



433 Teams
ENT

18

Pharynx 1

Color index:

432 Team – **Important** – 433 Notes – Not important

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Anatomy of the pharynx

It extends from the base of the skull to the level 6 cervical vertebra at the lower border of cricoid cartilage.

Funnel shaped, 10 cm length.

Widest portion (5cm) at hyoid.

Narrowest portion(1.5cm) at caudal end.

Parts of the pharynx:

1. Nasopharynx

Opens **anteriorly** to the nose,

Above: the base of skull

Below: soft palate

Laterally:

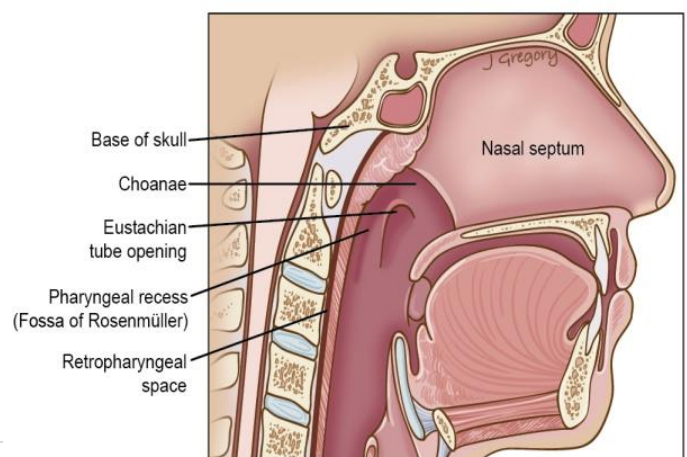
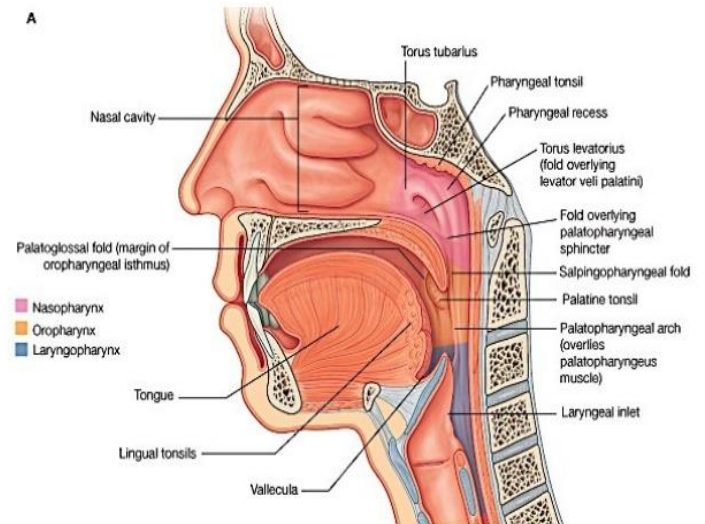
1--- Opening of the Eustachian tube

2--- Torus tubarius (the elevated edge of the Eustachian tube opening).

3--- Pharyngeal recess (fossa of rosenmuller) (Is a depression in the pharyngeal wall behind the torus tubarius) (very important to examine nasopharynx in smoker adult complaining of nasal obstruction because nasopharyngeal cancer commonly occurs in this fossa).

4--- Adenoid

5--- Nasopharyngeal isthmus (opening in the floor between the soft palate and the posterior pharyngeal wall).



2. Oropharynx

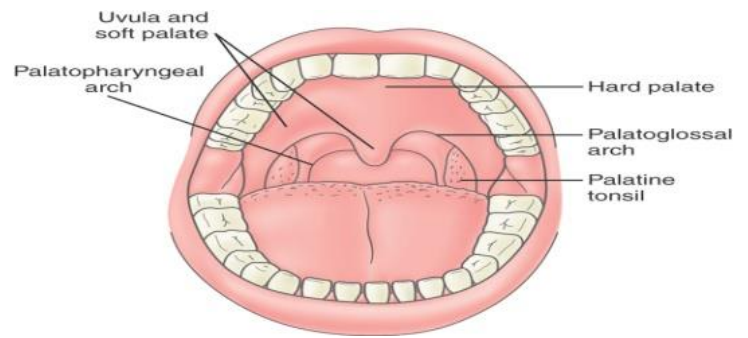
Opens **anteriorly** to the mouth and **devided from the oral cavity by Tonsillar pillar.**

Above: soft palate.

Below: the upper border of epiglottis.

Palatine tonsils: between the anterior and posterior pillars.

Valleculae: Is a depression on each side of the median glossoepiglottic. It is the area between the epiglottis and base of the tongue.



3. Laryngopharynx (Hypopharynx)

Opens **anteriorly** to the larynx

Above: the upper border of the epiglottis

Below: lower border of cricoid

Pyramiform fossa: (Is a depression in the mucous membrane on each side of the laryngeal inlet).

--- When the patient presents with halitosis, check the oral hygiene and make sure that the patient is cleaning the tongue, and exclude other causes like reflux and diverticula.

Structures of pharynx

Pharyngeal Wall:

Mucous membrane

Submucosa

Muscular layer

Fibrous layer (Buccopharyngeal fascia)

Mucous membrane:

- Nasopharynx – Ciliated columnar epithelium
- Oro and hypopharynx –Stratified squamous epithelium

Submucosa:

- Nerves, blood vessels, and lymphatics.
- Mucous and salivary glands .
- Subepithelial lymphoid tissue (Waldeyer's Ring).

Characteristics of Waldeyer's Ring:

- No afferents
- Efferent to deep cervical nodes
- No capsule except the palatine tonsils

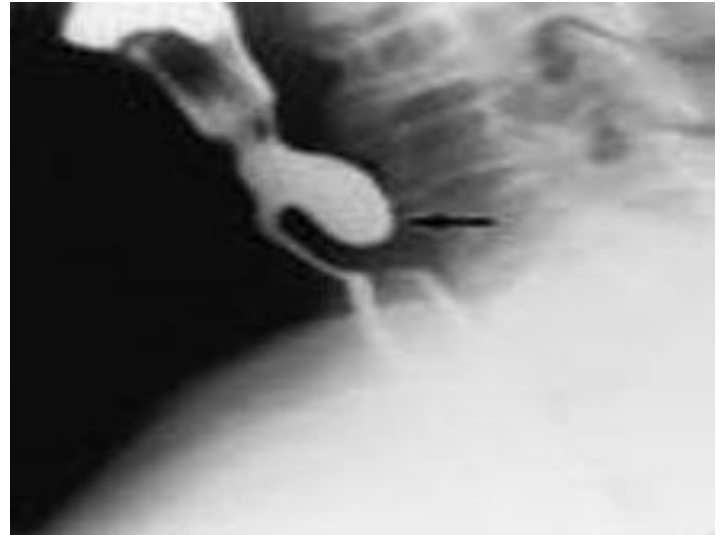
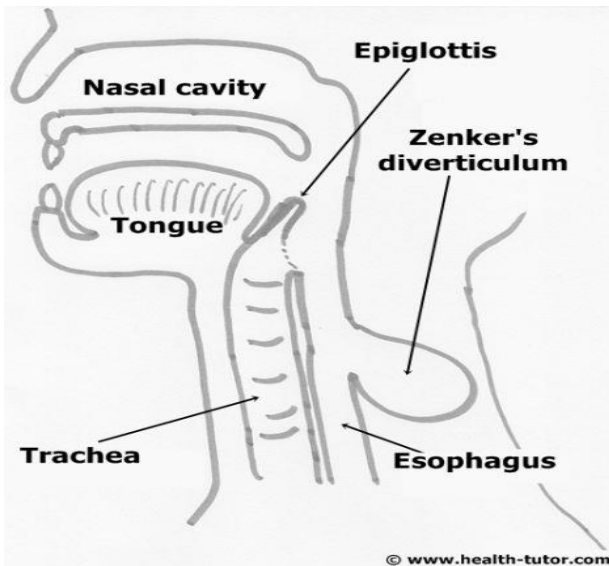
Muscular layer

- **External:** Three constrictor muscles:

1. **Superior constrictor:** Arises from pterygoid, pterygomandibular ligament post end of mylohyoid fibers
2. **Middle constrictor:** Arises from the hyoid bone and stylohyoid ligament.
3. **Inferior constrictor:** Thyropharyngeus, Cricopharyngeus.

Killian's dehiscence:

Potential gap between the thyropharyngeus and cricopharyngeus (Zenker's diverticulum occurs in this weak area and diagnosed by barium swallow)



- **Internal:** Three muscles:

1. Stylopharyngus
2. Salpingopharyngus
3. palatopharyngus

Pharyngeal aponeurosis:

Incomplete connective tissue coat in the lateral and posterior walls of the pharynx between the muscular layers.

Buccopharyngeal fascia

Thin layer covers the muscular layer of pharyngeal wall.

Nerve Supply

Sensory: Each of the three sections of the pharynx have a different innervation:

- The **nasopharynx** is innervated by the maxillary branch of the trigeminal nerve (CN V).
- The **oropharynx** by the glossopharyngeal nerve (CN IX).
- The **laryngopharynx** by the vagus nerve (CN X).

Motor: All the muscles of the pharynx are innervated by the vagus nerve (CN X), except for the stylopharyngeus, which is innervated by the glossopharyngeal nerve (CN IX).

Also the Sympathetic fibers of the superior cervical ganglia play a role in the innervation.

Blood supply

Arterial from the external carotid artery:

- Ascending pharyngeal
- The lingual artery
- The facial artery
- The maxillary artery

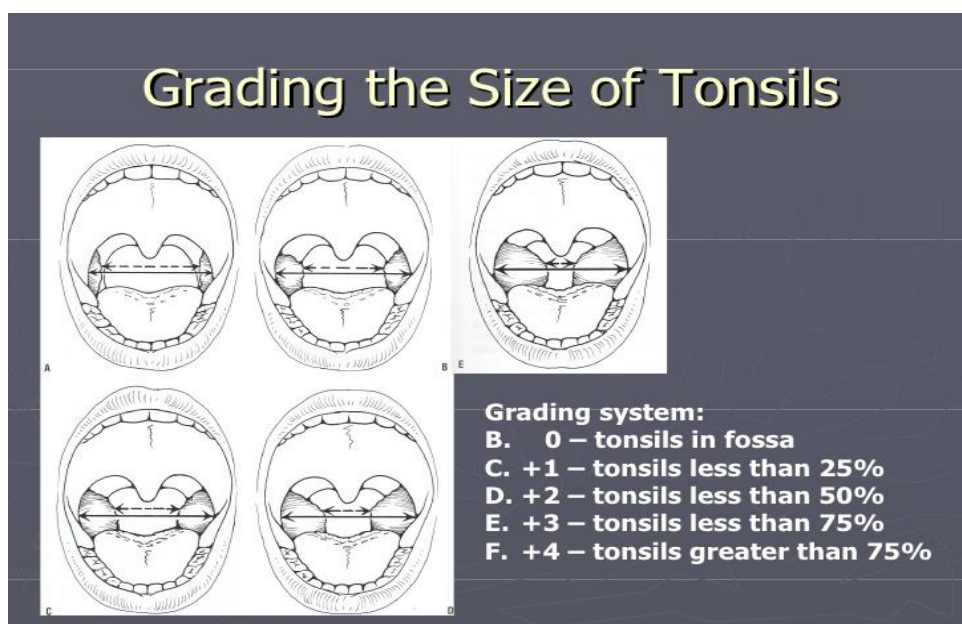
Venous drainage to the internal jugular

Lymphatics

- Retropharyngeal nodes.
- Deep cervical (jugular) nodes.

Palatine tonsils:

- 12---15 crypts.
- The deep surface is separated from the constrictor muscles of the pharynx by connective tissue (capsule).
- When tonsillectomy is performed you have to make the incision in the connective tissue, if the surgeon goes more medially he will enter the tonsils, if more lateral he will enter the muscles.



Adenoid:

Is common in children and it is diminished in size with growing, only big adenoid is removed, the mother is noticing her baby choking while he is sleeping and moving and nocturnal enuresis)

- No capsule.
- Lingual tonsils.
- Tubal tonsils.
- Lateral pharyngeal bands.
- discrete nodules.

Relations of pharynx:

Posteriorly: prevertebral fascia

Anteriorly: Parapharyngeal space

Parapharyngeal Space:

Potential space lies outside the pharynx.

Triangular in cross section, it extends from the base of the skull above to the sup mediastinum and apex of hyoid bone.

- Anteromedial wall:** Buccopharyngeal fascia
- Posteromedial wall:** Cervical vertebrae, prevertebral muscle and fascia
- Lateral wall:**
 - o **(Up)** the mandible, pterygoid muscle, parotid gland
 - o **(Lower)** Sternomastoid muscle

Compartment:

- Prestyloid: (internal maxillary artery, fat, inferior alveolar, lingual, and auriculotemporal nerves.)

- Poststyloid: (if the patient has tonsillitis and on examination there is bulge in lateral pharyngeal wall, on CT there is postsyloid abscess so I have to do incision and drainage since this is a dangerous area, they could have carotid rupture)

--- Neurovascular bundle (carotid artery, IJV, sympathetic chain, CN IX, X and, XI)

Retropharyngeal Space: It extend from the base of skull to superior mediastinum.

Lies behind the pharynx

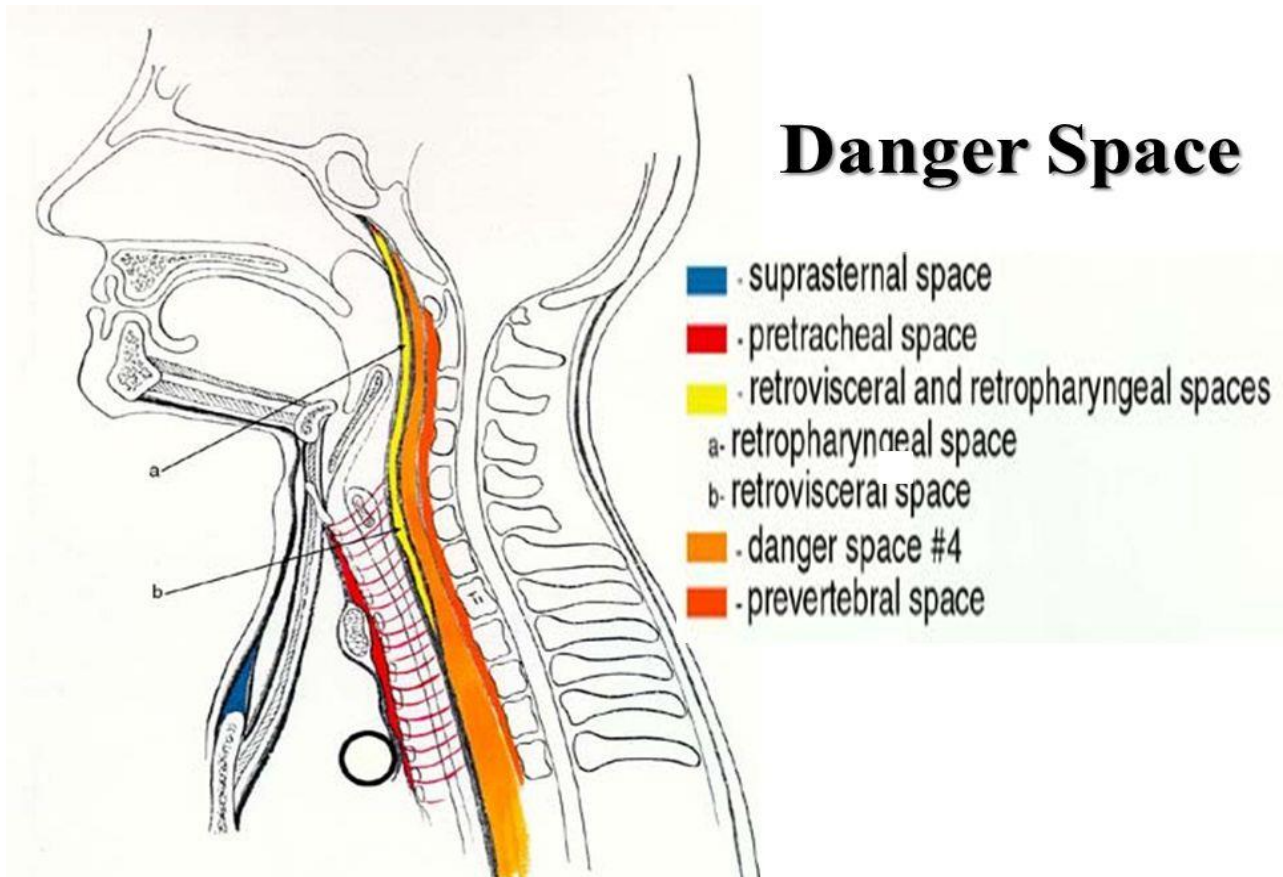
- ✓✓ **Anterior:** posterior pharyngeal wall and its covering buccopharyngeal fascia.
- ✓✓ **Posterior:** cervical vertebrae and muscles and fascia
- ✓✓ **Contents:**
Retropharyngeal lymph nodes

(If a child has tonsillitis and on examination you found a bulge in the posterior wall (in front of you) you do CT scan it is abscess, but if he is adult but without any acute infection, you think about TB).



Posterior to the retropharyngeal space, there is Danger Area, any infection in this area lead to mediastinitis.

Also there is Prevertebral Space and any infection in this space will be transmitted all the way down to the coccyx.



Physiology of the pharynx:

1- Functions of the sub epithelial lymphoid tissue: (protective functions)

- Formation of lymphocytes
- Formation of antibodies
- Acquisition of immunity
- Localization of infection

4- Respiration

5- Speech

6- Resonating cavity

7- Articulation

8- Taste: taste buds

2- Salivation

3- Deglutition: (Three stages)

- Oral stage: voluntary
- pharyngeal stage
- esophageal stage

Summary

- The pharynx is situated behind the nasal cavities, the mouth and the larynx.
- It is divided into nasal, oral and laryngeal parts
- It extends from base of the skull into the 6 cervical vertebra

- It is fibromuscular structure which is covered by mucus membrane and 4 layers and lymphatic tissue called (Waldeyer's ring)
- It has 3 external muscles and 3 internal muscles

- Killian's dehiscence is the weakest area where Zenker's diverticulum occur
- Para and retropharyngeal spaces are important for their relations to the pharynx and infection and abscess formation

- Function of the lymphatic tissue in the pharynx for protection by formation lymphocytes and antibodies

- Function of pharynx is salivation, Deglutition, respiration, speech, resonating cavity, articulation and taste.

MCQs

Q1. Structures passing between upper border of superior constrictor muscle and base of skull include all except?

- A. Levator palatini
- B. Tensor tympani
- C. Eustachian tube
- D. Ascending palatine artery

Q2. All of the following statements about Zenker's diverticulum are correct except?

- A. Arises from posterior part of hypopharynx
- B. Is a traction diverticulum
- C. Causes regurgitation of undigested food
- D. Treated by diverticulectomy and cricopharyngeal myotomy

Q3. Characteristic features of submucous cleft palate include all except?

- A. Bifid uvula
- B. Notch of posterior border of hard palate
- C. Deficient palatal muscles
- D. Common association with cleft lip

Q4. All of the following cause a grey-white membrane on the tonsils except?

- A. Infectious mononucleosis
- B. Ludwig's angina
- C. Streptococcal tonsillitis
- D. Diphtheria

Answers:

1- B

2- C

3- D

4- B

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