

Anatomy and applied physiology of the throat

ا.د. محمد رديف داود

Throat
=
Mouth
+
Pharynx
+
larynx

Cardinal symptoms of throat pathologies

1. Sore throat.
2. Odynophagia
3. Hoarseness of voice.
4. Stridor.
5. Halitosis.
6. Dysphagia.

Mouth

- The is also known as the **oral cavity**.
- It has three major functions:
- **Digestion** – receives food, transfer it the pharynx to preparing it for digestion in the stomach and small intestine.
- **Communication** – modifies the sound produced in the larynx to create a range of sounds.
- **Breathing** – acts as an air inlet in addition to the nasal cavity.

Anatomy

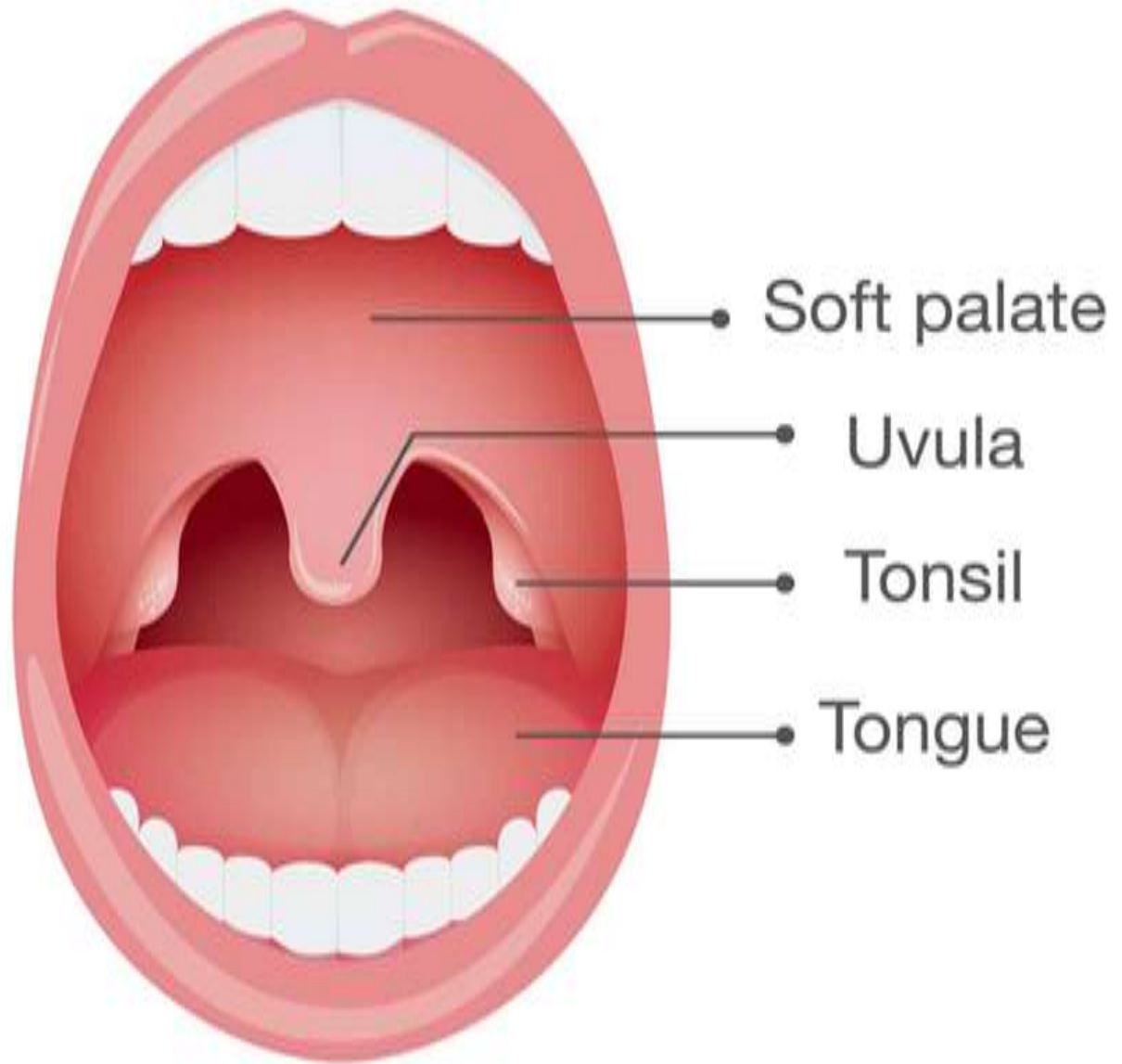
The **oral cavity** lies between the oral fissure (anteriorly – the opening between the lips), and the oropharyngeal isthmus (posteriorly – the opening of the oropharynx)

The two divisions of the oral cavity are the vestibule, and the mouth cavity proper

Vestibule

It is the space between the lips/cheeks, and the gums/teeth

- **Mouth proper**
- The mouth proper lies posteriorly to the vestibule, the tongue fills a large proportion of the cavity of the mouth proper.
- The **roof** of the mouth proper consists of the hard and soft palates.
- The **floor** of the oral cavity consists of several structures : Muscular diaphragm – comprised of the bilateral mylohyoid muscles, geniohyoid muscles, sublingual salivary glands and ducts



• Soft palate

• Uvula

• Tonsil

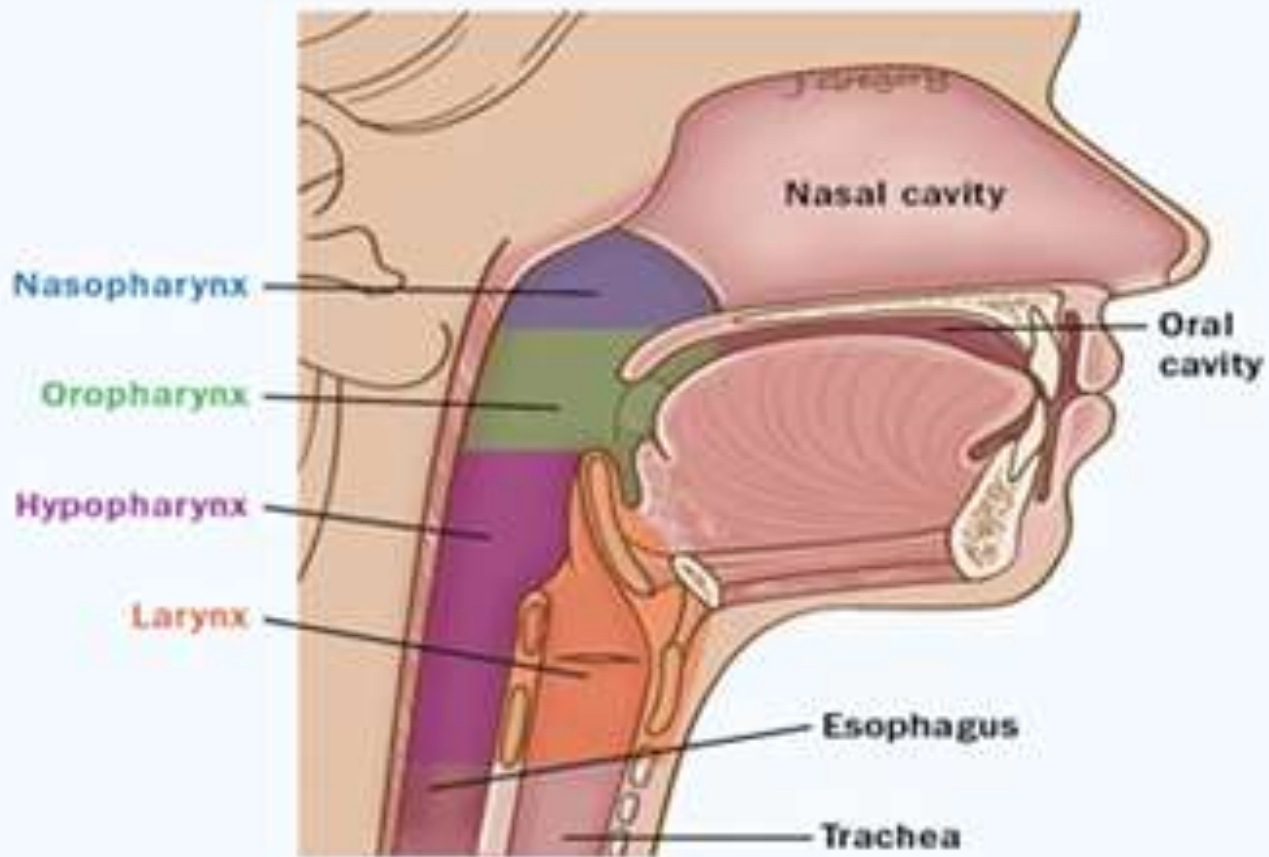
• Tongue

Pharynx

It begins at the base of the skull, and ends at the inferior border of the cricoid cartilage (C6). The pharynx is comprised of three parts (superior to inferior):

- 1. Nasopharynx**
- 2. Oropharynx**
- 3. Laryngopharynx**

Pharynx

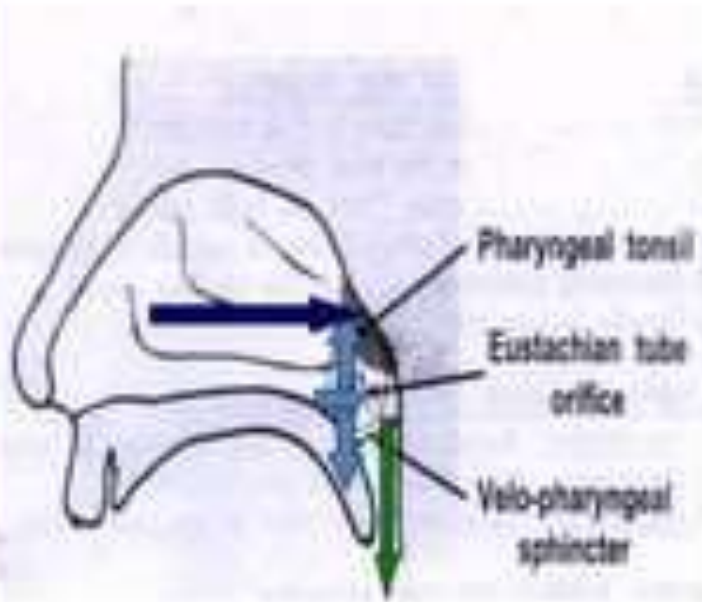


Nasopharynx

- It is found between **the base of the skull and the soft palate**. It is continuous with the nasal cavity, and performs a respiratory **function by conditioning inspired air and propagating it into the larynx**.
- The posterosuperior wall of nasopharynx contains the **adenoid tonsil** , which enlarge between 3-8 years of age and then regress.

Nasopharynx

- Behind the nasal cavity
- Extends from skull
 - Base superiorly to the soft palate inferiorly
- Communicates inferiorly with the oropharynx through the **velo-pharyngeal sphincter**
- The **nasopharyngeal tonsil** lies in the roof
- The pharyngeal opening of ET lies in the lateral wall



Nasopharyngeal pathologies

Children

Adults

Adenoid

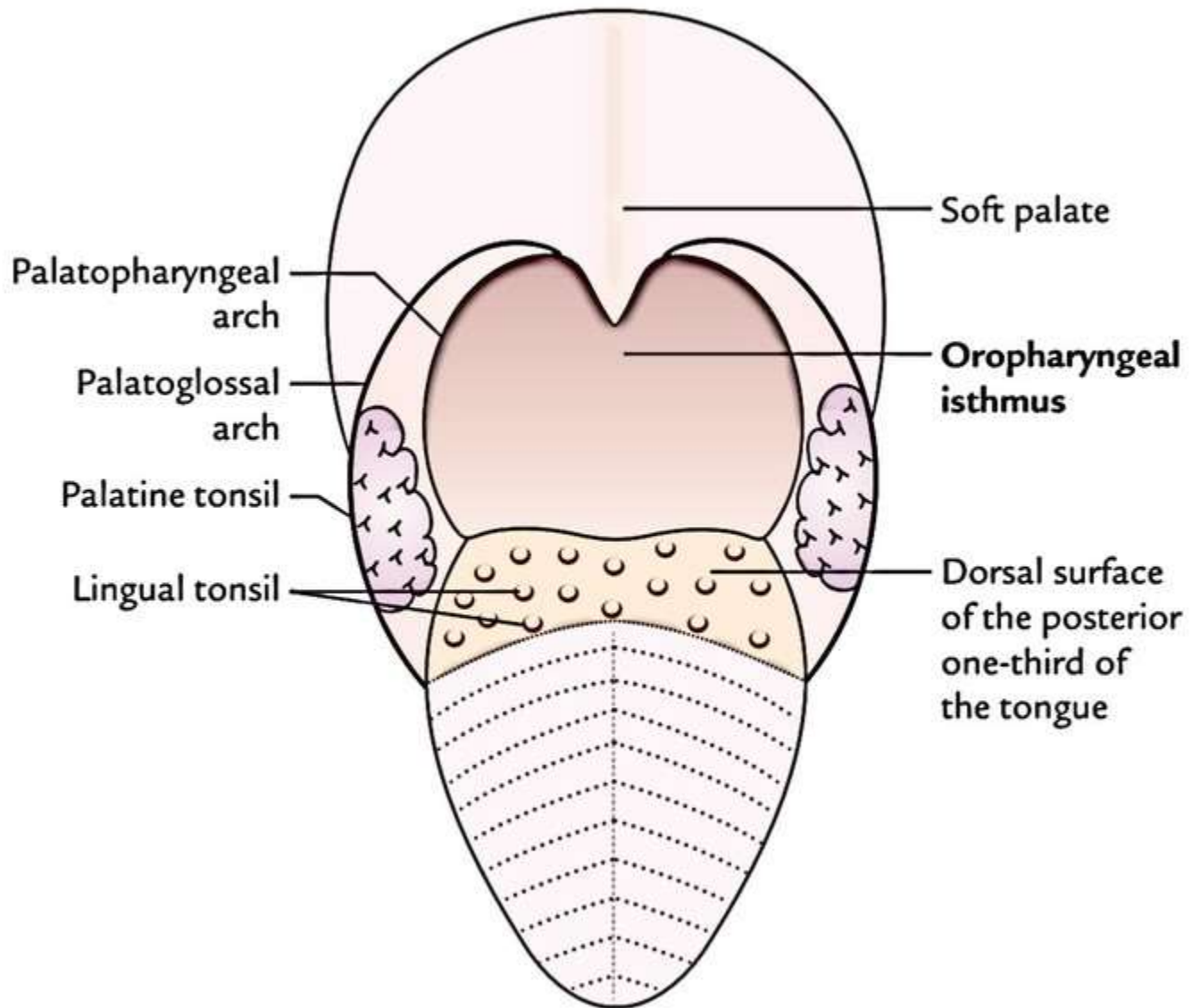


Oropharynx

It is the middle part of the pharynx, located between **the soft palate and the superior border of the epiglottis.**

It contains the following structures:

1. Posterior 1/3 of the tongue.
 2. Lingual tonsils – lymphoid tissue at the base of the tongue.
 3. Palatine tonsils – lymphoid tissue located in the tonsillar fossa (between the palatoglossal and palatopharyngeal
 4. Superior constrictor muscle.
- **Waldeyer's ring** is the ring of lymphoid tissue in the naso- and oropharynx formed by the **paired palatine tonsils, the adenoid tonsil, lingual tonsil and scattered lymph nodes.**
 - The oropharynx is involved in the **voluntary and involuntary phases of swallowing**



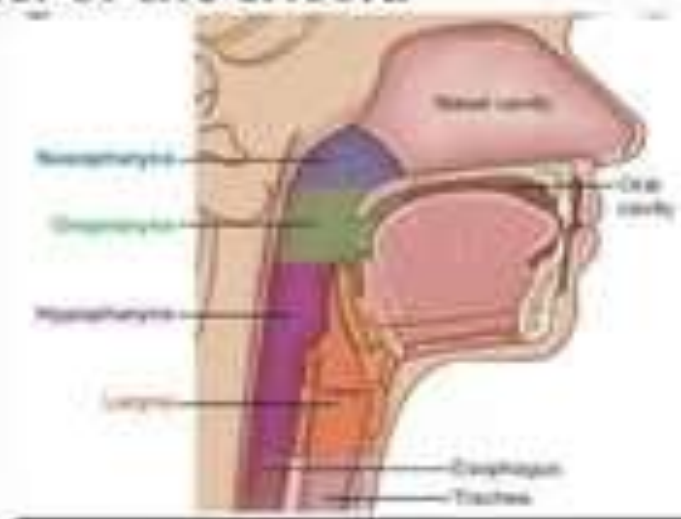
Laryngopharynx

- 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 continuous inferiorly with the oesophagus.
- It is found posterior to the larynx and communicates with it via the laryngeal inlet, lateral to which one can find the piriform fossae.
- The laryngopharynx contains the **middle and inferior pharyngeal constrictors**

Hypopharynx/laryngopharynx

The hypopharynx extend

- from the level of the hyoid bone above
 - to that of the lower border of the cricoid cartilage below.
-
- Lies opposite the 4th
5th 6th cervical vertebrae



Muscles of pharynx

- There are two main groups of pharyngeal muscles;

Circular

- 1. Superior pharyngeal constrictor**
- 2. Middle pharyngeal constrictor**
- 3. Inferior pharyngeal constrictor**

- All pharyngeal constrictors muscles are innervated by the **vagus nerve (CN X)**

longitudinal muscles

- 1. Stylopharyngeus**

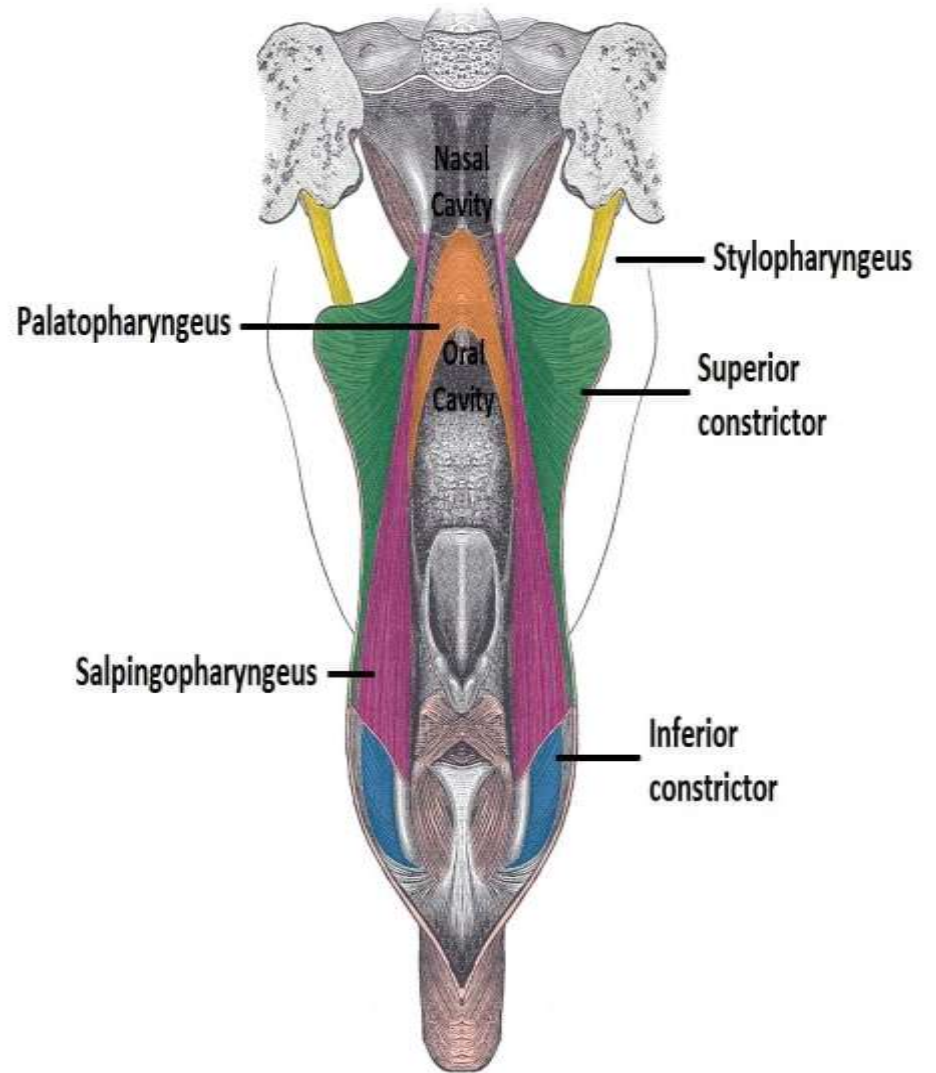
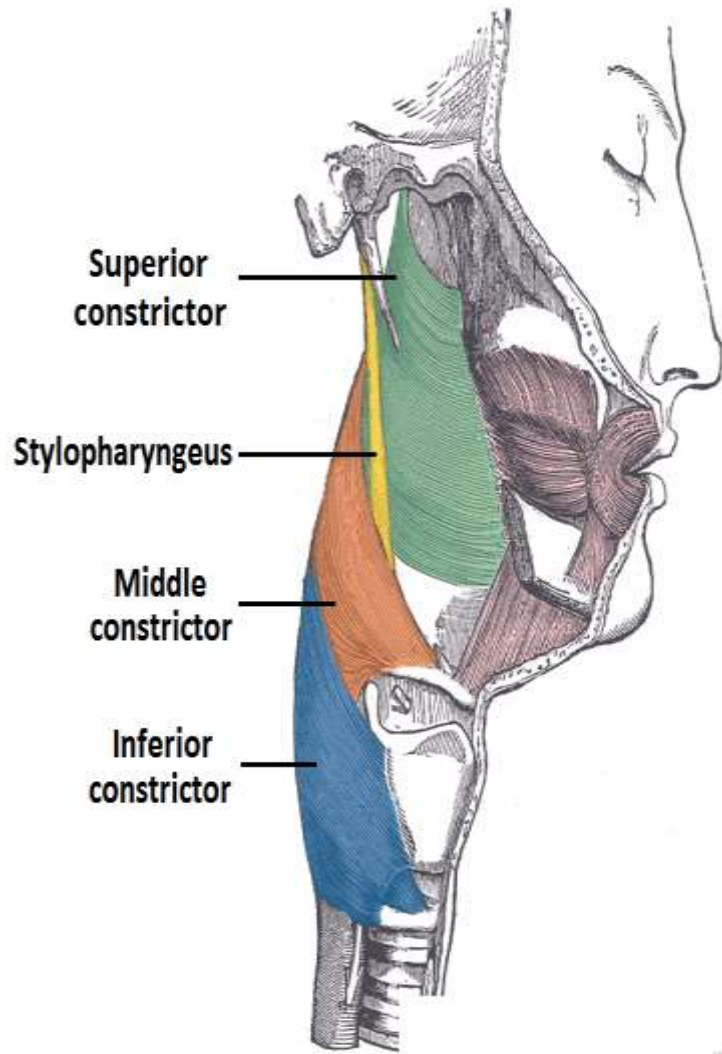
it is innervated by the glossopharyngeal nerve

- 2. Palatopharyngeus**

Innervated by the vagus nerve

- 3. Salpingopharyngeus**

Innervated by the vagus nerve



Blood supply of the pharynx

Arterial supply to the pharynx is via branches of the **external carotid** artery:

1. Ascending pharyngeal artery
2. Branches of the facial artery
3. Branches of the lingual and maxillary arteries.

Venous drainage is achieved by the **pharyngeal venous plexus**, which drains into the internal jugular vein

larynx

The cartilaginous framework

A. Unpaired cartilages

1. Epiglottis
2. The cricoid cartilage

B. Paired cartilages

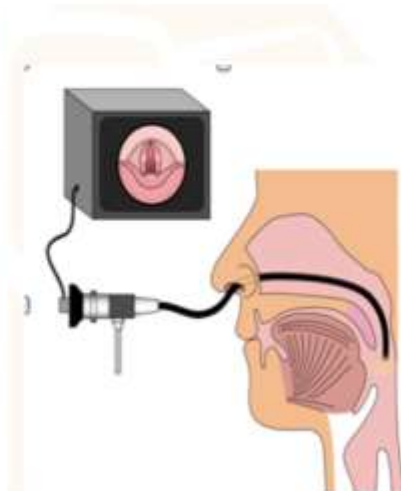
1. The arytenoids cartilages
2. The thyroid cartilages

Viewing of the larynx

1. Fiber-optic laryngoscopy= fiber-optic nasopharyngoscopy.
2. Rigid direct laryngoscopy= A) Macintosh
B) Rigid endoscope (laryngoscope)
3. Indirect laryngoscopy= laryngeal mirror

Endoscopy

1. Fiber-optic laryngoscopy=
fiber-optic Nasopharyngoscopy



2. Direct rigid laryngoscopy

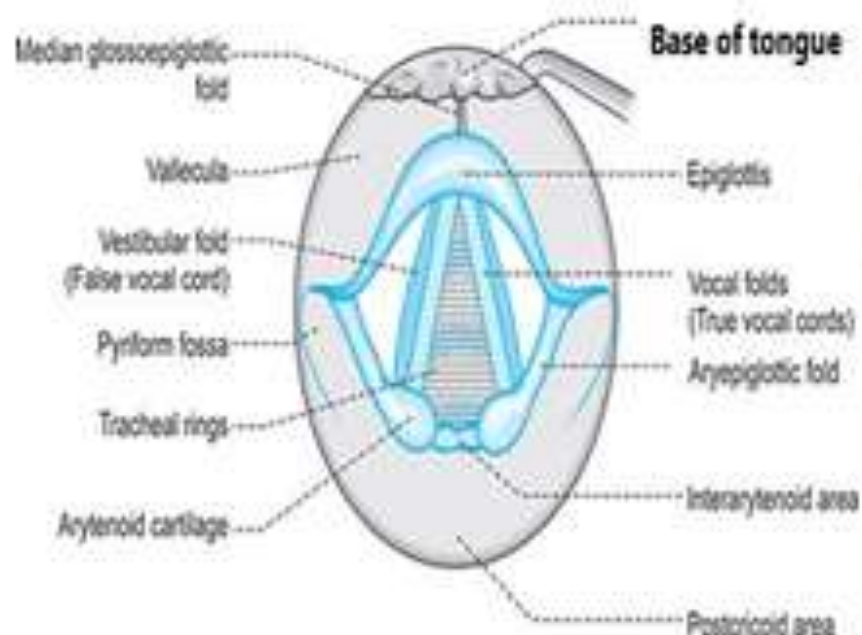
A. Macintosh

B. Rigid endoscopy
(rigid laryngoscope)



Laryngeal anatomy

Indirect laryngoscopy "IDL"



1. True vocal cords
2. False cords
3. Epiglottis

4. Aryepiglottic folds
5. Arytenoids
6. Pyriform fossae
7. Tongue base

Pathologies seen by indirect laryngoscopy



Examination of Vocal Cords



Normal vocal cords



Contact ulcers



Polyp



Nodules



Unilateral paralysis



Cancer

Examination Findings

The muscles of the larynx are divided into two groups:

Extrinsic muscles:

which produce the movements of the hyoid bone. These are the infrahyoid (sternohyoid, omohyoid, sternothyroid, thyrohyoid) and suprahyoid muscles (stylohyoid, digastric, mylohyoid, geniohyoid).

Intrinsic muscles:

1. Muscle that open the vocal cords

Posterior cricoarytenoid muscle

2. Muscles that close the vocal cords

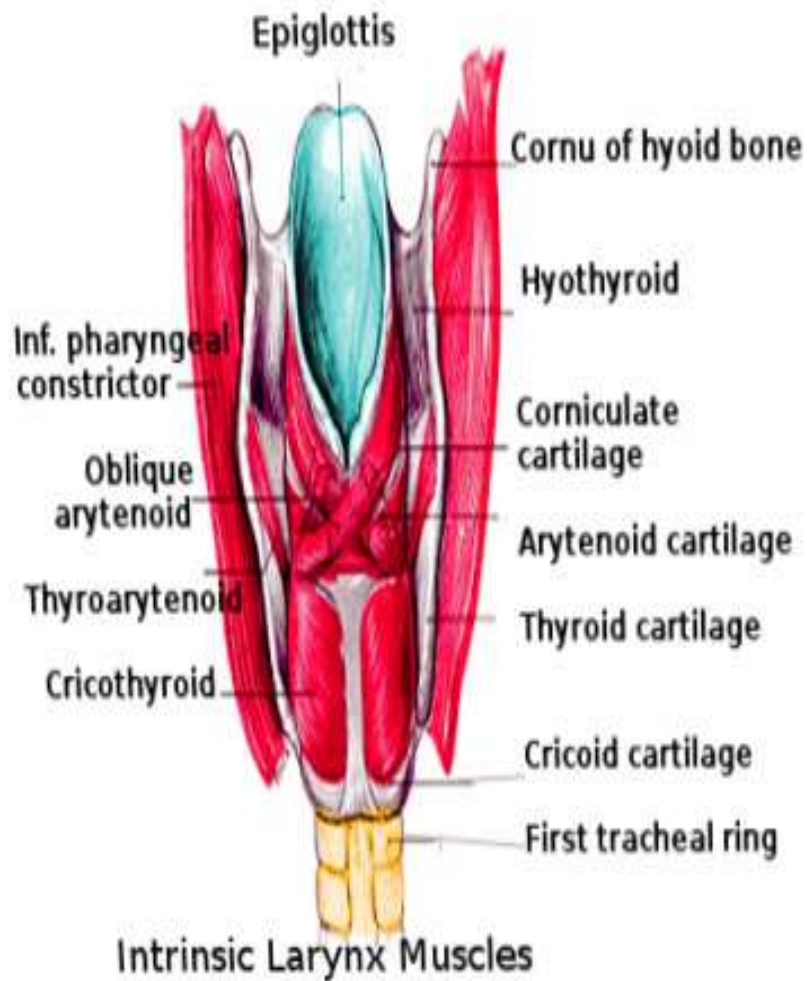
A- Lateral cricoarytenoid muscle

B- Interarytenoid muscle

C- Cricothyroid muscle

3. Muscle that increase the tension of the vocal cords

Thyroarytenoid (vocalis) muscle



Arterial blood supply

1. Superior Laryngeal artery: branch of superior thyroid artery
2. Inferior Laryngeal artery: branch of inferior thyroid artery
3. Cricothyroid artery: branch of superior thyroid artery

Nerve Supply of the Larynx

Sensory Nerves:

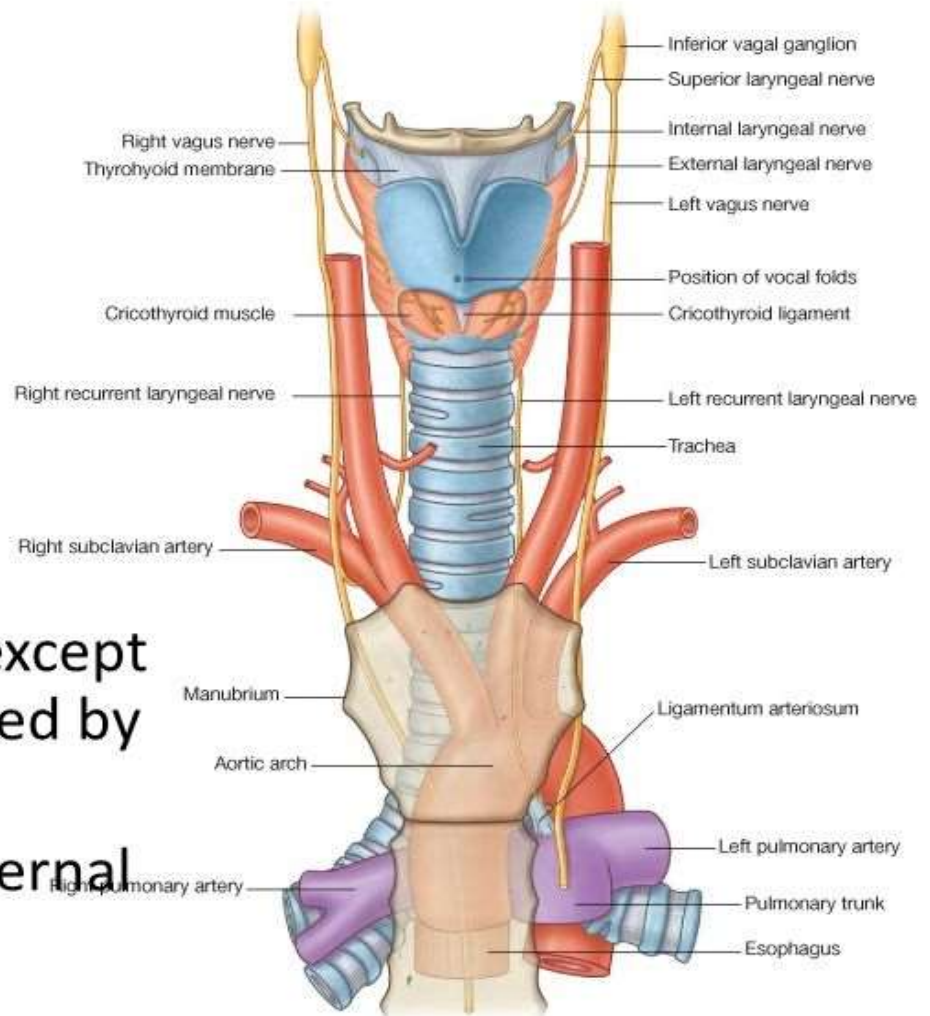
Above vocal cords: Internal laryngeal branch of superior laryngeal branch of vagus.

Below vocal cords: Recurrent laryngeal nerve.

Motor Nerves:

All intrinsic muscles of larynx except **cricothyroid muscle** are supplied by **recurrent laryngeal nerve**.

Cricothyroid is supplied by external laryngeal branch of superior laryngeal branch of vagus.



Functions of the larynx

1. Respiration.
2. Phonation (voice).
3. Protection of lower airways.
4. Fixation of chest

THANK YOU