



MED437
KING SAUD UNIVERSITY



Anatomy of the Nasal Cavity & Pharynx

Lecture 2



Please check our [Editing File](#).

هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

Objectives

- Describe the boundaries of the nasal cavity.
- Describe the nasal conchae and meati.
- Demonstrate the openings in each meatus.
- Describe the paranasal sinuses and their functions.
- Describe the pharynx and its parts.

- Text in **BLUE** was found only in the boys' slides
- Text in **PINK** was found only in the girls' slides
- **Text in RED is considered important**
- Text in **GREY** is considered extra notes

Start with the videos it may help you understand some points!

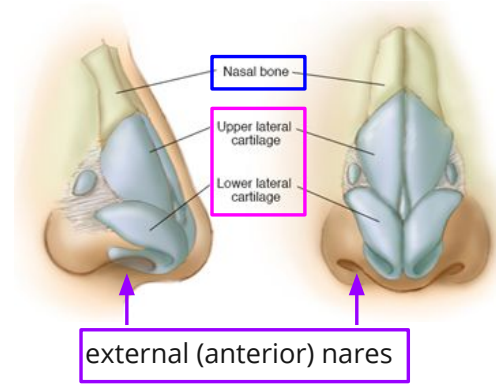


Nose

The **external (anterior) nares** "فتحات الأنف" or nostrils, lead to the nasal cavity.

Formed **above** by: **Bony skeleton**

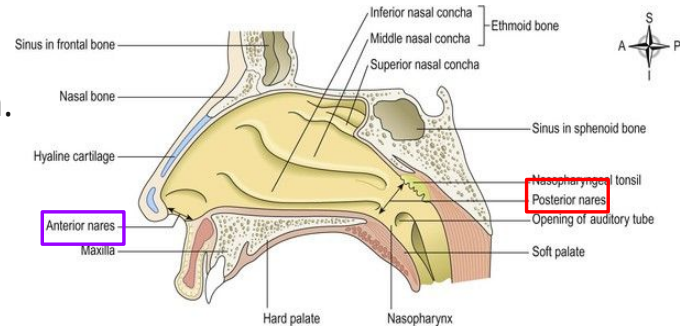
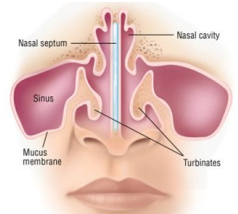
Formed **below** by: **plates of hyaline cartilage.**



Nasal cavity

Extends from **external (anterior) nares** to the **posterior nares (choanae).**

Divided into right & left halves by the nasal septum.



Each halves of nasal cavity has:

Roof

Narrow & formed (from behind forward) by the:

- **Body of sphenoid.**
- **Cribriform plate of ethmoid bone.**
- **Frontal bone.**
- **Nasal bone & cartilage**

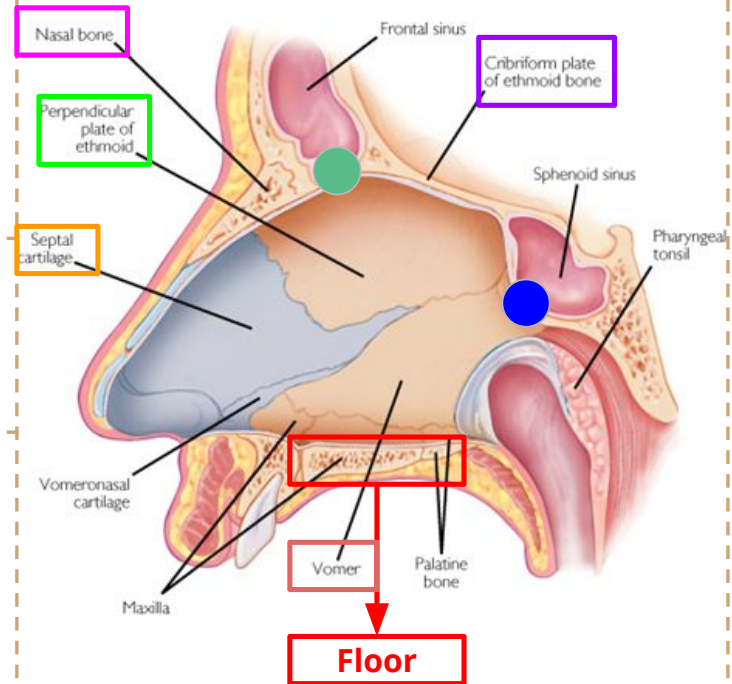
Floor

-Separates nasal cavity from the oral cavity.
-Formed by the hard (bony) palate (there are 2 palates soft & hard).

Medial Wall

(Nasal Septum)

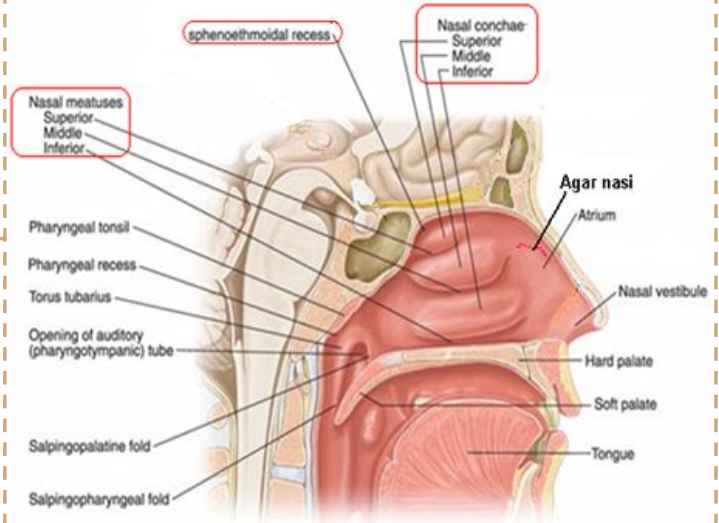
Osteocartilaginous "bone+cartilage" partition.
Formed by:
Perpendicular plate of ethmoid bone.
- **Vomer.**
- **Septal cartilage.**



Each halves of nasal cavity has:

Lateral wall

- Shows three horizontal bony projections, the **superior, middle & inferior conchae**
- The cavity below each concha is called a **meatus** and are named as **superior, middle & inferior** corresponding to the conchae.
- The small space above the superior concha is the **sphenoethmoidal recess**
- The conchae **increase the surface area** of the nasal cavity.
- The **recess & meati** receive the openings of the:
 - ***Paranasal sinuses**
 - ***Nasolacrimal duct**

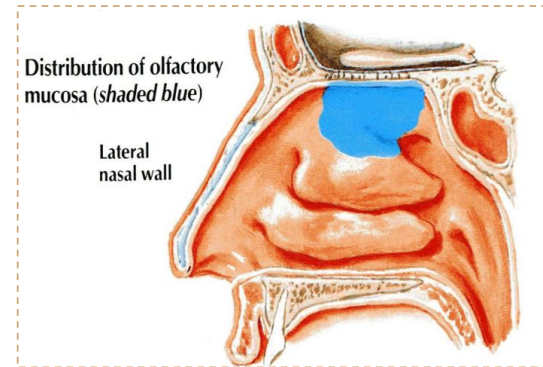
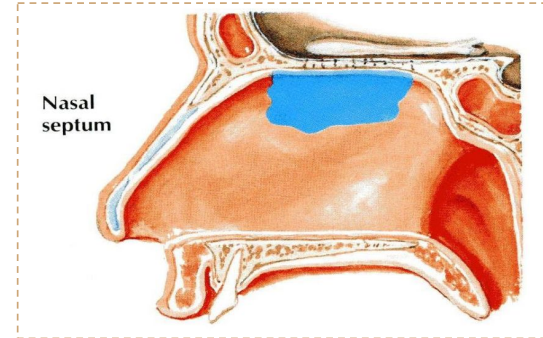


***Don't get confused between the choanae (posterior nares) and the conchae!**

Nasal Mucosa

1-Olfactory: (Related to sense of smell)

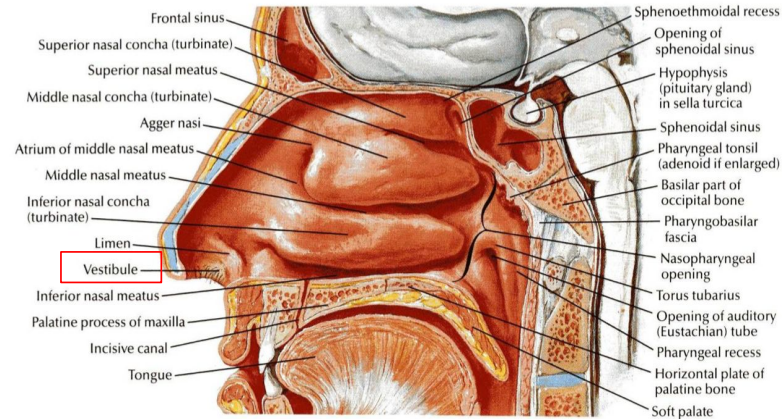
- It is delicate and contains olfactory nerve cells.
- It is present in the **upper part of nasal cavity**:
 - Roof
 - On the lateral wall: it lines the upper surface of the **superior concha** and the **sphenoethmoidal recess**.
 - On the medial wall: it lines the superior part of the nasal septum.



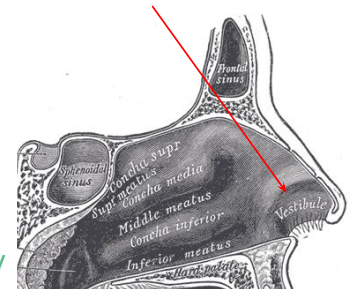
Nasal Mucosa

2-Respiratory mucosa:

- It is thick, ciliated, highly vascular and contains mucous glands & goblet cells.
- It lines the **Lower part** of the nasal cavity.
- It functions to moisten, clean and warm the inspired air.
 - The air is moistened by the **secretion of numerous serous glands**.
 - It is cleaned by the removal of the dust particles by the **ciliary action of the columnar ciliated epithelium** that covers the mucosa.
 - The air is warmed by a **submucous venous plexus**.
- The Vestibule* is lined by Skin. (The only part of the nasal cavity lined by skin and not mucosa, hair can grow on it)

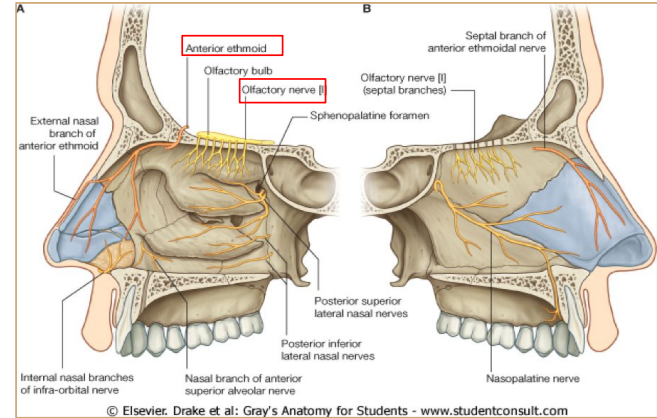


*vestibule:space or cavity at the entrance to another structure



Nerve Supply

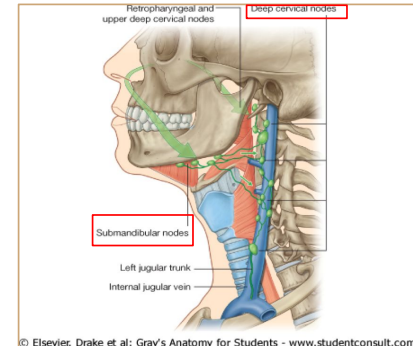
- **Olfactory mucosa** supplied by **olfactory nerves**.
- Nerves of general sensation are derived from:
 - Ophthalmic, and maxillary **division of the trigeminal nerve**.
 - **Anterior ethmoidal nerve**.
 - **Autonomic fibers: Nasal, nasopalatine and palatine branches of the pterygopalatine ganglion.**



Lymphatic Drainage

The lymphatics from the:

- Vestibule drains into the **submandibular lymph nodes**.
- Rest of the cavity drains into the **upper deep cervical lymph nodes**.



Arterial Supply

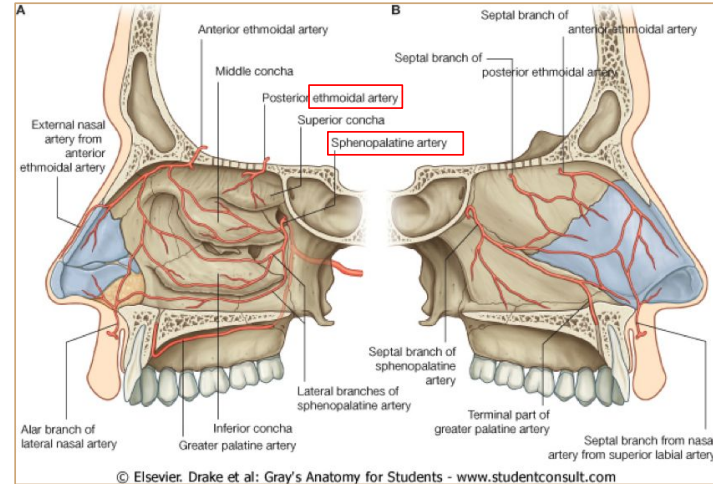
- Branches of the:
 - Maxillary: **sphenopalatine artery**.
 - Facial: **superior labial artery**.
 - Ophthalmic: **ethmoidal arteries**.
- The arteries make a rich anastomosis in the region of the vestibule, and anterior portion of the septum.

Venous Drainage

Submucosal plexus by veins accompany the arteries which drain into the:

- Facial vein
- Ophthalmic vein
- Sphenopalatine vein

Blood Supply

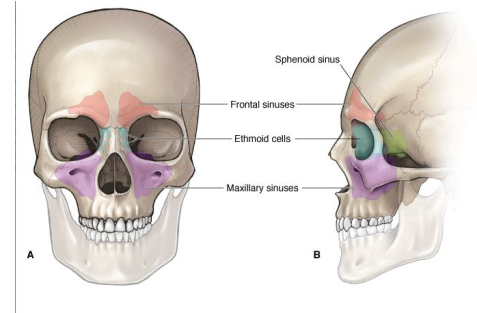


Paranasal sinuses

- They are Air-filled cavities located in the bones around the nasal cavity: ethmoid, sphenoid, frontal & maxillary bones.
- Lined by respiratory mucosa which is continuous with the mucosa of the nasal cavity.
- Drain into the nasal cavity. (Into the recess and meati)

Functions

1. Lighten the skull.
2. Act as resonant chambers for speech. When a person gets an inflamed/blocked sinuses his voice change.
3. Air conditioning: The respiratory mucosa lining the sinuses helps in warming, cleaning and moistening the incoming air.



Paranasal sinuses

The paranasal sinuses are:

1-frontal sinus.

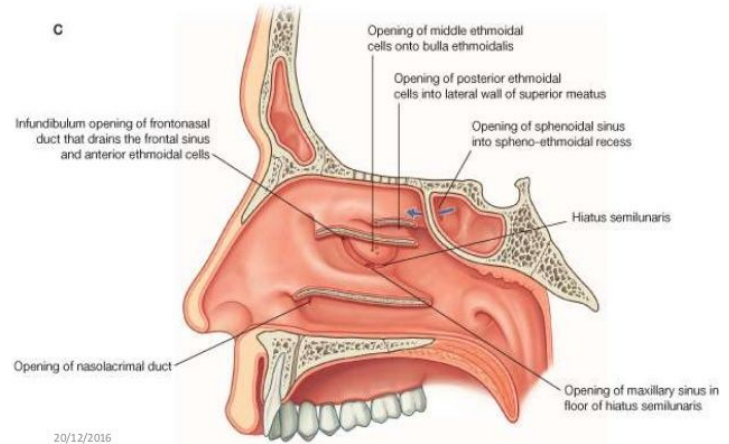
2-Maxillary sinus

3-Sphenoid sinus.

4-Ethmoid sinus (divides into anterior, middle and posterior)

| Opening | sinus |
|-------------------------|--|
| Spheno-ethmoidal recess | sphenoidal sinus |
| Superior meatus | posterior ethmoidal sinus |
| Middle meatus | middle ethmoidal, anterior ethmoidal, maxillary, and frontal sinuses |
| Inferior meatus | nasolacrimal duct. Carries tears from the eyes to the nose. |

Paranasal sinus drainage



Pharynx

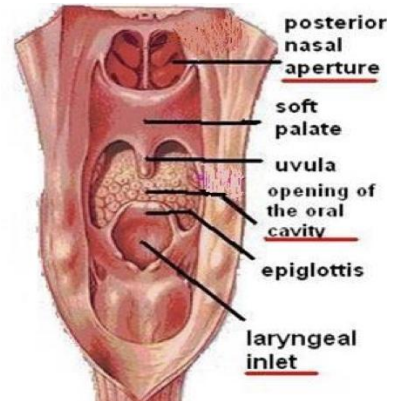
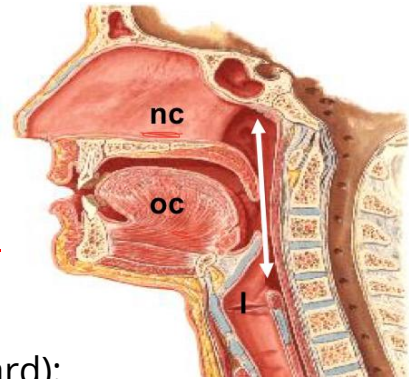
Muscular tube lying behind the nose, oral cavity & larynx.

Extends from the base of the skull to level of the 6th cervical vertebra, where it is continuous with the esophagus.

The anterior wall is deficient and shows (from above downward):

- Posterior nasal apertures. (**Choanae**)
- Opening of the oral cavity.
- Laryngeal inlet.

The muscles arranged in circular and longitudinal layers.



Team436 Explanation: The pharynx is made up of muscles that cover/make up the posterior and lateral walls. But they do not cover the anterior wall that's why it is deficient. Instead the anterior wall is open and connects with the structures listed above.

1-Circular (Constrictor) Muscles

Three in number:

- Superior constrictor.
- Middle constrictor.
- Inferior constrictor.

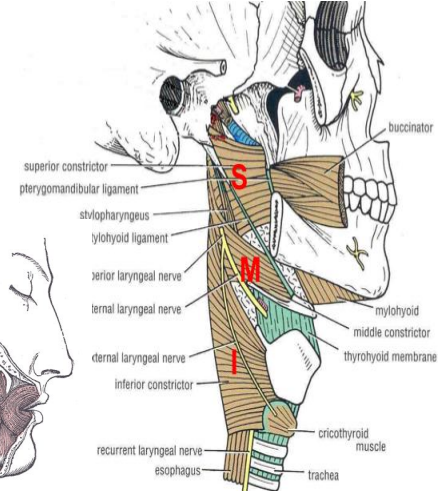
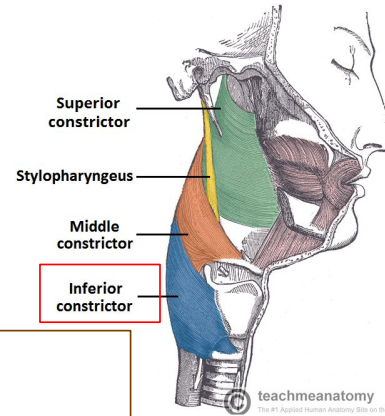
The three muscles overlap each other.

Functions:

1-Propel the bolus* of food down into the esophagus.

2-lower fibers of the inferior constrictor

(Cricopharyngeus) act as a sphincter, preventing the entry of air into the esophagus between the acts of swallowing.



*Bolus: small rounded mass of a substance, especially of chewed food.

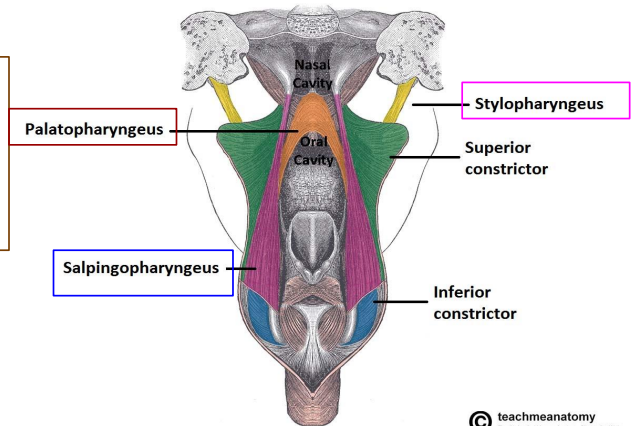
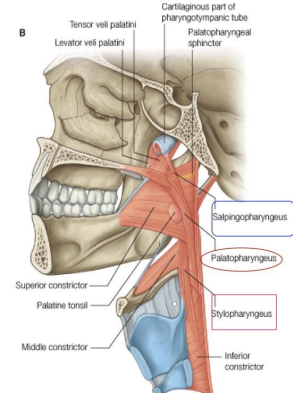
2-Longitudinal Muscles

Three in number:

- **Stylo**pharyngeus
- **Salpingo**pharyngeus
- **Palato**pharyngeus

Function:

Elevate the larynx & pharynx during swallowing



Pharynx is divided into **three** parts:

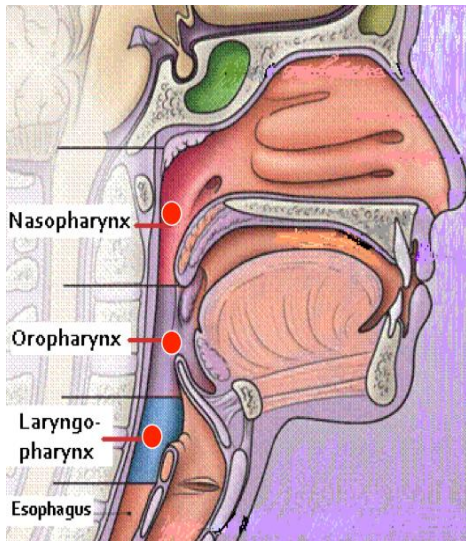
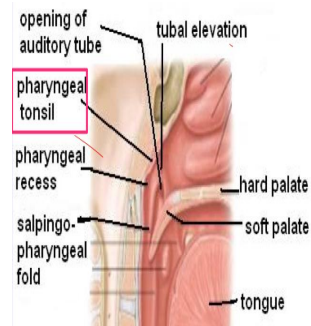
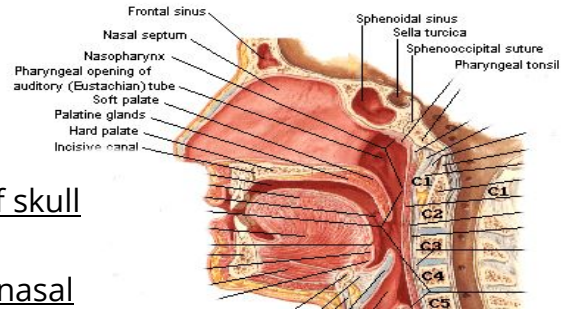
- Nasopharynx.
- Oropharynx.
- Laryngopharynx.

Nasopharynx.

- **Extends** from the base of skull to the soft palate.
- **communicates** with the nasal cavity through **posterior nasal apertures** (choanae)
- Pharyngeal tonsils (Adenoids اللحمية) present in the submucosa covering the roof.

Lateral wall shows:

- Opening of auditory tube.
- Tubal elevation (produced by posterior margin of the auditory tube).
- Tubal tonsil.
- Pharyngeal recess.
- Salpingopharyngeal fold (raised by salpingo-pharyngeus muscle).



Oropharynx.

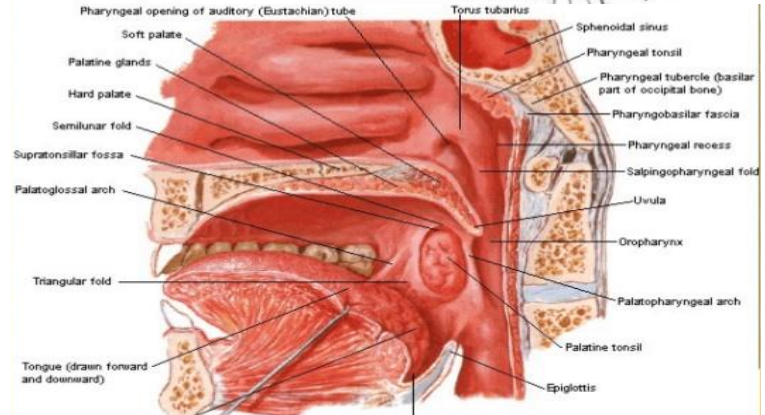
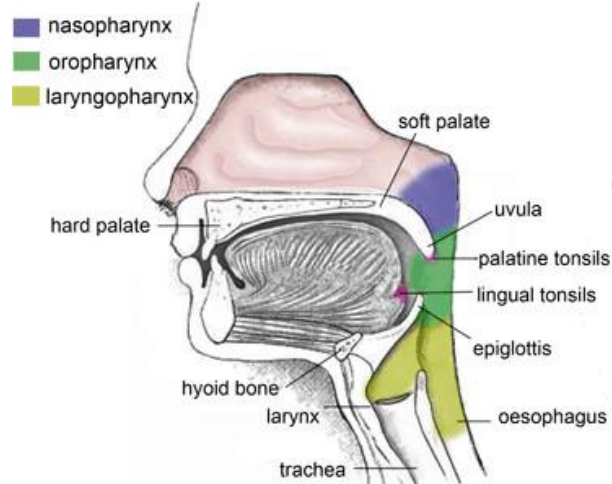
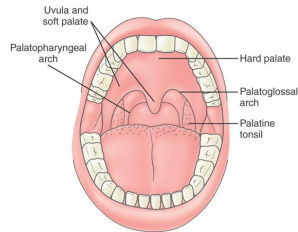
Lies behind the mouth.

communicates with the oral cavity through the **oropharyngeal isthmus**.

Extends from soft palate to upper border of epiglottis.

Lateral wall shows:

- Palatopharyngeal fold.
- Palatoglossal fold
- Palatine tonsil located between them in a depression called the 'tonsillar fossa'.



Palatine tonsils

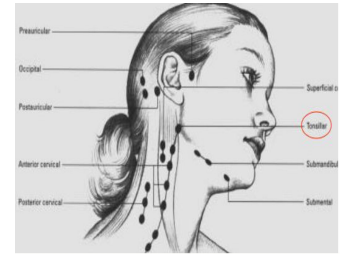
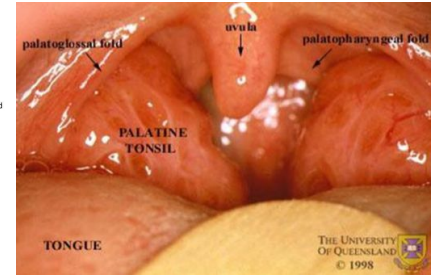
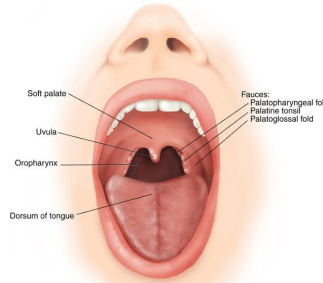
- Two masses of lymphoid tissue
- located in the lateral wall of the oropharynx in the tonsillar fossa

Each one is covered by :

- mucous membrane
- laterally by fibrous tissue (capsule).

It reaches a maximum size during childhood, after puberty it diminishes in size.

“ لان الاطفال مناعتهم اقوى وكل ماكبروا تقل المناعة ”



Arterial supply

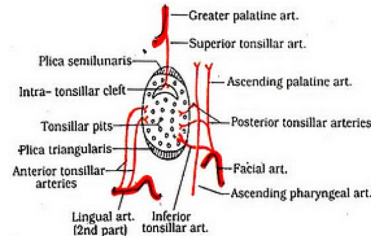
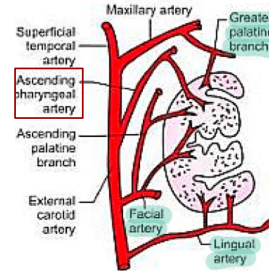
tonsillar artery from the **fascial, lingual, ascending pharyngeal** and **greater palatine**.

Venous drainage

join external palatine, pharyngeal, and fascial veins

Lymphatic drainage

to the upper deep cervical (**jugulodigastric node**)



Relations of Palatine tonsil

Anteriorly: palatoglossal arch

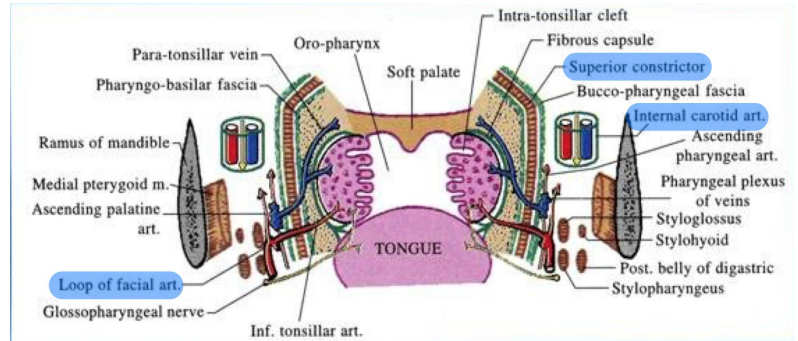
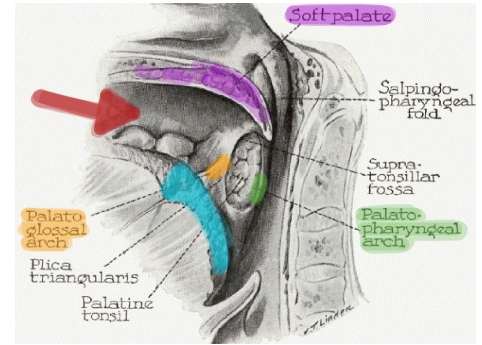
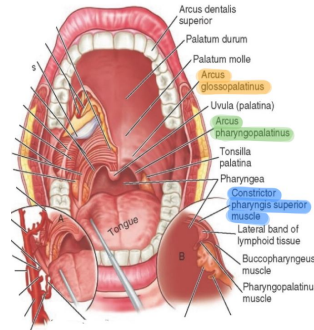
Posteriorly: palatopharyngeal arch

Superiorly: soft palate

Inferiorly: posterior 1/3 of the tongue.

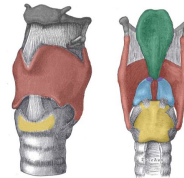
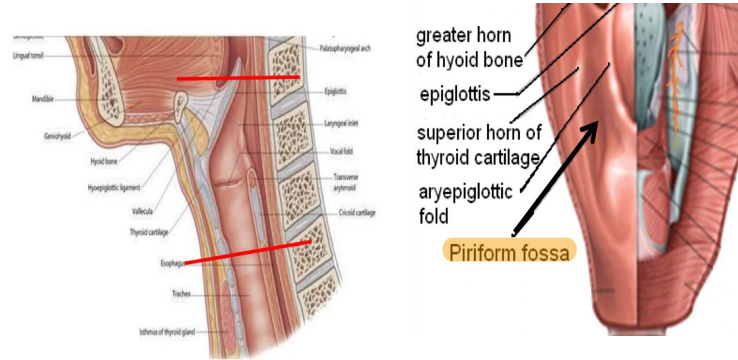
Medially: cavity of the oropharynx

Laterally: (1) superior constrictor of the pharynx separated from it by loose connective tissue through which descends (2) the external palatine vein, (3) loop of the facial artery and (4) the internal carotid artery which lies behind and lateral to the tonsils.

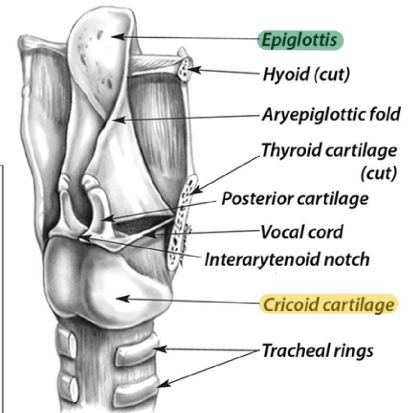


Laryngopharynx.

- Lies behind the laryngeal inlet & the posterior surface of larynx
- communicates with the larynx through the **laryngeal inlet**
- Extends from upper border of **epiglottis** to lower border of **cricoid cartilage**.
- A small depression situated on either side of the laryngeal inlet is called **Piriform Fossa**.
- It is a common site for the lodging of foreign bodies. “مثل لما تبلع الشوك اللي بالسملك”
- Branches of **internal laryngeal** & **recurrent laryngeal** nerves lie deep to the mucous membrane of the fossa and are vulnerable to injury during removal of a foreign body.



Laryngeal inlet



Nerve Supply

Sensory:

- Nasopharynx: Maxillary nerve
- Oropharynx: Glossopharyngeal nerve
- Laryngopharynx: Vagus nerve

All the muscles of pharynx are supplied by the pharyngeal plexus. **Except** ; the Stylopharyngeus is supplied by the glossopharyngeal nerve

The **Veins** drain into **pharyngeal venous plexus**, which drains into the **internal jugular vein**

The **lymphatics** drain into the **deep cervical lymph nodes** either directly, or indirectly via the **retropharyngeal** or **paratracheal lymph nodes**

Arterial supply: from branches of the following arteries.

Ascending pharyngeal

Ascending palatine

Facial

Maxillary

Lingual

MCQs

1)Olfactory mucosa supplied by:

- A)*Olfactory nerve.*
- B)*Maxillary nerve.*
- C)*Ophthalmic nerve.*

2)Which one of the following isn't from paranasal sinuses function:

- A)*Air conditioning.*
- B)*Lighten the skull.*
- C)*smelling.*

3)Muscles that form the walls of the pharynx :

- A)*Circular muscles.*
- B)*Longitudinal muscles.*
- C)*A+B.*

4)Tubal elevation produced by:

- A)*Anterior margin of the auditory tube.*
- B)*Posterior margin of the auditory tube.*
- C)*superior margin of the auditory tube.*

5)Which one of the following is a common site for the lodging of foreign bodies?

- A)*Palatine Tonsil.*
- B)*Epiglottis.*
- C)*Piriform Fossa.*

6)Each half of nasal cavity has:

- A)*Roof, floor, medial & lateral wall.*
- B)*Roof, floor & lateral wall.*
- C)*Roof, medial & lateral wall.*

Answers

- 1)A.
- 2)C.
- 3)C.
- 4)B.
- 5)C.
- 6)A

Team Members

Lamia Abdullah Alkuwaiz (Team Leader)

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Albandari Alshaye
AlFhadah abdullah alsaleem
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Layan Hassan Alwatban
Lojain Azizalrahman
Maha Barakah
Majd Khalid AlBarrak
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Hassan Aloraini
Abdullah Alomar
Fahad Alfaiz
Saad Aloqile
Abdulmajeed Alwardi
Rayyan Almousa
Sultan Alfuhaid
Ali Alammari
Fahad alshughhaithry

Fayez Ghiyath Aldarsouni
Mohammed Alquwayfili
Saleh Almoaiqel
Abdullah Almeaither
Abduljabbar Al-yamane
Sultan Al-nasser
Majed Aljohani
Zeyad
Al-khenaizan
Mohammed Nouri
Abdulaziz Al-drgam
Fahad Aldhowaihy
Omar alyabis
Akram Alfandi
Abdulhaziz Alabdulkareem