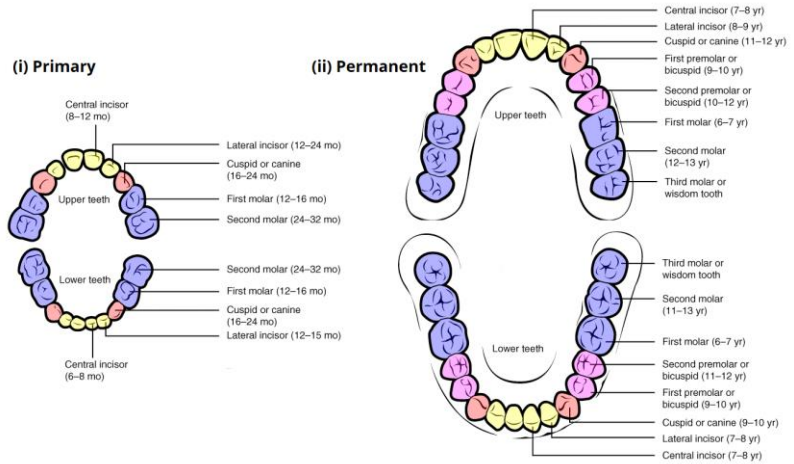
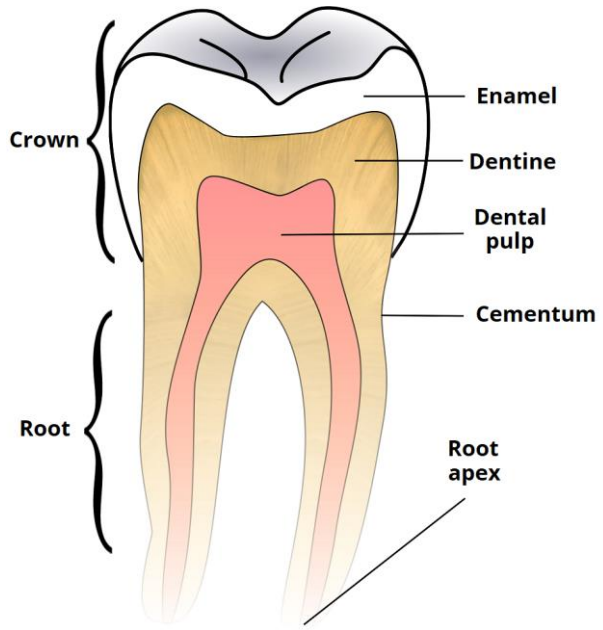
TEETH AND GUMS

- By the age of 21, the two sets of teeth shall be formed.
- The first set are primary teeth or temporary teeth or baby teeth or milky teeth, which has a full set of 20 teeth by the age of 2 years.
- The second set are permanent teeth, which is erupted by the end of teenage, and have a set of 32 permanent teeth.
- The third molars, also called wisdom teeth, emerge between the ages of 17 and 25.
- Teeth are organized into two opposing arches:
    - Maxillary (upper)
    - Mandibular (lower)



STRUCTURE

- A tooth can be divided into two main parts, the **crown** and the **root**.
- The part of a tooth which is visible in the mouth is referred to as the **clinical crown**, while the part which is not visible is, by definition, the **clinical root**.
- Generally, the anatomic crown is covered by **enamel**, while the anatomic root is covered by **cementum**:
- **Enamel** is a solid, avascular hard tissue with a high mineral content.
- It is, in effect, designed to provide thermal insulation for a tooth, and to protect the internal vital tissues from destruction.
- Enamel is potential to dental caries, tooth wear and acid dissolution.
- **Cementum** is a softer, more sensitive tissue.
- It becomes visible if a tooth is extruded from the alveolar socket during a traumatic dental injury, and when periodontal disease (disease of the tooth supporting tissues) causes root exposure; a person becomes "long in the tooth".



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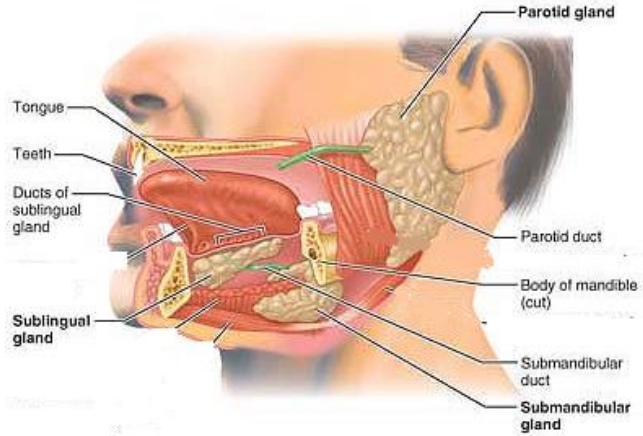
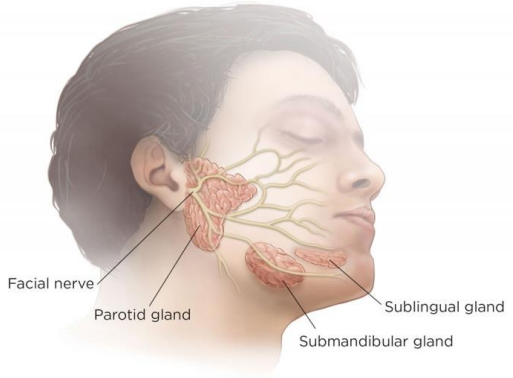
SALIVARY GLANDS

- There are two types of salivary glands:
    - Minor glands, scattered in the oral cavity.
    - Major salivary glands:
- **Parotid glands**: They are the largest salivary glands; lie in front of the ear. Its duct opens in the vestibule of the oral cavity.
- **Submandibular glands**: in the floor of mouth under the angle of the lower jaw. Its duct opens in buccal part of the oral cavity.
- **Sublingual glands**: in the floor of mouth below the tongue. Its duct opens in buccal part of the oral cavity.

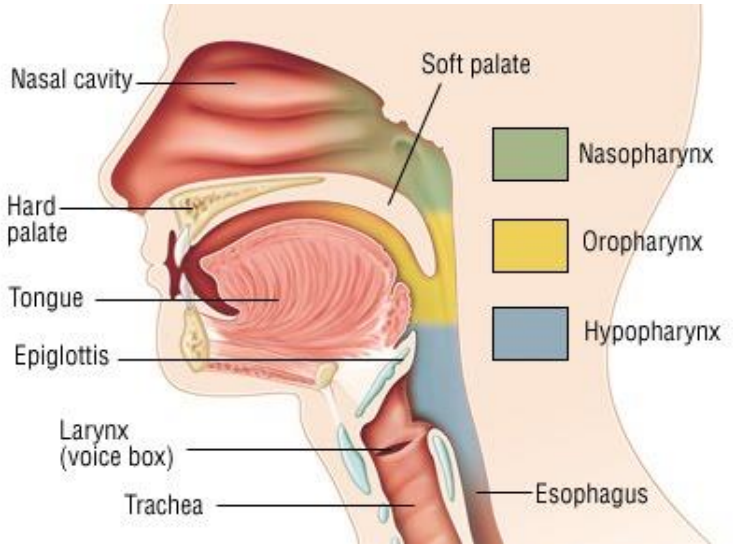




PHARYNX

INTRODUCTIONS

- The pharynx is the part of the throat that lies directly behind the mouth.
- It is a muscular tube that connects the nasal and oral cavities to the larynx and esophagus.
- It is common to gastrointestinal and respiratory tracts.
- It begins at the base of the skull and ends inferiorly to the cricoid cartilage at C6.
- It is divided into three parts known as the nasopharynx, oropharynx and laryngopharynx.
- Its muscular wall formed of two layers:
    - **Inner longitudinal**
    - **Outer Circular**



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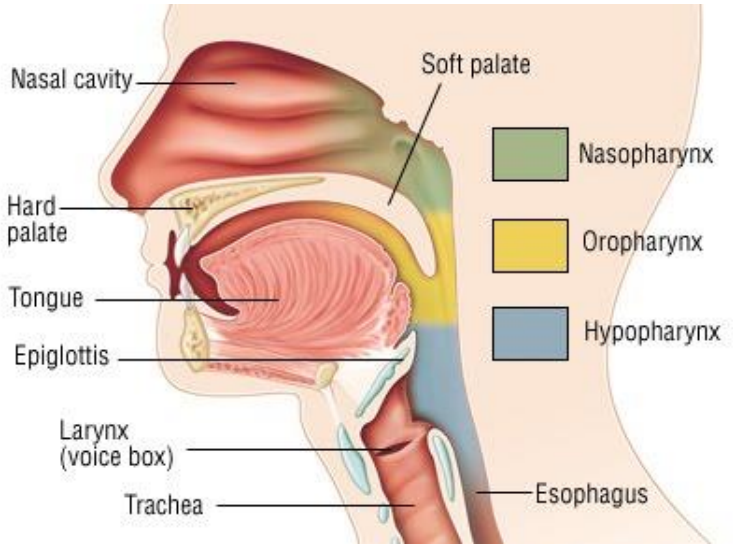
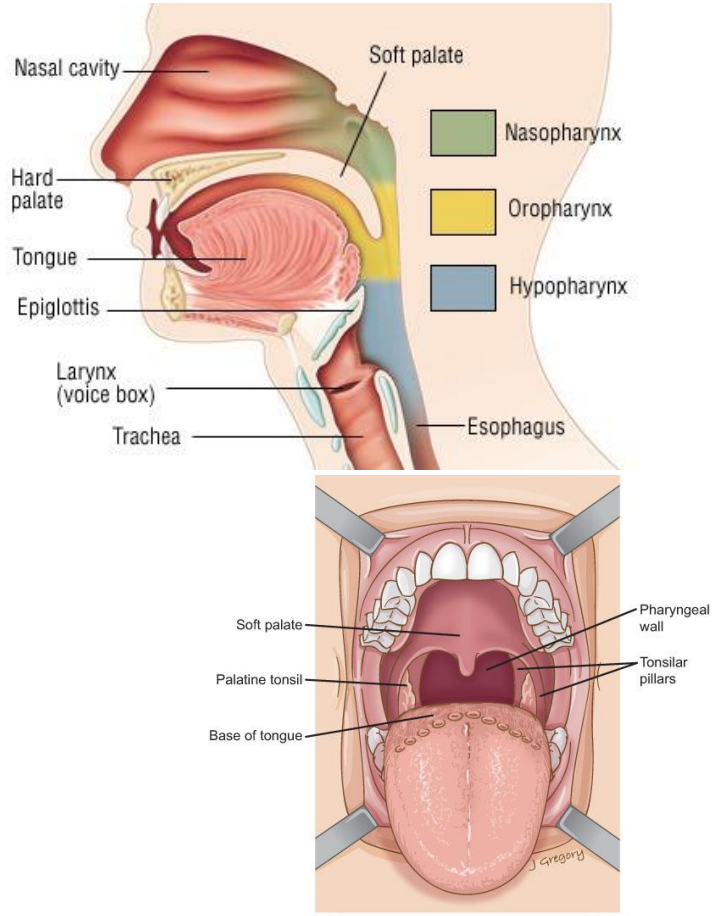
NASOPHARYNX

- It extends from the base of the skull to the upper surface of the soft palate.
- The anterior aspect of the nasopharynx communicates with the nasal cavities through the choanae.
- This part of the pharynx is lined with respiratory epithelium: ciliated pseudo-stratified columnar epithelium with goblet cells.
- It performs a respiratory function by conditioning inspired air and propagating it to the larynx.



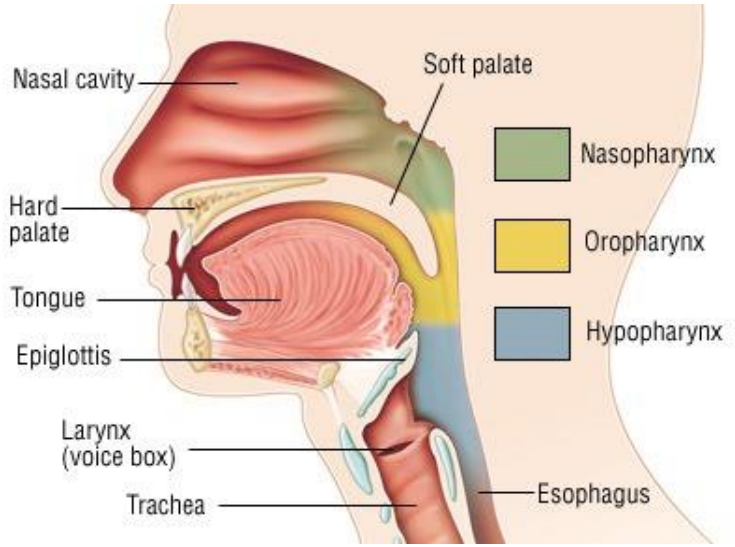
OROPHARYNX

- It is the middle part of the pharynx, located between the soft palate and the superior border of the epiglottis.
- It lies behind the oral cavity, extending from the uvula to the level of the hyoid bone.
- It contains the following structures:
    - Posterior 1/3 of the tongue.
    - The lingual tonsils – Located inferiorly to the tongue.
    - The palatine tonsils
    - Superior constrictor muscle
- It is involved in the voluntary and involuntary phases of swallowing.
- Because both food and air pass through the pharynx, a flap of connective tissue called the epiglottis closes over the glottis when food is swallowed to prevent aspiration.



LARYNGOPHARYNX

- The most distal part of the pharynx, located between the superior border of the epiglottis and inferior border of the cricoid cartilage (C6).
- It is found posterior to the larynx and communicates with it via laryngeal inlet.
- It is the part of the throat that is connected to the esophagus.
- It lies inferior to the epiglottis and extends to the location where this common pathway into the respiratory (larynx) and digestive (esophagus) pathways.
- At that point, the laryngopharynx is continuous with the esophagus posteriorly where it conducts food and fluids to the stomach.
- The laryngopharynx contains the middle and inferior pharyngeal constrictors.



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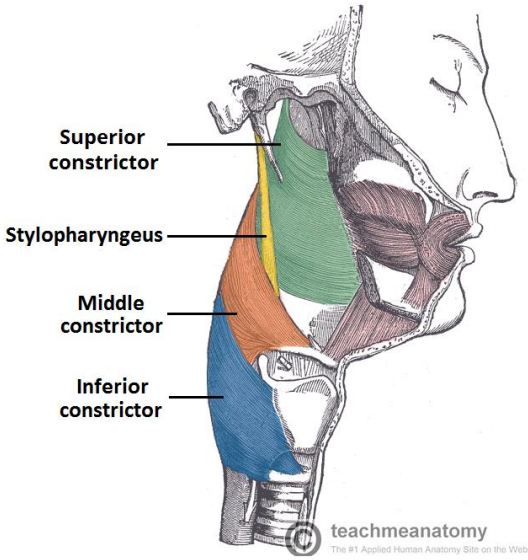
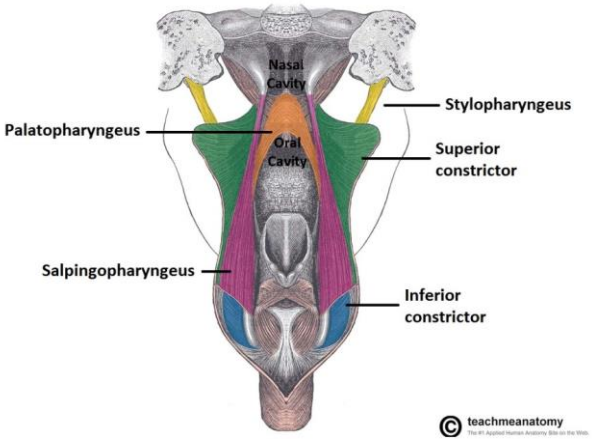
MUSCLES

- There are two types of muscles that form the walls of the pharynx; longitudinal and circular.
- The circular muscles contract sequentially from superior to inferior to constrict the lumen and propel the bolus of food inferiorly into the esophagus.
    - Superior pharyngeal muscles constrictor is found in the oropharynx.
    - Middle pharyngeal muscles constrictor is found in the laryngopharynx.
    - Inferior pharyngeal muscles constrictor is found in the laryngopharynx.
- The longitudinal muscles shorten and widen the pharynx and elevate the larynx during swallowing.
- In addition to contributing to swallowing, it also opens the Eustachian tube to equalize the pressure in the middle ear with the atmosphere.





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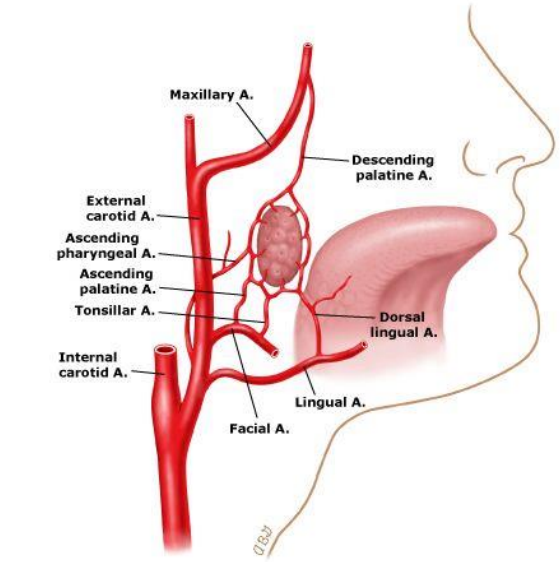
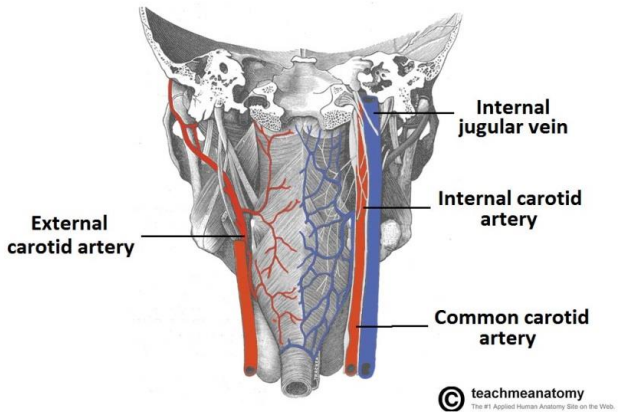
BLOOD SUPPLY

- **Arterial Blood Supply**
- The pharynx is supplied by branches of the external carotid artery:
  - Ascending pharyngeal artery
  - Lingual artery
  - Facial artery
  - Maxillary artery
- **Venous Blood Drainage**
- The pharynx is drained by the pharyngeal venous plexus, which drains into the internal jugular vein.





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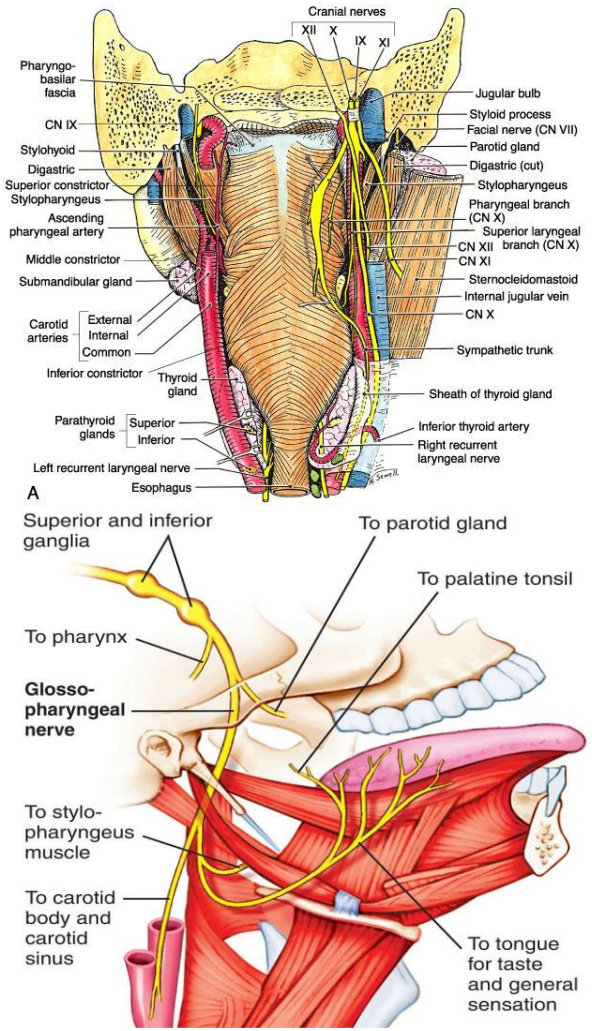
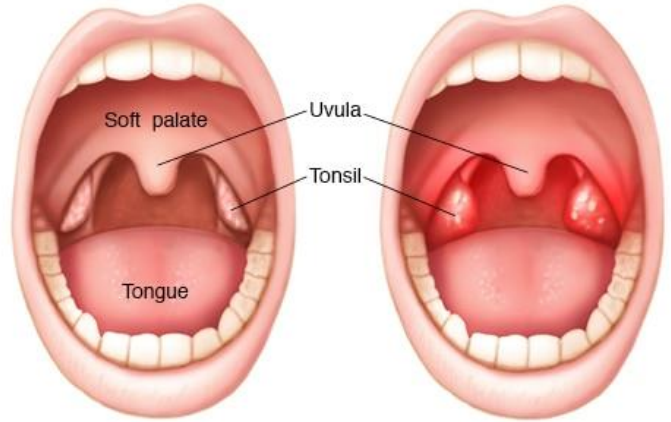
INNERVATION

- Each of the three sections of the pharynx have a different sensory innervation:
  - Branches of the glossopharyngeal nerve (CN IX).
  - Branches of the vagus nerve (CN X).
  - Sympathetic fibers of the superior cervical ganglion.
- All the muscles of the pharynx are innervated by the vagus nerve except for the stylopharyngeus, which is innervated by the glossopharyngeal nerve.



TONSILLITIS

- The palatine tonsils can become inflamed due to a viral or bacterial infection.
- Usually, they appear red and enlarged.
- Chronic infection of the palatine tonsils can be treated with their removal (tonsillectomy).
- When performing a tonsillectomy, there may be bleeding primarily from the external palatine vein and secondarily from the tonsillar branch of the facial artery.
- If an infection spreads to the peritonsillar tissue, it can cause abscess formation.



LARYNX

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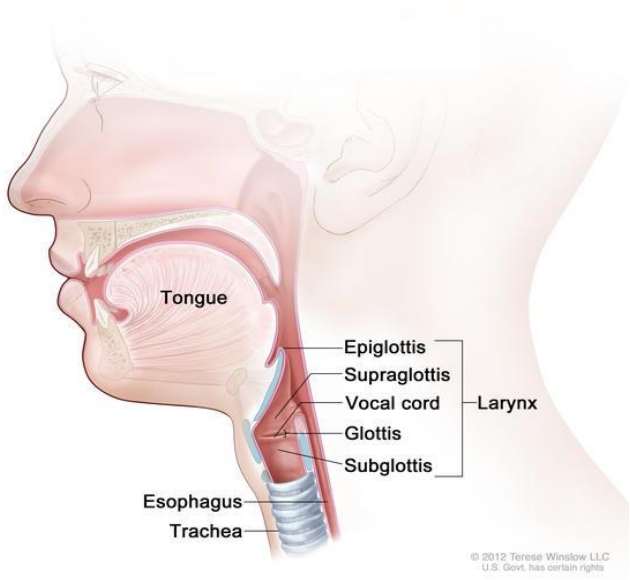
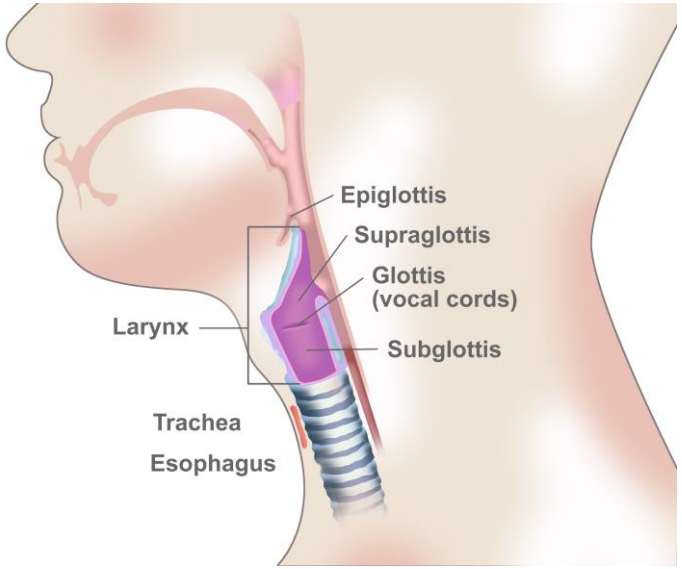
INTRODUCTION

- Specialized organ at the inlet of air passage.
- It is an organ located in the anterior neck.
- The structure of the larynx is primarily cartilaginous and is held together by a series of ligaments and membranes.
- Internally, the laryngeal muscles move components of the larynx for phonation and breathing.
- Superiorly, attached to hyoid bone.
- Inferiorly, continues with trachea.



FUNCTIONS

- Protective sphincter at the air passage.
- Phonation.
- Regulates air passage in inspiration and expiration.
- Opens and closes during swallowing, coughing and sneezing.



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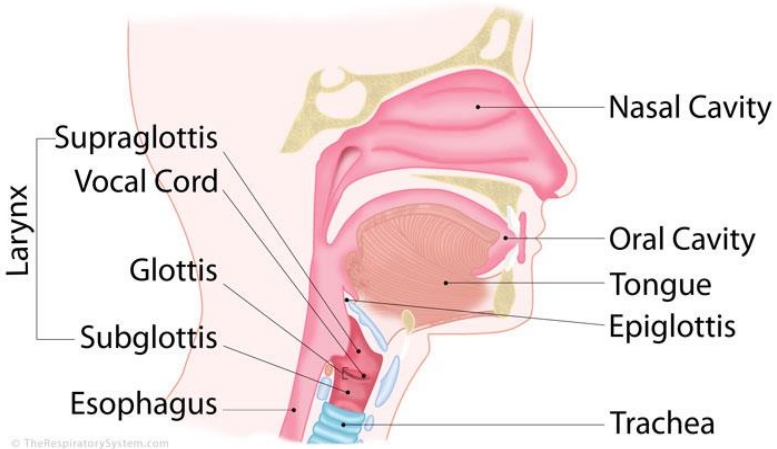
STRUCTURES

- The larynx is formed by a cartilaginous skeleton, which is held together by ligaments and membranes.
- The laryngeal muscles act to move the components of the larynx for phonation and breathing.
- The internal cavity of the larynx can be divided into three sections:
  - **Supraglottis:** From the inferior surface of the epiglottis to the vestibular folds (false vocal cords).
  - **Glottis:** Contains vocal cords and 1cm below them.
  - **Subglottis:** From inferior border of the glottis to the inferior border of the cricoid cartilage.



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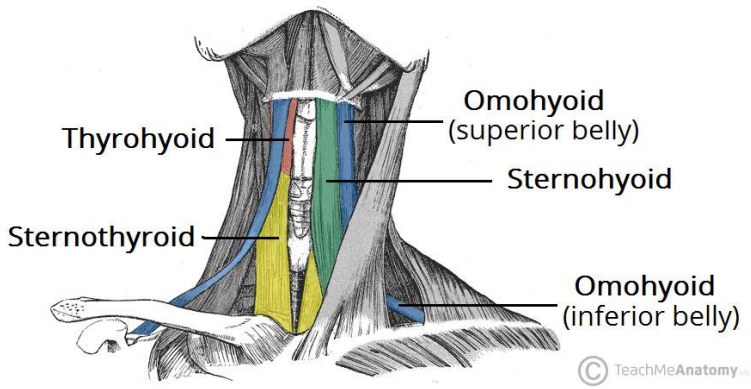
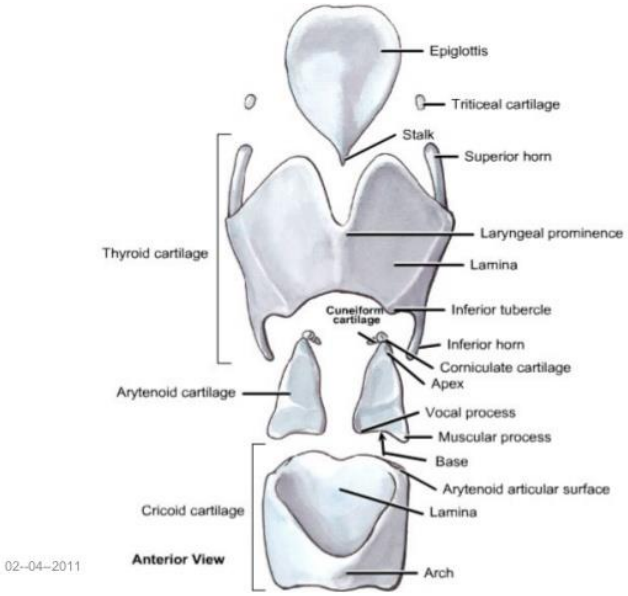
POSITION AND RELATION

- The larynx is located in the anterior compartment of the neck, suspended from the hyoid bone and spanning between C3 and C6.
- It is continuous inferiorly with the trachea and opens superiorly into the laryngeal part of the pharynx.
- It is covered anteriorly by the infrahyoid muscles (sternohyoid, sternothyroid, thyrohyoid and omohyoid muscles), and laterally by the lobes of the thyroid gland. Posteriorly, the oesophagus is located.
- The larynx is also closely related to the major blood vessels of neck, which laterally as they ascend to the head.



CARTILAGES

- **Unpaired (Single) Cartilages**
  - Epiglottis
  - Thyroid cartilage
  - Cricoid
- **Paired Cartilages**
  - Arytenoid
  - Corniculate
  - Cuneiform
- **All** cartilages are hyaline **except** the epiglottis which is elastic cartilage.



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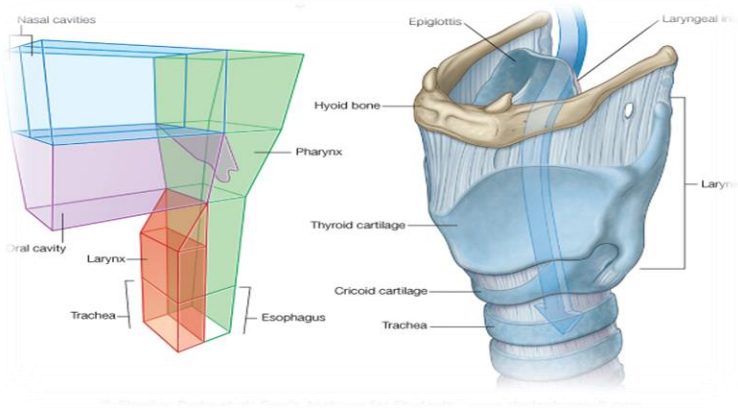
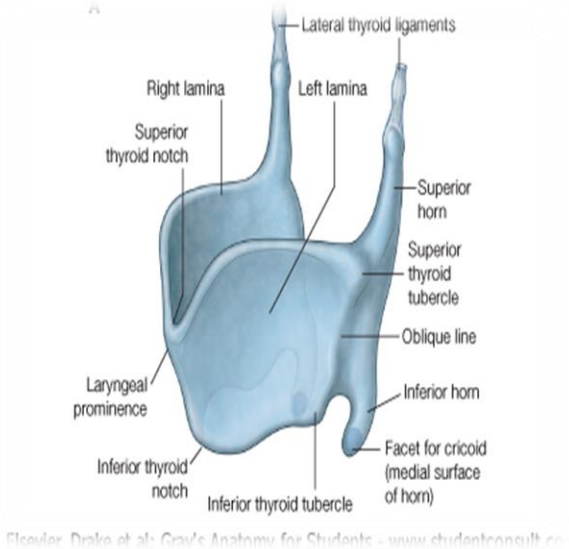
FRAMEWORK

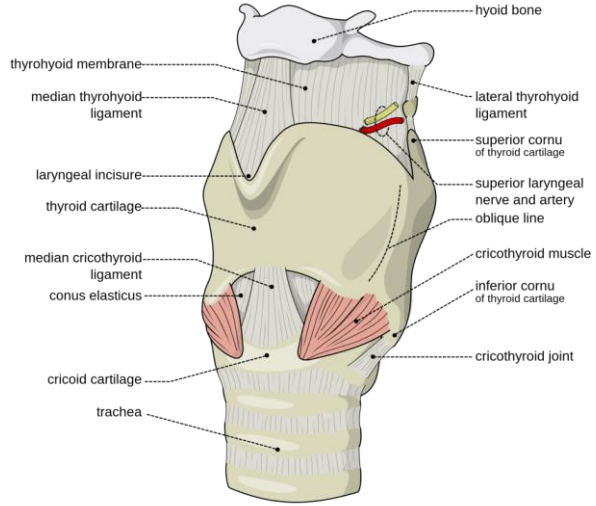
- The framework of the larynx is made up of cartilages.
- These cartilages are connected by joints, membranes & ligaments.
- Moved by muscles.
- Lined by mucous membranes.



THYROID CARTILAGE

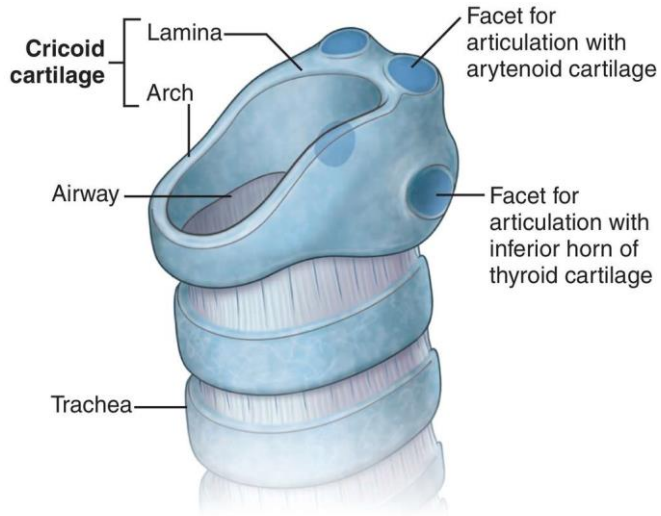
- It is the largest of the laryngeal cartilages.
- It is formed of two laminae; each has superior and inferior horns.
- The angle between two laminae is 90 in male and 120 in female.
- It has two notches superior and inferior at the meeting of the two laminae.
- It is connections superiorly to hyoid bone and inferiorly to cricoid cartilage.





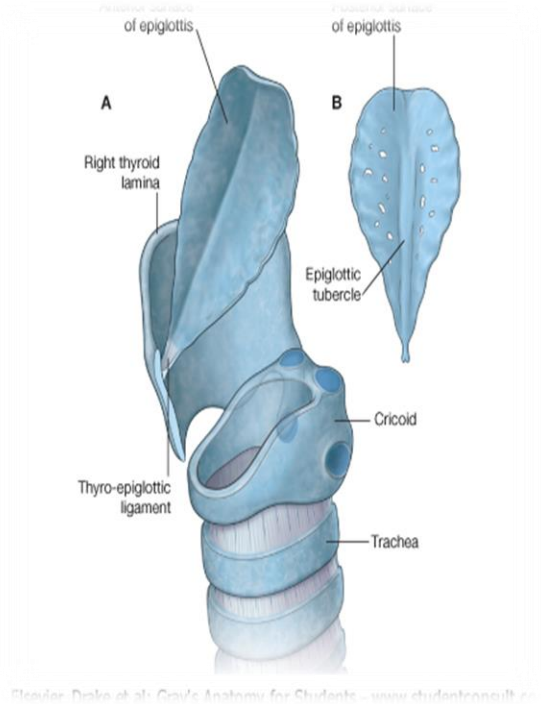
THYROID CARTILAGE

- It is hyaline cartilage.
- It has a ring shape, having a narrow anterior arch and wide posterior lamina.
- It is the only complete ring of cartilage around the trachea.
- Connected superiorly to thyroid cartilage and inferiorly to the first ring of cartilages around the trachea.
- The function of the cricoid cartilage is to provide attachments for muscles, cartilages, and ligaments.
- It is also involved in opening and closing the airway and in speech production.



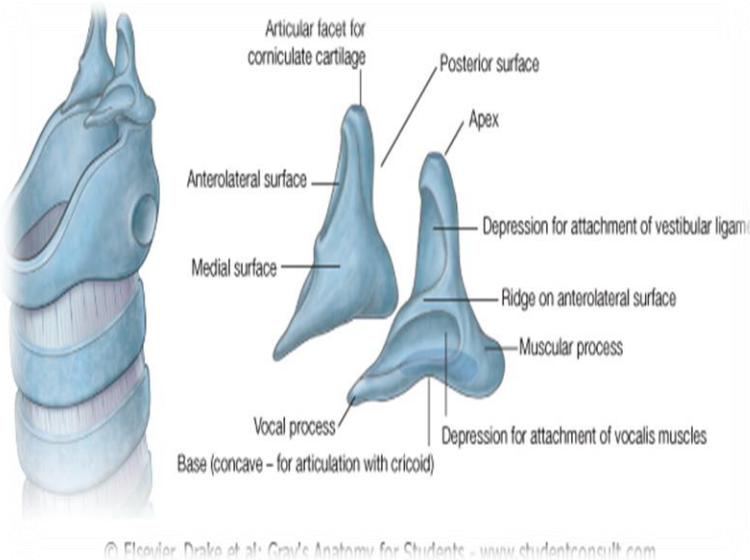
EPIGLOTTIS

- It is leaf-shaped elastic cartilage.
- It projects obliquely upwards behind the tongue and the hyoid bone.
- It stands open during breathing allowing air pass into the larynx.
- It closes during swallowing to prevent aspiration, forcing the swallowed liquids or food to the esophagus.
- It is connected by its stalk to the back of the thyroid cartilage.
- The upper end is free.



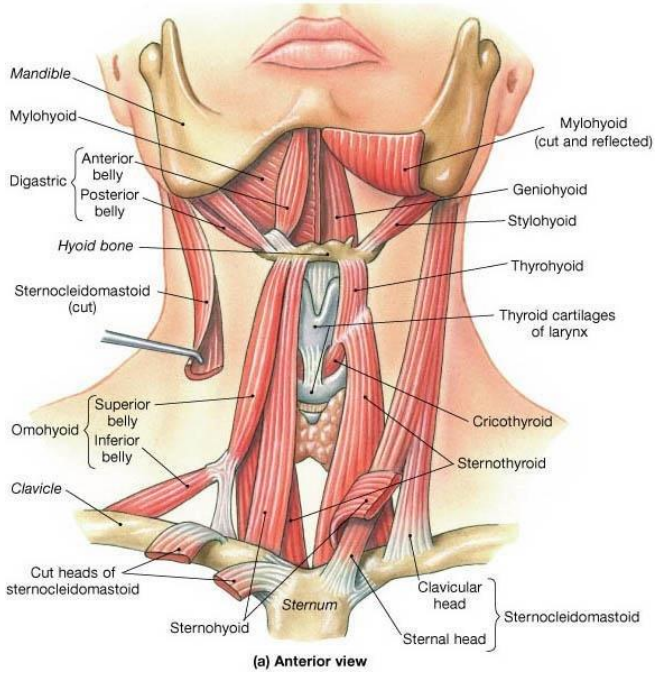
ARYTENOID CARTILAGE

- It is paired hyaline cartilage.
- It is shaped like a 3-sided pyramid.
- Its base sits on the superior surface of the cricoid lamina.
- The apex is directed superiorly to support the corniculate cartilage.
- The muscular process is directed laterally to give attachment to some muscles.



THE MUSCLES

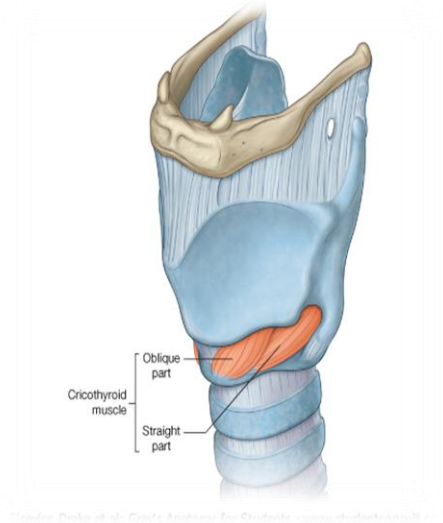
- There are two major groups of muscles:
- **Extrinsic Muscles** to move the whole larynx (elevators and depressors).
- **Intrinsic Muscles** to move structures within larynx.
  - Control of laryngeal inlet.
  - Control of rima glottidis.
  - Control of length and tension of vocal cords.

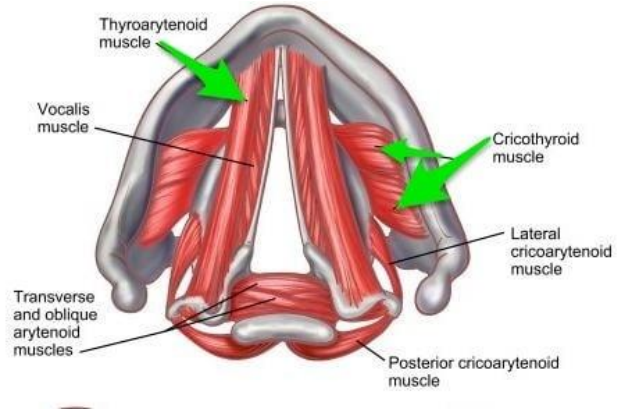


(a) Anterior view

CRICOTHYROID MUSCLE

- **Origin:** Anterior part of arch of cricoid.
- **Insertion:** Inferior border & inferior horn of thyroid.
- **Function:** Flexion at cricothyroid joint.
- **Action:** Lengthens and tightens the vocal ligament.
- **Nerve supply:** External laryngeal nerve of superior laryngeal of vagus.





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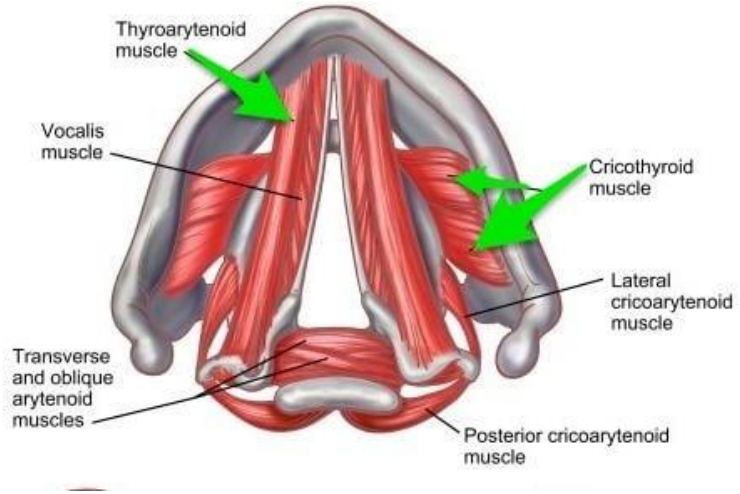
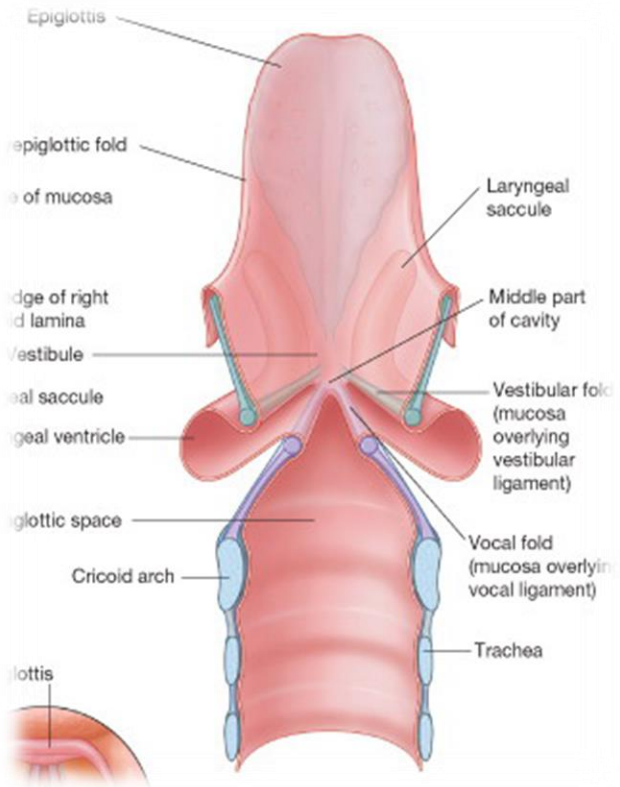
THYROARYTENOID MUSCLE

- **Origin:** Front the lower half of the angle of the thyroid cartilage, and from the middle cricothyroid ligament.
- **Insertion:** Into the base and anterior surface of the arytenoid cartilage.
- **Function:** Draw the arytenoid cartilages forward toward the thyroid to relax and shorten the vocal folds.
- **Nerve supply:** Recurrent laryngeal nerve.



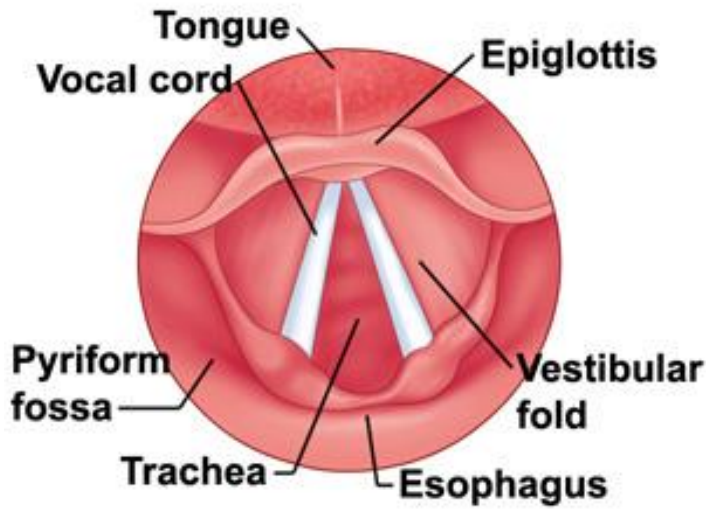
INTERIOR OF LARYNX

- It is divided into three parts:
    1. **Vestibule:** between laryngeal inlet and vestibular fold.
    2. **Ventricle:** a depression extending laterally between vestibular and vocal folds.
    3. **Infraglottic cavity:** it lies between the vocal fold and lower border of cricoid cartilage.
- It is continuous with the trachea inferiorly.



VOCAL CORDS

- The vocal cords (known also as vocal folds) are located within the larynx (also colloquially
- Known as the voice box at the top of the trachea.
- Vocal cords are open during inhalation and come together to close during swallowing and phonation.
- When cords are closed, the vocal folds may vibrate and modulate the expelled airflow from the lungs to produce speech and singing.



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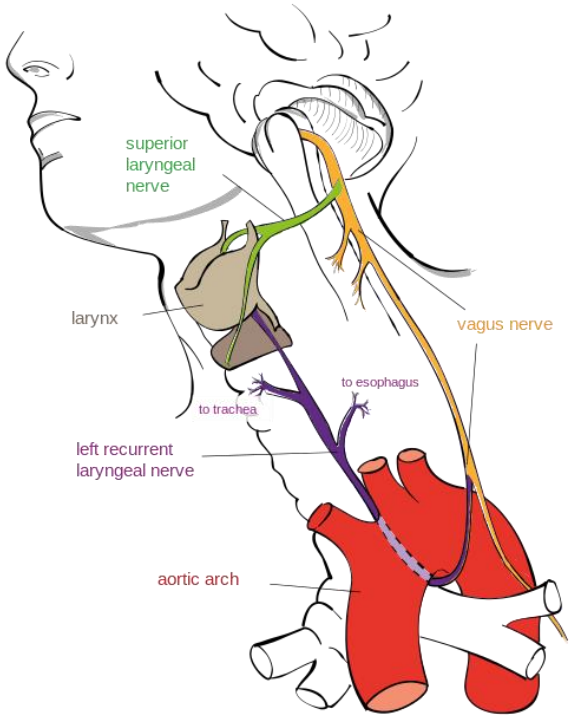
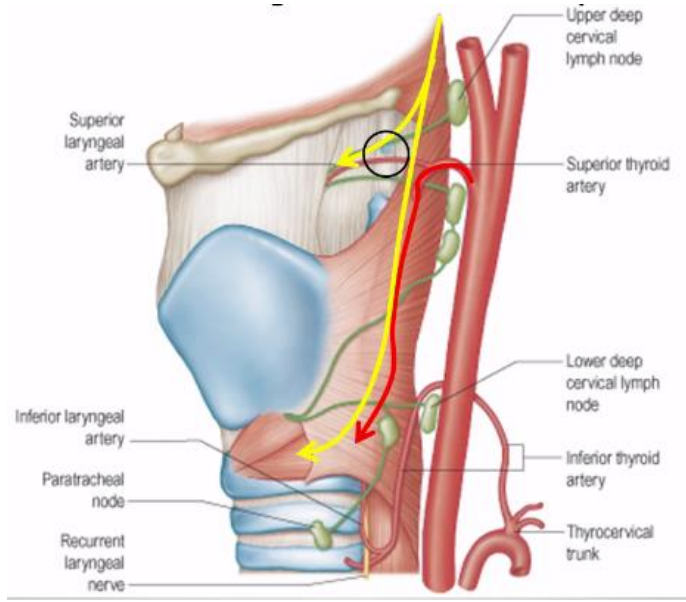
INNERVATION

- **Motor innervation** is provided to all muscles of the larynx by recurrent laryngeal nerve except cricothyroid muscle which is innervated by external laryngeal branch of superior laryngeal nerve.
- Sensory innervation is provided by:
  - Internal laryngeal nerve (above vocal cords).
  - Recurrent laryngeal nerve (below vocal cords).



BLOOD SUPPLY

- **Superior laryngeal artery** which is a branch of superior thyroid artery.
- **Inferior laryngeal artery** which is a branch of inferior thyroid artery.



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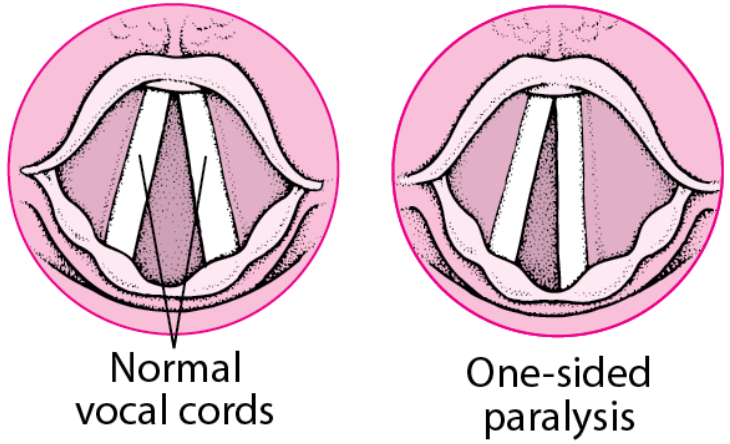
VOCAL CORDS PARALYSIS

- The vocal cords are responsible for the production of speech.
- Their movement is controlled by the intrinsic muscles of the larynx.
- Due to its long course, the recurrent laryngeal nerve is susceptible to damage.
- If unilateral RLN palsy, one vocal cord is paralysed. The other vocal cord tends to compensate, and speech is not affected to a great degree, although the patient may experience hoarseness of voice.
- If bilateral RLN palsy, both vocal cords are paralysed in a position between adduction and abduction. Breathing is impaired, and phonation cannot occur.



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QUESTIONS?

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